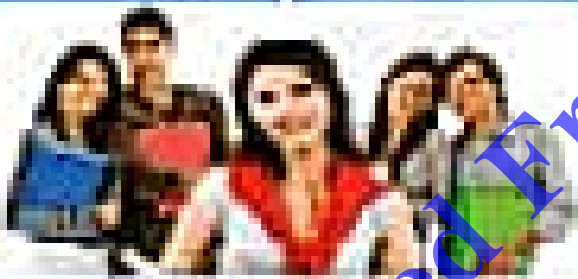




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ENGLISH GRAMMAR & VOCABULARY

CHAPTER 1

ENGLISH GRAMMAR : QUICK REVIEW

There is a general misconception that grammar is threatening and even impossible to understand. It is only because of the way in which it is taught. However, here we provide a simple introduction to what grammar is and how a basic understanding of it can be used to see how it works.

Grammar is the system of a language which describes how a language works. In linguistics, grammar is a set of structural rules that governs the composition of clauses, phrases and words in any given natural language. Grammar may be categorised in two parts.

The rules which define how words are grouped to make sentences. That is called 'Syntax'. Syntax describes why these two sentences have different meanings :

The man slept on the cot.

The cot slept on the man.

The rules which define how words are grouped to fit into sentences. That is called 'morphology'. Morphology describes why these two sentences have different meanings.

The man slept on the cot.

The man sleeps on the cot.

PARTS OF A WORD :

A word can be divided into its STEM (the basic part of the word containing its meaning) and its INFLECTIONS (the endings added to indicate such things as that a noun is PLURAL or a verb is in the past tense).

<i>Examples :</i>	Stem	dog walk
Inflections:		s in dogs ed in walked

PART OF A SENTENCE

SUBJECT :

The subject is the person, thing or topic which the sentence deals with. To discover the subject, ask who or what before the verb, e.g. in the sentence The house stands on the hill, what stands on the hill? Answer: the house.

Examples : The house stands on the hill.
It overlooks the plain.

PREDICATE :

The part of a clause consisting of what is said of the subject, including verb + complement or object.

The predicate is all of the sentence except the subject.

Examples : The house stands on the hill.
It overlooks the plain.

OBJECT :

The object is the person, thing or topic upon which the subject carries out the action of the verb. To discover the object, ask who or what after the verb, e.g. the house overlooks what?

Answer: the plain.

Examples : The house overlooks the plain.
I see him clearly.
He watches himself carefully.

In some cases a whole clause can act as object.

Example : He said that the Green Knight was really orange.

Sometimes we apparently have two objects. Where one of these can alternatively be expressed by placing 'to' before it, it is called the indirect object.

For example, instead of 'He gave me the book' we can say 'He gave the book to me'. Here the book is the direct object and me the indirect object .

COMPLEMENT :

1. A noun phrase or adjective phrase that follows a verb and has the same reference as the subject, e.g. I am owner of this house. The house looked wonderful. Or the same reference as the object, e.g.
He called his servant a fool.
2. A noun phrase that is governed by a preposition, e.g.
He kept it in the almirah. He felt over the moon.
After the verb 'to be' there is no object since the noun which follows refers to the same thing as that which precedes the verb (the subject). The noun following the verb to be is called the complement.

Examples : I am a man.
(here 'man' is the complement)
This is the question.
(here 'question' is the complement)

CLAUSE :

A clause is a group of words normally containing a 'finite verb' and its subject. A main clause makes complete sense and can constitute an entire sentence, e.g.

The train reached at the station on time.

A subordinate clause is one that qualifies a main 'clause' e.g. The train reached at the station on time though it was raining.

There are two kinds of clauses: principal (or main) clauses, and subordinate (or dependent) clauses.

Principal Clause : A group of words which includes a subject and a finite verb and makes a complete statement.

Examples : I am a man.

The house stands on the hill.

When I come home, I will let the cat in.

The following are not principal clauses because they do not make a complete statement which can stand by itself:

Which is a problem

That the house is standing on the hill.

When I come home

The house which stands on the hill.

Subordinate Clause : A group of words which includes a finite or non-finite verb but does not make a statement which can stand by itself.

Examples : As soon as the Green Knight entered the room all were astounded.

He said that the Green Knight was really orange.

The house, which stands on the hill, is empty.

Subordinate clauses can be classified according to their function:

Adverbial Clause :

Example : As soon as the Green Knight entered the room, all were astounded.

In this sentence the clause fulfills the same function as an adverb, such as 'immediately' in the sentence: immediately all were astounded.

Noun Clause :

Examples : He said that the Green Knight was really orange.

The clause fulfills the same function as a noun.

Relative Clause :

Example : The house, which stands on the hill, is empty.

Relative clauses are adjectival in nature. The clause fulfills the same role as an adjective such as 'high-placed' in the sentence, 'The high-placed house is empty'.

Clauses can also be classified by whether they contain a finite verb.

Finite Clause : A finite clause contains a finite verb and, usually, a subject. It can be a principal clause or a subordinate clause.

Examples : They say nice things about you. (principal clause)

When they say nice things about you they are not lying. (subordinate clause)

Non-Finite Clause : A non-finite clause contains a non-finite verb but does not contain a finite verb and cannot stand alone. A non-finite clause cannot be a principal clause. Nonfinite verbs include participles and infinitives.

Examples : Singing and dancing, he moved slowly up the aisle.

He gave me an invitation to bring you to the party.

Having eaten all the cakes, he began to consume the biscuits.

Filled with joy, he left the room.

PHRASE :

A phrase is group of words. Which forms a part of a clause, but which unlike a clause, does not contain a 'finite verb'. Phrases may be categorised as noun, verb adjective, adverb, or prepositional phrases, according to their function within the clause.

Examples : It is on the hill.
He went over the sea.

PART OF SPEECH

Examples :

House	noun
The house	article + noun
The house stands	article + noun + verb
The house stands firmly	article + noun + verb + adverb
The house stands firmly on the hill	article + noun + verb + adverb + preposition + article + noun
The empty house stands firmly on the hill	article + adjective + noun + verb + adverb + preposition + article + noun
It stands on the hill	pronoun + verb + preposition + article + noun
Since it stands on the hill it overlooks the plain	conjunction + pronoun + verb + preposition + article + noun + pronoun + verb + article + noun

NOUN :

Nouns can be thought of as 'names'; they denote things, people, abstract ideas.

Examples : The house is old.

A king was here.

Virtue is its own reward.

Accidents will happen.

ARTICLE :

The articles are: the, a, an. 'The' is called the definite article; 'a' (and an) is called the indefinite article.

VERB :

A verb is a 'doing word'. It expresses the carrying out of an action. With an active verb this action is carried out by the subject.

Examples : It stands.
I am.
He adjudicates between the parties concerned.
Alfred burnt the cakes.

With a passive verb, the action is carried out upon the subject:

Examples : The cakes were burnt by Alfred.
The Bible is read in many languages.

Verbs have various qualities:

Tense : This is the feature of the verb indicating when the action took place

Examples : Present Tense: It stands
Past Tense: It stood
Future Tense: It will stand

Aspect : This is the feature of the verb which indicates whether the action is, was or will be a completed one or a continuous one. If the verb is unmarked as to whether it is completed, 'perfect' or continuous, 'progressive', it is called simple. Hence we can draw up the following scheme:

Simple Present:	It stands
Simple Past:	It stood
Simple Future:	It will stand
Present Perfect:	It has stood
Past Perfect:	It had stood
Future Perfect:	It will have stood
Present Progressive:	It is standing
Past Progressive:	It was standing
Future Progressive:	It will be standing

The present perfect is often known simply as the perfect and the past perfect is sometimes called the pluperfect.

Voice : In English we have the active and the passive voice. In the active voice the subject carries out the action of the verb; in the passive voice the action of the verb is carried out upon the subject.

Examples : Active: I place
Passive: I am placed

A full complement of passive verbs exists in English. The passive is formed with the appropriate tense of the verb to be and the past participle.

Examples : Present Progressive Passive: I am being placed
Past Perfect Passive: I had been placed
Future Perfect Passive: I will have been placed

Mood : There are three moods in English.

1. **Indicative:** The indicative mood is the normal one in present-day English:

Example : I was going to the pictures

2. **Subjunctive:** The subjunctive mood is much rarer; it expresses a hypothetical action.

Examples : If I were going to the pictures.

I wish I were going to the pictures.

3. **Imperative :** The imperative mood expresses an order.

Example : Go to the pictures.

Finite and Non-Finite Verbs : Verbs are either finite or non-finite. Non-finite verbs do not include any indication of tense. One kind of non-finite verb is the infinitive. The infinitive is the basic form of the verb. It is often combined with 'to' as in 'I am going to stand here'. However the infinitive is not always preceded by to: in the sentence. 'I will stand'. Here the infinitive is 'stand'. Combined with 'will' the infinitive stand makes the finite (future tense) verb 'will' stand'. Other non-finite parts of the verb are the participles. The present participle is the form of the verb used in constructions like:

I am going.
He is combing his hair.
They are developing rapidly.

The same form of the verb can also be used as a noun (in which case it is called a gerund or verbal noun):

Examples : Developing is not easy.
Walking is pleasant in the summer.

or as an adjective (in which case it is called a gerundive or verbal adjective):

Examples : The third world is made up of the developing countries.
She is a growing child.

The past participle is used in constructions like:

I have walked.
She has grown.

It has developed into a major argument.

This form is often the same as the past tense (e.g. I walked) but not always (e.g. I grew). This also appears as an adjective:

Example: A grown man

ADVERB :

An adverb modifies a verb; it indicates how the action of a verb is carried out.

Examples : The house stands firmly.
She speaks well.
He dresses beautifully.

It can also modify an adjective or another adverb.

Examples : The house is very firm.
She answered most considerately.

PREPOSITION :

A preposition connects a noun (with or without an article) or a pronoun to some other word. Prepositions are the "little words of English".

Examples : It stands on hills.
The swagman jumped into the billabong.
England is over the sea.
She told the good news to him.

ADJECTIVE :

An adjective qualifies a noun; it describes the attributes of a noun.

Examples : The house stands on the high hill.
Precious purple prose provokes profound professors.

PRONOUN :

Pronouns take the place of nouns.

Examples : It stands on the hill.

I see myself in the mirror.

The house which stands on the hill overlooks the plain.

That stands on the hill.

What stands on the hill?

There are a number of different kinds of pronouns:

Personal Pronouns : These are divided into "persons" as follows:

	Singular	Plural
First person	I	we
Second person	you	you
Third person	he, she, it	they

The personal pronouns also include the reflexive and emphatic pronouns.

These are the same in form but different in function. They are myself, himself, themselves, etc.

Examples :

Reflexive: I see myself.

People help themselves.

Emphatic: I think myself that it is wrong.

They themselves want to stay on.

Relative Pronouns : The relative pronouns are as follows:

	People	Things
Subject	who, that	which, that
Object	whom, that	which, that
Possessive	whose	whose

These are used in relative clauses such as:

Examples : This is the man who saw me.

This is the man whom I saw.

This is the man whose house I saw.

This is the man that I saw.

This is the house that Jack built.

Demonstrative Pronouns : These are :

This > these

That > those

Examples : This is the house.

That is the question.

They are also used as demonstrative adjectives:

Examples : This mango is green.

That house is red.

Interrogative Pronouns : These are used in questions:

	People	Things
Subject	who	what, which
Object	whom, who	what, which
Possessive	whose	

Examples : Who(m) did you see?

Who is that man?

Which is the right way?

Who(m) did you speak to?

What and which can be also used as interrogative adjectives, in which case they can be applied to people.

Examples : Which house stands on the hill?

Which Prime Minister was drowned?

What sweet do you recommend?

CONJUNCTIONS

Some conjunctions are coordinating (i.e. joining elements of the same kind) like 'and', 'or', 'but', etc.

Examples : It stands on the hill and overlooks the plain.

I say this but she says that.

Other conjunctions are subordinating (i.e. joining a subordinate clause to a main clause) like when, because, since, as

Examples : Since it stands on the hill it overlooks the plain.

Although I say this she says that.

When Gawain saw the Green Knight he did not show that he was afraid.

ENGLISH VOCABULARY : QUICK REVIEW

A lot of words are similar but with different meanings. It is almost impossible to avoid making mistakes in English, but if you can get your head around these explanations, you might be able to avoid making these mistakes.

accept vs except

Accept is a verb, which means to agree to take something .

For example: "I always accept good advice."

Except is a preposition or conjunction, which means not including.

For example: "I teach every day except Sunday(s)."

advice vs advise

Advice is a noun, which means an opinion that someone offers you about what you should do or how you should act in a particular situation.

For example: "I need someone to give me some advice."

Advise is a verb, which means to give information and suggest types of action.

For example: "I advise everybody to be nice to their teacher."

affect vs effect

Affect and effect are two words that are commonly confused. affect is usually a verb (action) - effect is usually a noun (thing)

Hint: If it's something you're going to do, use "affect." If it's something you've already done, use "effect."

To affect something or someone.

alone / lonely

Alone can be used as an adjective or adverb. Either use means without other people or on your own.

For example: "He likes living alone."

"I think we're alone now." = There are just the two of us here.

Lonely is an adjective which means you are unhappy because you are not with other people.

For example: "The house feels lonely now that all the children have left home."

a lot / alot / allot

A lot, meaning a large amount or number of people or things, can be used to modify a noun.

For example: "I need a lot of time to develop this website."

It can also be used as an adverb, meaning very much or very often.

For example: "I look a lot like my sister."

It has become a common term in speech; and is increasingly used in writing.

Allot does not exist! There is no such word in the English language. If you write it this way - imagine me shouting at you - "No Such Word!"

Allot is a verb, which means to give (especially a share of something) for a particular purpose:-

For example: "We were allotted a desk each."

all ready vs already

All ready means "completely ready".

For example: "Are you all ready for the test?"

Already is an adverb that means before the present time or earlier than the time expected.

For example: "I asked him to come to the cinema but he'd already seen the film."

or

"Are you buying Christmas cards already? It's only September!"

altogether vs all together

All together (adv) means "together in a single group."

For example: The waiter asked if we were all together.

Altogether (adv) means "completely" or "in total".

For example: She wrote less and less often, and eventually she stopped altogether.

any one vs anyone

Any one means any single person or thing out of a group of people or things.

For example: I can recommend any one of the books on this site.

Anyone means any person. It's always written as one word.

For example: Did anyone see that UFO?

any vs some

Any and some are both determiners. They are used to talk about indefinite quantities or numbers, when the exact quantity or number is not important. As a general rule we use some for positive statements, and any for questions and negative statements.

For example: I asked the barman if he could get me some sparkling water. I said, "Excuse me, have you got any sparkling water?" Unfortunately they didn't have any.

Note - You will sometimes see some in questions and any in positive statements. When making an offer, or a request, in order to encourage the person we are speaking to, to say "Yes", you can use some in a question:

For example: Would you mind fetching some gummy bears while you're at the shops?

You can also use any in a positive statement if it comes after a word whose meaning is negative or limiting:

For example: (a) She gave me some bad advice.

(b) Really? She rarely gives any bad advice.

apart vs a part

Apart (adv) means separated by distance or time.

For example: I always feel so lonely when we're apart.

A part (noun) means a piece of something that forms the whole of something.

For example: They made me feel like I was a part of the family.

been vs gone

been is the past participle of be and gone is the past participle of go.

Been is used to describe completed visits. So if you have been to England twice, you have travelled there and back twice. If you have gone to England, you have not yet returned.

bored vs boring

Bored is an adjective that describes when someone feels tired and unhappy because something is not interesting or because they have nothing to do.

For example: She was so bored that she fell asleep. Boring is an adjective that means something is not interesting or exciting.

For example: The lesson was so boring that she fell asleep.

beside vs besides

Beside is a preposition of place that means at the side of or next to.

For example: The house was beside the Thames.

besides is an adverb or preposition. It means in addition to or also.

For example: Besides water, we carried some fruit. = "In addition to water, we carried some fruit."

borrow vs lend

To lend means to hand out usually for a certain length of time.

Banks lend money.

Libraries lend books.

For example: "My mother lent me some money, and I must pay her back soon."

To borrow means to take with permission usually for a certain length of time.

You can borrow money from a bank to buy a house or a car. You can borrow books for up to 4 weeks from libraries in England.

For example: "I borrowed some money from my mother, and I must pay her back soon."

bought vs brought

Bought is the past tense of the verb to buy.

For example: "I bought a newspaper at the newsagents." brought is the past tense of the verb to bring.

For example: "She brought her homework to the lesson."

by vs until

Both until and by indicate "any time before, but not later than."

Until tells us how long a situation continues. If something happens until a particular time, you stop doing it at that time.

For example: They lived in a small house until September 2003.

(They stopped living there in September.)

I will be away until Wednesday.

(I will be back on Wednesday.)

We also use until in negative sentences.

For example: Details will not be available until January.

(January is the earliest you can expect to receive the details.)

If something happens by a particular time, it happens at or before that time. It is often used to indicate a deadline.

For example: You have to finish by August 31.

(August 31 is the last day you can finish; you may finish before this date.)

We also use by when asking questions.

check (v) vs control (v)

To check means to examine. To make certain that something or someone is correct, safe or suitable by examining it or them quickly.

For example: "You should always check your oil, water and tyres before taking your car on a long trip."

To control means to order, limit, instruct or rule something, or someone's actions or behaviour.

For example: "If you can't control your dog, put it on a leash."

What you shouldn't do is use the verb control in association with people and the work they do.

For example: "I check my students' homework, but I can't control what they do."

come over (v) vs overcome (n)

Come over is a phrasal verb, that can mean several things.

To move from one place to another, or move towards someone.

For example: "Come over here."

To seem to be a particular type of person.

For example: "Politicians often come over as arrogant."

To be influenced suddenly and unexpectedly by a strange feeling.

For example: "Don't stand up too quickly or you may come over dizzy."

Overcome is a verb, which means to defeat or succeed in controlling or dealing with something.

For example: "Using technology can help many people overcome any disabilities they might have."

complement (v) vs compliment (n)

Complement is a verb, which means to make something seem better or more attractive when combined.

For example: "The colours blue and green complement each other perfectly."

Compliment is a noun, which means a remark that expresses approval, admiration or respect.

For example: "It was the nicest compliment anyone had ever paid me."

Tip! Having problems with your spelling?

Try these mnemonics:-

If it complements something it completes it. (With an e.)

I like compliments. (With an i.)

concentrate vs concentrated

The verb - when you concentrate you direct all your efforts towards a particular activity, subject or problem.

For example: You need to concentrate harder when you listen to something in another language.

The adjective - If something is concentrated it means it has had some liquid removed.

For example: I prefer freshly squeezed orange juice to concentrated.

council vs counsel

Council is a group noun. It refers to a group of people elected or chosen to make decisions or give advice on a particular subject, to represent a particular group of people, or to run a particular organization.

For example: "The local council has decided not to allocate any more funds for the project."

Counsel can be a verb, which means to give advice, especially on social or personal problems.

For example: "She counsels the long-term unemployed on how to get a job."

Counsel can also be a noun, which means advice and can also mean a lawyer.

For example: "I should have listened to my father's counsel, and saved some money instead of spending it all."

Example of lawyer: The defence counsel pressed his case

councillor vs counsellor

Councillor is a noun which means an elected member of a local government.

For example: "He was elected to be a councillor in 1998."

Counsellor is a noun, which means someone who is trained to listen to people and give them advice about their problems.

For example: "The student union now employs a counsellor to help students with both personal and work-related problems."

data vs datum

This isn't so much a common mistake as a common cause for arguments (as is often the case with words of Latin origin).

The dictionaries treat data as a group noun, meaning information, especially facts or numbers, collected for examination and consideration and used to help decision-making, or meaning information in an electronic form that can be stored and processed by a computer.

Then they go on to confuse matters by giving the following kind of example :

The data was/were reviewed before publishing.

So, which is it, was or were? Strictly speaking 'datum' is the singular form and 'data' is the plural form.

If you're writing for an academic audience, particularly in the sciences, "data" takes a plural verb.

HOMOPHONES :

Homophones are words that have exactly the same sound (pronunciation) but different meanings and (usually) different spelling.

For example, the following two words have the same sound, but different meanings and spelling:

hour and our

In the next example, the two words have the same sound and spelling, but different meanings:

bear (the animal)

bear (to carry)

Usually homophones are in groups of two (our, hour), but very occasionally they can be in groups of three (to, too, two) or even four. If we take our "bear" example, we can add another word to the group:

bare (naked)

bear (the animal)

bear (to tolerate)

HOMOPHONES AND HOMOGRAPHS :

Homonyms generally include two categories of word types: homophones and homographs.

Homographs are words that are spelled the same but have different meanings.

Homophones are words that sound the same when you pronounce them, but have different meanings.

This list contains both homophones and homographs.

ade – drink type, as in lemonade

aid – to help or assist

aide - assistant

affect - change

effect – result or consequence

air – atmosphere (the stuff we breathe)

err – to make a mistake

aisle - walkway

I'll – I will

isle - island

allowed - permitted

aloud – out loud

ant – picnic pest (Also an insect living in organized colonies)

aunt – relative, as in your mom's sister

arc - curve

ark – Noah's boat

ate – chewed up and swallowed

eight – number after seven

bare - uncovered

bear – grizzly animal

berry – fruit from a bush

bury – to put underground

base – bottom part

bass – deep or low

be – to exist

bee – buzzing insect

beach – sandy shore

beech – type of tree

beat - to pound

beet – type of edible plant

berth – tie up

birth – to be born

bite - nibble

byte – 8 bits (computer data)

blew – past of blow

blue – color of ocean

boar - pig

bore – not interesting bore - to drill

borough – area or district

burrow – dig through

burro – small donkey

bough - branch

bow – bend or curtsy

buoy - floater

boy – young man

brake – stop pedal

break – smash

bread – bakery food

bred – form of breed

broach - mention

brooch - pin

brows - eyebrows

browse – look around

buy - purchase

by - beside

by - originating from,

bye – short for goodbye

cell – compartment

sell - vend

cent – penny coin of USA

sent – past form of send

cereal – breakfast food

serial - sequential

Chile – country in South America

chili – bean stew

chilly – frosty

chord – musical tone

cord - rope

cite - quote

site - location

sight - view

close – opposite of open

clothes - clothing

complement – enhance; go together

compliment - praise

council - committee
 counsel - guidance
 creak - squeak
 creek - stream of water
 crews - gangs
 cruise - ride on a boat
 dear - darling
 deer - woodland animal
 dew - morning mist
 do - operate
 due - payable
 die - cease to exist
 dye - color
 doe - female deer
 dough - a flour mixture with water
 dual - double
 duel - battle
 ewe - female sheep
 you - second-person personal pronoun
 eye - sight organ
 I - me
 fair - equal
 fare - price
 fairy - elflike creature with wings
 ferry - boat
 faze - impact
 phase - stage
 feat - achievement
 feet - plural of foot
 fir - type of tree
 fur - animal hair
 flea - small biting insect
 flee - run
 flew - past form of fly
 flu - illness
 flour - powdery, ground up grain
 flower - blooming plant
 for - on behalf of
 fore - front
 four - one more than three
 forth - onward
 fourth - number four
 knew - past form of know
 new - not old
 gorilla - big ape
 guerrilla - warrior
 grease - fat
 Greece - country in south eastern Europe
 groan - moan
 grown - past participle form of grow
 hair - head covering
 hare - rabbit-like animal

hall - passageway
 haul - tow
 halve - cut in two parts
 have - possess
 hay - animal food
 hey - interjection to get attention
 heal - mend
 heel - back of foot
 hi - hello
 high - up far
 hoarse - croaky
 horse - riding animal
 hole - opening
 whole - entire
 holey - full of holes
 holy - divine
 wholly - entirely
 hour - sixty minutes
 our - belonging to us
 knead - massage or make uniform
 need - desire
 knight - feudal horseman
 night - evening
 knot - tied rope
 not - negative
 know - have knowledge
 no - opposite of yes
 lead - metal
 led - was the leader
 lessen - make smaller
 lesson - class
 loan - lend
 lone - solitary
 made - past form of make
 maid - servant
 mail - postage
 male - opposite of female
 marry - to wed
 merry - very happy
 meat - animal protein
 meet - to be in the same place
 none - not any
 nun - woman who takes special vows
 oar - boat paddle
 or - introduces an alternative
 ore - mineral
 oh - expression of surprise or awe
 owe - be obligated
 one - single
 won - past form of win
 overdo - do too much

overdue – past due date
pail - bucket
pale – not bright
pain - hurt
pane – window glass
peace - calm
piece - segment
peak – highest point
peek - glance
plain - ordinary
plane – flight machine
plane - flat surface
pole - post
poll - survey
poor – not rich
pour – make flow, cause to run
pray – implore God
prey - quarry
principal – most important
principle - belief
rain – water from sky
rein - bridle, any means of control
rap - tap
wrap – drape around
real - factual
reel - roll
right – correct; not left
write - scribble
ring - encircle
wring - squeeze
role - function
roll - rotate
rose - flower
rows - lines
sail – move by wind power
sale – bargain price
scene - landscape
seen - viewed
sea – ocean segment
see – observe with eyes
seam – joining edge
seem - appear
sew – connect with thread

so – as a result
sow - plant
soar - ascend
sore – hurt place, causing misery, pain
sole - single
soul - essence, a human being
some – a few
sum - amount
steal - swipe
steel - alloy
tail – animal's appendage
tale - story
their – belonging to them
there – at that place
they're – they are
to - toward
too - also
toe – foot appendage
tow – pull along
vary - differ
very - much
wail - howl
whale – huge swimming mammal
waist – area below ribs
waste - squander
wait – kill time
weight – measurable load
war - battle
wore – past form of wear
warn - caution
worn - used
way - path
weigh – measure mass
we - us
wee - tiny
weak – not strong
week – period of seven days
weather - climate
whether - if
which - that
witch – sorcerer
your – belonging to you
you're – you are

EXERCISE 1

Common Errors

DIRECTIONS (Qs. 1 - 65) : A sentence has been broken into 4 parts, (a), (b), (c) and (d). Read each sentence to find out whether there is any grammatical error in it. The error, if any, will be in one part of the sentence. The letter of that part is the answer. If there is no error, the answer is 'e'. (Ignore the errors of punctuation, if any).

1. (a) The interviewer asked the actress
(b) how could she
(c) manage to attain fame
(d) in a short period.
(e) No error.
2. (a) He has a scheme (b) of his own which he thinks
(c) more preferable to (d) that of any other person.
(e) No error.
3. (a) The historian (b) has been working
(c) on the project (d) from last 12 years.
(e) No error.
4. (a) We now look forward for
(b) some great achievements
(c) which to some extent
(d) can restore the country's prestige once again.
(e) No error.
5. (a) We play (b) tennis together
(c) every morning (d) since last June.
(e) No error.
6. (a) In spite of his (b) being a Quiz Master
(c) show was (d) a big flop.
(e) No error.
7. (a) Our school is making
(b) every possible effort
(c) to provide best facilities
(d) and personal attention for each child.
(e) No error.
8. (a) At last the rain ceased (b) and the sky was
(c) cleared by clouds (d) and lightening.
(e) No error.
9. (a) You may not always
(b) get whatever you deserve
(c) but that does not belittle
(d) the importance for your work.
(e) No error.
10. (a) The committee is thankful to Shri Desai
(b) for preparing not only the main report
(c) but also for preparing
(d) the agenda notes and minutes.
(e) No error.
11. (a) We have observed that
(b) many good programmes
(c) suffer of shortage
(d) of funds and other resources.
(e) No error.
12. (a) The apparently obvious solutions
(b) to most of his problems
(c) were overlook by
(d) many of his friends.
(e) No error.
13. (a) Do not trouble (b) yourself about writing to me
(c) unless you are quite (d) in the humour for it.
(e) No error.
14. (a) Usually
(b) the climate in mountainous areas becomes much
(c) windy
(d) at higher altitudes.
(e) No error.
15. (a) The Head of the Department
(b) advised all the staff
(c) to not to
(d) indulge in gossip.
(e) No error.
16. (a) As it was Ramesh's
(b) first interview he dressed him
(c) in his most
(d) formal suit.
(e) No error.
17. (a) Developmental activities of
(b) the government come
(c) to a standstill due
(d) to paucity of funds.
(e) No error.
18. (a) I was to about (b) go out of my house
(c) when it suddenly (d) started raining.
(e) No error.
19. (a) While Mahendra was away
(b) on a long official tour
(c) his office receive an important letter
(d) which was marked 'Urgent'.
(e) No error.
20. (a) Rajesh was expecting
(b) a telegram from his uncle
(c) which would inform
(d) him whether he went or not.
(e) No error.

21. (a) The teacher promised
(b) that he will explain it
(c) if they come
(d) before school the following day.
(e) No error.
22. (a) Scarcely had
(b) he gone a few steps
(c) that he was told
(d) that his mother was no more.
(e) No error.
23. (a) One of the objective (b) of the meeting which
(c) was held today was to
(d) elect new office-bearers.
(e) No error.
24. (a) When the national (b) anthem was being
(c) sung, everyone were (d) standing in silence.
(e) No error.
25. (a) He neglects
(b) attending lectures
(c) regularly
(d) though college was only a few yards away from his house.
(e) No error.
26. (a) Mr.Raman said that
(b) he had a difference
(c) with
(d) the chairman at his statement.
(e) No error.
27. (a) We were shocking (b) to hear the news
(c) of the untimely death (d) of the leader.
(e) No error.
28. (a) The health workers are
(b) being tried their best
(c) to popularise
(d) preventive measures.
(e) No error.
29. (a) After listening to (b) his advice, I
(c) decided to not to (d) go abroad for studies.
(e) No error.
30. (a) The customer scarcely had
(b) enough money to pay
(c) to the cashier
(d) at the cash counter.
(e) No error.
31. (a) Neither of the plans (b) suits him and therefore
(c) he decided not to (d) go out yesterday.
(e) No error
32. (a) Since I had been gone
(b) through the book
(c) long back, I could
(d) not remember the contents.
(e) No error.
33. (a) What (b) you will think
(c) if school boys (d) make fun of you?
(e) No error.
34. (a) We (b) have been living
(c) in this house (d) since two years.
(e) No error.
35. (a) He served (b) the country with
(c) heart and soul (d) but got nothing in return.
(e) No error.
36. (a) Manohar has not only opened
(b) a restaurant, but also
(c) a grocery shop in the
(d) village where we live
(e) No error.
37. (a) His speech was
(b) judged by many
(c) as one of the most important speech
(d) given in the function.
(e) No error.
38. (a) They would not (b) have able to plan
(c) the details of the job. (d) if you had no cooperated.
(e) No error.
39. (a) Hardly had I (b) entered the compartment
(c) than I met (d) my friend Vishwas.
(e) No error.
40. (a) Unintentionally I let (b) out the secret
(c) by talking about (d) it loudly in the library.
(e) No error.
41. (a) Ever since the government
(b) announced its new policy
(c) the private institutions had
(d) run into heavy weather.
(e) No error.
42. (a) Ramesh did not like
(b) leaving his old parents alone in the house
(c) but he had no alternative
(d) as he has to go out to work.
(e) No error.
43. (a) Both the brothers are
(b) so good-natured that
(c) they look at their
(d) old and aged parents very well
(e) No error.
44. (a) Foolishly Rajani opened
(b) the cooker when
(c) it was full steam
(d) and burnt her hands.
(e) No error.
45. (a) No sooner did
(b) the chairman begin speaking
(c) some participants started
(d) shouting slogans.
(e) No error.

46. (a) He fixed a metal ladder
(b) for the wall below his window
(c) so as to be able to
(d) escape if there was a fire.
(e) No error.
47. (a) Jayant told me
(b) that Mihir expect
(c) every friend to meet him
(d) once in a week.
(e) No error.
48. (a) I am trying to finish
(b) this letter for the last one hour
(c) I wish you would
(d) go away or stop disturbing me.
(e) No error.
49. (a) If you would have
(b) gone to his house
(c) before 10 a.m., you would have
(d) got his autograph.
(e) No error.
50. (a) The five-member committee were
(b) of the view that the present service conditions
(c) of the employees of this company
(d) are quite good.
(e) No error.
51. (a) Jayesh loved his Guru immensely
(b) and gave him fullest loyalty,
(c) yet he had his own
(d) independent way of thinking.
(e) No error.
52. (a) Day in and day out (b) he keep telling
(c) his friends that (d) he wants to go abroad.
(e) No error.
53. (a) The chairman welcomed
(b) all the guests and
(c) gave an outline of the
(d) activities performing by the Company.
(e) No error.
54. (a) Their only demand
(b) for additional wages were
(c) considered sympathetically
(d) by the progressive management.
(e) No error.
55. (a) Your machine would not have
(b) given you so much trouble
(c) if you had
(d) maintained it proper.
(e) No error.
56. (a) Even though it was (b) raining bad I
(c) went out to (d) get some medicines.
(e) No error.
57. (a) Rosy herself wash (b) all the clothes and
(c) never gives them (d) to the laundry.
(e) No error.
58. (a) Pramod said that (b) he prefers a white shirt
(c) to coloured one (d) on any festival occasion.
(e) No error.
59. (a) Whatever work (b) that which you undertake
(c) put your best (d) efforts in it.
(e) No error.
60. (a) If you cannot (b) sympathy with the poor,
(c) how will you be (d) able to do social work?
(e) No error.
61. (a) The majority of the
(b) computer professionals recommends
(c) that effective measures
(d) should be taken against software piracy.
(e) No error.
62. (a) Very few employees (b) in our company are
(c) so dedicated as (d) Mahesh will.
(e) No error.
63. (a) A detailed inquiry (b) in the incident
(c) has been initiated (d) by the Central Government.
(e) No error.
64. (a) What is needed today is
(b) a new breed of managers
(c) with a new set of concepts
(d) and a flexible way about thinking.
(e) No error.
65. (a) They have been (b) very close friends
(c) until they quarrelled. (d) No error.
(e) No error.

Directions (Qs. 66 - 116) : A sentence is broken into 3 parts (a), (b) and (c). Read each sentence to find out any grammatical error in it. The error if any will be in the part of the sentence the letter of that part is the answer. If error is in more than one part of the sentences your answer will be(e)

66. (a) The serial which appeared quite interesting initially
(b) turned out to be boring
(c) in its latter parts
(d) No error.
67. (a) It is the duty of every citizen to do his utmost
(b) to defend the hardly-won
(c) freedom of the country.
(d) No error.
68. (a) If a man diligently seeks to come into the contact
(b) with the best that has been thought and said in this world
(c) he will become simple and unselfish.
(d) No error.
69. (a) You must (b) remember me
(c) to post this letter. (d) No error.

70. (a) On the busy Ring Road
(b) we witnessed a collusion
(c) between a truck and an auto
(d) No error.
71. (a) He couldn't but help
(b) shedding tears at the plight of the villagers
(c) rendered homeless by a devastating cyclone.
(d) No error.
72. (a) The brand proposition now therefore had to be that Keokarpin Antiseptic Cream is more effective
(b) because it penetrates deepdown (being light and non-sticky)and works from within
(c) (because of its ayurvedic ingredients) to keep skin blemish, free and helps cope with cuts nicks, burns and nappy rash
(d) No error
73. (a) My papa is (b) in bad mood
(c) today (d) No error.
74. (a) In spite of several reminders,
(b) he did not so far send
(c) any reply to my letters.
(d) No error.
75. (a) Please try to understand
(b) that the dispute on this issue is between my brother and myself,
(c) and concerns nobody else.
(d) No error.
76. (a) It does not matter how you do it;
(b) what I want is that
(c) you should finish the work within a month.
(d) No error.
77. (a) While walking slowly in the park
(b) on a quiet summer afternoon
(c) a mad dog suddenly attacked him from behind.
(d) No error.
78. (a) Many health-conscious people
(b) prefer margarine
(c) than butter.
(d) No error.
79. (a) At present juncture
(b) however, the supercomputer
(c) would be a costly toy.
(d) No error.
80. (a) Troy was taken by Greeks
(b) this formed the basis of a story
(c) which has become famous.
(d) No error.
81. (a) The method suggested in the lecture
(b) enables a student to learn more quickly
(c) and to have remembered for a longer period of time.
(d) No error.
82. (a) The test will not need
(b) more than one and half hour
(c) to finish.
(d) No error.
83. (a) His father died of cholera
(b) but his mother also,
(c) though very weak, is out of danger.
(d) No error.
84. (a) I am thinking of
(b) to go to Agra
(c) for my cousin's marriage.
(d) No error.
85. (a) Neeraj said
(b) that he would rather fail than copying
(c) in the examination.
(d) No error.
86. (a) You will come (b) to my party tomorrow,
(c) isn't it? (d) No error.
87. (a) Both of you two (b) can come with me
(c) to the play tonight (d) No error.
88. (a) No sooner did the sun rise
(b) when we took a hasty breakfast
(c) and resumed the journey.
(d) No error.
89. (a) The brakes and steering failed
(b) and the bus ran down the hill
(c) without anyone being able control it.
(d) No error.
90. (a) When he was asked what is wrong with him.
(b) he said that he was not well
(c) and asked for leave of absence for one day.
(d) No error.
91. (a) Remember that you are part of
(b) the team and your success depends on the support
(c) you are able to give and get from your other team members.
(d) No error.
92. (a) Happily, zoos were (b) unwilling to cooperate
(c) in a scheme that was potentially harmful to animal welfare.
(d) No error.
93. (a) With little patience (b) you will be able to
(c) cross this hurdle. (d) No error.
94. (a) None of the students attending your class
(b) answered your questions
(c) did they?
(d) No error.
95. (a) An animal
(b) can be just as unhappy in a vast area
(c) or in a small one.
(d) No error.

96. (a) The scientist must follow
(b) his hunches and his data
(c) wherever it may lead.
(d) No error.
97. (a) A large scale of exchange of nuclear weapons
(b) will produce unprecedented amounts of radiation
(c) that can penetrate into the biological tissue.
(d) No error.
98. (a) He asked me (b) why did I call
(c) him a rogue. (d) No error.
99. (a) The person which was
(b) recommended for the position
(c) did not fulfil the prescribed qualifications.
(d) No error.
100. (a) Sheela has scored a first class
(b) in her final exams,
(c) isn't it? (d) No error.
101. (a) He gave them no money
(b) nor did help them
(c) in any way.
(d) No error.
102. (a) My wife has got (b) a new job
(c) a month ago. (d) No error.
103. (a) A group of friends (b) want to visit
(c) the new plant as early as possible.
(d) No error.
104. (a) When I get a cold
(b) it takes me weeks
(c) to shake it off.
(d) No error.
105. (a) There is still (b) little tea
(c) left in the cup. (d) No error.
106. (a) After opening the door
(b) we entered into the room
(c) next to the kitchen.
(d) No error.
107. (a) Last month we celebrated
(b) the wedding of our sister for whom
(c) we have been looking for a suitable alliance for three years.
(d) No error.
108. (a) I am sure that all my monthly expenses
(b) would exceed the income
(c) if I do not economic.
(d) No error.
109. (a) Having read a number of stories
(b) about space travel
(c) his dream now is about to visit the moon.
(d) No error.
110. (a) It is easy to see that
(b) a lawyer's demeanour in court
(c) may be prejudicial against the interests of his client.
(d) No error.
111. (a) She walked in
(b) the room where the murder
(c) had taken place.
(d) No error.
112. (a) The ways of
(b) travelling has changed
(c) dramatically since
(d) the late nineteenth century
(e) No error.
113. (a) I could not convince them
(b) because they persisted to suggest
(c) that I was lying.
(d) No error.
114. (a) It is difficult (b) for anyone
(c) to past time thus. (d) No error
115. (a) Myself and Gopal (b) will take care of
(c) the function on sunday.
(d) No error.
- DIRECTIONS (Qs. 116–130): Read each sentence to find out whether there is any grammatical error or idiomatic error in it. The error, if any, will be in one part of the sentence. The letter of that part is the answer. If there is no error; the answer is (e). (Ignore errors of punctuation, if any.)**
116. It is only now, (a) / sixty years after independence, that (b) / India is learning how to negotiating (c) / the competing demands of power and justice. (d) No error (e)
117. The graceful folk dance had performed (a) / so beautifully by a dance group that nobody (b) / seemed to notice that (c) / the show was two-and-a-half hours long ! (d) No error (e)
118. The actor, that was (a) / busy meeting and greeting people, (b) / made sure that this day became (c) / an extra special one for his parents. (d) No error (e)
119. Farmhouse owners in the city, (a) / who were till now paid property tax (b) / for only the built-up area of the plot, will soon (c) / have to pay tax to the government for vacant land also. (d) No error (e)
120. A time sheet diary is to be (a) / maintained by every actor, since (b) / producers constantly complain that they are (c) / forced shooting for late hours because actors come very late. (d) No error (e)
121. Injected into the blood, (a) / tiny bubbles of gas can ease (b) / the passage of vital stroke drugs into the brain, (c) / helping in prevent damage to the grey matter. (d) No error (e)
122. Since universities have more (a) / space on their campuses, they (b) / have been asked to open fire detection control rooms (c) / as a mandatory measure. (d) No error (e)
123. District police arrested (a) / a gang of notorious robbers (b) / who were planning to strike at (c) / a house in the vicinity. (d) No error (e)
124. Households across the State are either opting for (a) / a more modest lifestyle or compromising on (b) / the nutritional value of their food in efforts to negate (c) / the price rise of essential commodities, cereals, vegetables and fruits. (d) No error (e)

125. The fire that gutted (a) / years for research in the chemistry and biochemistry labs (b) / of the University building was (c) / due to short circuit. (d) No error (e)
126. If your don't (a) / understand any of these words (b) / you could (c) / always refer a dictionary. (d) / No error (e)
127. Tea is so hot (a) / that she (b) / can (c) / take it. (d) / No error (e)
128. The teacher said (a) / that the earth (b) / moves round (c) / the sun. (d) / No error (e)
129. He told to me (a) / that he (b) / was going away (c) / the next day. (d) / No error (e)
130. The lecturer says (a) / that Solomon won the respect (b) / of all races and (c) / classes by his justice. (d) / No error (e)

Directions (Qs. 131-135) : In each sentence below four words have been printed in bold type, which are numbered (a), (b), (c), (d). One of these words may be either wrongly spelt or inappropriate in the context of the sentence. The number of that word is the answer. If all the four words are spelt correctly, the answer is (e), i.e., all correct.

131. He had experienced (a) / a purposefully (b) / discussion (c) / on topics of our interest. (d) / All correct (e)
132. To solve a (a) / problem, one needs to have (b) / intelligent and firm (c) / determination. (d) / All correct (e)
133. Many legends (a) / superstitions endow the moon with (b) / a beauty and mystery which will (c) / linger for countless years. (d) / All correct (e)
134. People in our country are distressed (a) / by the spate of strikes, an almost (b) / perpetual go-slow and (c) / incredibly low productivity. (d) / All correct (e)
135. The faces of the (a) / twins were so (b) / identical that we could not (c) / differentiate between them. (d) / All correct (e)

Directions—(Q. 136 to 145) Read each sentence to find out whether there is any grammatical error or idiomatic error in it. The error, if any, will be in one part of the sentence. The letter of that part is the answer. If there is 'No error', the answer is (e). (Ignore errors of punctuation, if any.)

136. In about five minutes, they would (a) / cover the distance from the road to the point (b) / where the waves would (c) / begin lick their feet. (d) No error (e)
137. The devastating experiences (a) / of many wars taught some countries (b) / the necessary of pursuing peace (c) / at the expense of nationalist egos. (d) No error (e)
138. The former superstar recently (a) / visit an orphanage, (b) / fuelling speculation that (c) / she is planning to adopt a child. (d) No error (e)
139. According to a new study (a) / taking steps to remain healthy and young (b) / may help delay (c) / the onset of Alzheimer's disease. (d) No error (e)
140. A day after he was diagnosed with (a) / swine flu, preventive measures were put in place (b) / to ensure that others were not (c) / affected by the dreaded virus. (d) No error (e)
141. The administration has conclusive (a) / that it is retailers who are (b) / responsible for upsetting (c) / the city's household budget. (d) No error (e)
142. The assurances, unfortunately, (a) / remained on paper, as (b) / neither the Centre or the state initiated steps (c) / for the development of the backward region. (d) No error (e)
143. Sediment deposit along the coast (a) / may be the primary reason for (b) / the change in conditions, (c) / but a lot more remains to be understand. (d) No error (e)
144. A committee will be set up (a) / to explore pros and cons by (b) / a common fee structure, and will (c) / take a final decision on it within a week. (d) No error (e)
145. The infection which causes (a) / gums to bleed and teeth to fall out (b) / results from the build-up of (c) / a particular bacteria that is common to most mouths. (d) No error (e)
- Directions (Q. 146–193)** Read each sentence to find out whether there is any grammatical error in it. The error, if any, will be in one part of the sentence. The letter of that part is the answer. If there is no error, the answer is (e) i.e. 'No error'. (Ignore the errors of punctuation, if any.)
146. Jason sell his house and (a) / moved to a flat (b) / because it was (c) / expensive to maintain. (d) No error (e)
147. He accepted the offer (a) / because there was (b) / nothing more better (c) / coming his way. (d) No error (e)
148. Most villages were cut off (a) / from the rest of (b) / the country (c) / owing heavy floods. (d) No error (e)
149. The trainer revised (a) / his work thorough (b) / so that no one (c) / could find fault with it. (d) No error (e)
150. The band will play (a) / the National Anthem when (b) / the President arrives (c) / on the country. (d) No error (e)
151. If you are (a) / caught stealing (b) / in the super market, (c) / you will be fined. (d) No error (e)
152. They left very early (a) / for the station (b) / for fear that they might (c) / be held up on traffic. (d) No error (e)
153. By the time the (a) / fire engine arrived (b) / at the scene, (c) / the building had already collapsing. (d) No error (e)
154. Gloria and Fiona (a) / are always in (b) / a state of disagreement (c) / for one another. (d) No error (e)
155. The man which stole the camera (a) / hid it in his home (b) / until he could safely (c) / get it out of town. (d) No error (e)
156. When we (a) / reached the shops, (b) / we find that (c) / they were all closed. (d) No error (e)
157. Poor people (a) / has no money (b) / therefore they cannot afford (c) / proper medical facilities. (d) No error (e)
158. The course is for (a) / anyone who is interested (b) / in learning (c) / about computers. (d) No error (e)
159. We were surprised (a) / that she participated (b) / at the performance (c) / held at NCP(a) (d) No error (e)
160. As soon as (a) / I getting my (b) / first salary (c) / I spent all my money. (d) No error (e)
161. The principal (a) / introducing me (b) / to some of her (c) / teaching staff. (d) No error (e)
162. The doctors said that (a) / he was making good progress (b) / and would not (c) / need an operation. (d) No error (e)
163. Instead of (a) / to buy books, (b) / I borrow them (c) / from the library. (d) No error (e)

164. By the times (a) / we reached the classroom, (b) / the lecture had (c) / already begun. (d) No error (e)
165. The Indian government (a) / should make sure that (b) / men and women are (c) / given equal opportunities. (d) No error (e).
166. The bus (a) was hired (b) by (c) the ladies for its picnic (d). No error (e).
167. Removing seeds from (a) / cotton plants was (b) / a slowest job until (c) / Eli Whitney invented the cotton gin. (d) No Error (e)
168. India is a land of (a) / great political leaders (b) / who ruled the country effectively (c) / and also by protecting its national interest . (d) No Error (e)
169. The climbers will try again (a) / to reach the summit of the mountain, (b) / their chances of doing so are (c) / more better than they were last week. (d) No Error (e)
170. Most birds sings (a) / only in daylight, (b) / one notable exception (c) / being the nightingale. (d) No Error (e)
171. In the eve of the election (a) / there was heavy (b) / political security (c) / in the state. (d) No Error (e)
172. The teacher thought (a) / the children would (b) / be happy for (c) / clearing away their toys. (d) No Error (e)
173. Banglore is a beautiful city (a) which in (b) people have successfully blended (c) the moderm with (d) the traditional. No error (e).
174. Neither Alice or Mary remembers (a) / what happened before (b) / the car crashed (c) / into the wall. (d) No Error (e)
175. This is the woman (a) / that always wears (b) / a black shawl (c) / to work. (d) No Error (e)
176. Many leading members (a) / of the opposition party (b) / has tried to justify (c) / their decisions. (d) No Error (e)
177. The view of (a) / the manufacturing and (b) / tourist industries is that (c) / the economy is improving. (d) No Error (e)
178. The economist (a) was hesistant (b) to comment (c) on the government policy. (d) All Correct (e)
179. The king knew (a) that he had definitely (b) been wrong about his choice (c) of courtiers. (d) All Correct (e)
180. Statistics (a) are now compulsory (b) for all students taking a course (c) in engineering. (d) All Correct (e)
181. The caretaker (a) is responsible (b) for the maintainance (c) of the school buildings. (d) All Correct (e)
182. The more scarce (a) any collectable (b) item is, the higher (c) the price (d) tends to be. All Correct (e)
183. In times of crisis, (a) / the Bhagavad Gita gives light (b) / and guide to the mind tortured by doubt (c) / and torn by conflict of duties. (d) No error (e)
184. It was not easy for late Raja Ram Mohan Roy (a) / to root out the custom of sati (b) / because a majority of (c) / the educated class does not support him. (d) No error (e)
185. Deplete of the Ozone layer (a) / and the greenhouse effect (b) / are two long-term effects (c) / of air polluttion. (d) No error (e)
186. Most of the people which (a) / have been victims (b) / of extreme violence (c) / are too frightened to report it to the police. (d) No error (e)
187. The doctor helps (a) / to reducing human suffering (b) / by curing diseases (c) / and improving health. (d) No error (e)
188. His derogatory (a) / remark humiliated (b) / me, but I kept my cool (c) / and didn't allow my work to be affected (d) / by it. All Correct (e).
189. The suspected (a) / criminals (b) / who were accused (c) / of snatching ladies necklesses (d) / were finally booked. All Correct (e).
190. The objective (a) / of the programme (b) / is to entertain (c) / the spectators (d) /. All Correct (e).
191. Enforcement of laws and clean and efficiency (a) / administration are fundamental (b) / functions of the government machinery (c) / known as bureaucracy (d) /. All Correct (e).
192. The quantification (a) / of intellectual property is more complicating (b) / than most pricing because today it is relatively (c) / inexpensive (d) / to make copies of most intellectual property. No error (e)
193. Engines used (a) in space shuttles are much larger (b) and more strong (c) than the ones used (d) in jet planes. No error (e).

EXERCISE 2

Phrase Replacement

Directions : Which of the phrases (a), (b), (c) and (d) given below each sentence should replace the phrase printed in bold in the sentence to make it grammatically correct? If the sentence is correct as it is given and no correction is required, mark (e) as the answer.

- After keeping a ten-year-old in detention for around six days, the police **finally registered** a case of fraud against the child and sent him to jail.
 - has finally register
 - final registered
 - is finally registration
 - is final registering
 - No correction required
- Whichever reasons**, there is no denying the changing attitudes to traditions as well as livelihoods, and by implication to the environment as well.
 - Whichever the reasoning
 - Whichever reasoned
 - Whatever reasoning
 - Whatever the reasons
 - No correction required

3. Visiting the village is **like be transported** into some other century.
 (a) alike to transport
 (b) like being transported
 (c) likely to be transporting
 (d) likes transport
 (e) No correction required
4. Environmentalists **has pay little heed** to the 'softer' aspects of the movement, of which the need to change our culture is one of the most important.
 (a) is paying little heed (b) are paying little heeding
 (c) has paid little heeds (d) have paid little heed
 (e) No correction required
5. Even in a changing world, we **cannot wishes away** the Indian nation and replace it with a world government overnight.
 (a) Cannot wish away (b) Can never wishing out
 (c) Cannot wish out (d) Never wishes out
 (e) No correction required
6. Trisha could not solve the problem at all and was at **her wit's ending**.
 (a) her wit's end (b) the wit ends
 (c) her witty end (d) the wit end
 (e) No correction required
7. It's a small theatre and the seats are uncomfortable, but the **saving grace** is that the air conditioning is good.
 (a) grace to save (b) gracing save
 (c) saver grace (d) save to grace
 (e) No correction required
8. Tarun had to prepare the document for his meeting urgently but he was **hardly pressed for time**.
 (a) hard pressed for timely
 (b) hard pressed for time
 (c) hardly press to time
 (d) hard pressing to timely
 (e) No correction required
9. Suraj **lied from his teeth** to get out of the tense situation with his boss.
 (a) lies for his teeth (b) lie to his teeth
 (c) lied through his teeth (d) lied from his tooth
 (e) No correction required
10. Satish lay in bed **wide awaken** as he was worried about his exams starting the next day.
 (a) widen awakening (b) widely awake
 (c) wide and awake (d) wide awake
 (e) No correction required
11. **So successful her business to be**, that Marie was able to retire at the age of 50.
 (a) So successful her business was
 (b) So successful being her business
 (c) Her business was so successful
 (d) So was her successful business
 (e) No correction required
12. The ship was **in mercy of** the waves.
 (a) to be in mercy of
 (b) at the mercy of
 (c) having mercy on
 (d) merciful to
 (e) No correction required
13. **He not to have** resigned, we would have been forced to dismiss him.
 (a) Had he not (b) Had not he
 (c) He had not (d) He not had
 (e) No correction required
14. A wealthy coin collector was eager to pay the huge sum for the coin because it was **one kind**.
 (a) of one kinds (b) one of kinds
 (c) one of a kind (d) one of those kinds
 (e) No correction required
15. The thief carried the knife carefully **to not** cut himself.
 (a) so as not to (b) so not to
 (c) not to (d) not in order to
 (e) No correction required
16. It was my business to cross the bridge to explore the bridgehead and to find out **the extent to which** the enemy had advanced.
 (a) how much (b) the extent where
 (c) the point where (d) limit at which
 (e) No improvement
17. The world is becoming increasingly polarised **between the rich** and the poor.
 (a) among rich (b) around the rich
 (c) in between the rich (d) amid rich persons
 (e) No improvement
18. **I laid all the facts before him** so that he could make his own Judgement.
 (a) laid all the facts in front of him
 (b) lay all the facts before him
 (c) lay all the facts in front of him
 (d) did I lay all the facts before his
 (e) No improvement
19. If only she had told me about her problem **I would have helped her**.
 (a) would help (b) could help
 (c) had helped (d) would not help
 (e) No improvement
20. Apollo was worshipped as long as the Roman Empire **continued**.
 (a) was continued (b) ruled
 (c) lasted (d) did not exists
 (e) No improvement
21. He does not smoke, **nor he drinks**.
 (a) nor he does drink (b) neither he does drink
 (c) nor does he drink (d) but drinks
 (e) No improvement

22. The patient **could have been saved** if he had been taken to the hospital in time.
 (a) could be saved (b) could save
 (c) had been saved (d) can saved
 (e) No improvement
23. I must speak to the landlord about the people above. They make **much noise**.
 (a) much of noise (b) very much noise
 (c) too much noise (d) so much noise
 (e) No improvement
24. When the bomb went off, it broke **all of our windows**.
 (a) all our windows (b) all windows of us
 (c) our all windows (d) all the window
 (e) No improvement
25. Knowing very little English, **it was difficult to converse** with the foreigner.
 (a) i found it difficult to converse
 (b) to converse was difficult
 (c) conversing was difficult
 (d) it was not easy to conversed
 (e) No improvement
26. He is quite well now, **except a slight cold**.
 (a) except with a slight cold
 (b) excepting a slight cold
 (c) except for a slight cold
 (d) except cold slightly
 (e) No improvement
27. The father together with his sons and daughters **have gone** to see a film.
 (a) are gone (b) has gone
 (c) is gone (d) is going
 (e) No improvement
28. The stranger asked the little girl **what is her name**.
 (a) what her name is
 (b) what her name was
 (c) what was her name
 (d) her name is what
 (e) No improvement
29. The family has changed houses twice **during the last** six months.
 (a) since the past (b) after the past
 (c) since the last (d) after the last
 (e) No improvement
30. The plants are dying **for the lack of water**.
 (a) of the lack of water
 (b) for lack of water
 (c) out of lack of water
 (d) due to water
 (e) No improvement
31. The honourable court **had taken a leniency view** because the accused had no previous criminal record.
 (a) had viewed leniency
 (b) had taken a leniency viewing
 (c) had taken a lenient view
 (d) took a lenient view
 (e) No correction required
32. Maintaining global peace is our **self-made commitment** to the world.
 (a) self-making commitment
 (b) self-made committee
 (c) made of self-commitment
 (d) self-commitment made
 (e) No correction required
33. The dinner party hosted by the President at the club was shifted to **an undisclosed location**.
 (a) a locality undisclosed
 (b) a undisclosed location
 (c) an undisclosed location
 (d) location undisclosedly
 (e) No correction required
34. The government should launch such projects which **should reversible** the destructive cycle of flood and drought.
 (a) should have reversible
 (b) should be reverse
 (c) should have been reverse
 (d) should reverse
 (e) No correction required
35. A committee comprising eminent experts from various fields **were setting up**.
 (a) was set up (b) were being set up
 (c) was setting up (d) was being set up
 (e) No correction required
36. Our foreign exchange reserves **have been increased substantial**.
 (a) have been increased substantially
 (b) have increased substantially
 (c) have substantially increasing
 (d) had increased substantially
 (e) No correction required
37. The key to a **competitive economy** is its investment regime.
 (a) competition economy is
 (b) competing economist lays
 (c) economy competition was
 (d) competitive economy lies in
 (e) No correction required
38. Driving a car in jammed traffic **require extraordinary patience** – especially when other drivers are not disciplined.
 (a) required extraordinary patient
 (b) requires extraordinary patience
 (c) requiring extraordinary patience
 (d) None of these
 (e) No correction required
39. Chinese army possesses highly sophisticated simulators on **which their soldiers are training**.
 (a) which their soldiers training on
 (b) on which their soldiers have trains
 (c) which their soldiers do train
 (d) None of these
 (e) No correction required

40. Every novel activity **will be likely to face** resistance from vested interests.
(a) is likely to face (b) will be likely facing
(c) would be like facing (d) would like to face
(e) No correction required
41. We observed that traders were not primarily **dedicated with art of selling**.
(a) dedicated to the art of
(b) dedicated by the art of
(c) dedicated in the art by
(d) dedicated for selling art
(e) No correction required
42. **It is become equally clear** that campaign against smoking will have little success until people realize its importance.
(a) has become equal and clear
(b) has become equally clear
(c) has become clearly equal
(d) becomes equal clearly
(e) No correction required
43. Once the event is over, many people **claimed credit for success** but disown the responsibility for failure.
(a) claim credit of success
(b) claim credit for success
(c) claiming credit for success
(d) claims for credit of success
(e) No correction required
44. People **should be have their own** mechanism to guard against the activities of unscrupulous elements.
(a) shall be have their own
(b) should be having its own
(c) should have owning its
(d) should have their own
(e) No correction required
45. The **real wonder is that** the artisans while constructing the Ajanta Caves possessed only the simplest hand tools.
(a) really wonder is that (b) really wonderful is that
(c) real wonderful is that (d) wonder really is that
(e) No correction required
46. In any serious investigation, all points of suspicions **should check properly**.
(a) must check properly
(b) should be checked properly
(c) should properly check
(d) must properly check
(e) No correction required
47. The circumstances in which **succumbed below pressure**, are not known.
(a) succumbed below force
(b) was succumbed below pressure
(c) was succumbing below force
(d) succumbed to pressure
(e) No correction required
48. All human beings **are vulnerable to** greed and temptations.
(a) are vulnerable for (b) have vulnerability of
(c) were vulnerable at (d) have been vulnerable with
(e) No correction required
49. **How did the burglar got** into the bank is a mystery.
(a) How did the burglar get
(b) What did the burglar get
(c) How the burglar got
(d) Why did the burglar get
(e) No correction required
50. What most of the people think right cannot be **said to be necessary and** right?
(a) said to be necessarily
(b) said to be necessarily and
(c) necessarily said to be
(d) said necessary and to be
(e) No correction required
51. **Expect for you and I, everyone brought** a present to the party.
(a) With the exception of you and I, everyone brought
(b) Except for you and I, everyone had brought
(c) Except for you and me, everyone brought
(d) Except for you and me, everyone had brought
(e) None of these
52. **Although I calculate that he will be here** any minute, I cannot wait much longer for him.
(a) Although I reckon that he will be here
(b) Although I think that he will be here
(c) Because I am confident that he will be here
(d) Because I calculate that he will be here
(e) None of these
53. **We want the teacher to be him** who has the best rapport with the students.
(a) We want the teacher to be he
(b) We want him to be the teacher
(c) We desire the teacher to be him
(d) We anticipate the teacher to be him
(e) None of these
54. Today this is a totally different world **than we have seen** in the last decade.
(a) than what we seen (b) then we have seen
(c) from what we seen (d) from what we have seen
(e) None of these
55. Although he was the most friendly of all present and **different from the others, he hadn't hardly any friends except me**.
(a) different from the others, he hardly had any friends except I
(b) different than the others, he hardly had any friends except me
(c) different than the others, he hardly had any friends except I
(d) different from the others, he hardly had any friends except me
(e) None of these

56. **Since we are living** in Bombay for five years, we are reluctant to move to another city.
- (a) Being that we living
(b) Since we were living
(c) Since we have been living
(d) Being that we have been living
(e) None of these
57. **As a child, my parents took me to Jammu to visit my grandmother.**
- (a) When I was a child, my parents took me to Jammu to visit my grandmother
(b) My parents took me, as a child, to Jammu to visit my grandmother
(c) My parents took me to Jammu to visit my grandmother as a child.
(d) A child, my parents took me to Jammu to visit my grandmother
(e) None of these
58. Anyone interested in the use of computer can learn much **if you have access to** a state-of-the-art microcomputer.
- (a) if he has access to (b) if access is available to
(c) by access to (d) from access to
(e) None of these
59. **Start the motor, and then you should remove the blocks.**
- (a) Start the motor, then removing the blocks
(b) Starting the motor, the blocks should then be removed
(c) Start the motor and then remove the blocks
(d) Starting the motor remove the blocks
(e) None of these
60. The Vice President of the local bank spoke **for a half an hour and told his colleague that he, his colleague, must consider finding a new job**, or accept a reduction in salary.
- (a) for a half hour and told his colleague that he must consider to find a new job
(b) for half an hour and told his colleague that the colleague must get employed by a new bank
(c) for half an hour and told his colleague to consider finding, a new job
(d) no change (e) None of these
61. The higher you climb a Himalayan peak **more cold** you feel.
- (a) the colder (b) the most cold
(c) colder than (d) has enough cold
(e) None of these
62. She wished that her career could be **as glamorous as the other women** but not willing to work as they had.
- (a) as glamorous as the other women's
(b) more glamorous than the career of the other women
(c) glamorous
(d) glamorous like other women
(e) None of these
63. Although he is **liable to** make political enemies with the decision, the Finance Minister will propose severe tax cuts that may both stimulate business and reduce the availability of loans.
- (a) liable from (b) able to
(c) of a mind to (d) liable at
(e) None of these
64. No matter what experience you have had with forest fires, **if you would have witnessed** the fire roaring down through the canyon, you would have been terrified.
- (a) if you witnessed
(b) if you had witnessed
(c) if you could witness
(d) if you will have witnessed
(e) None of these
65. Eaten in Portugal only, the **Indians viewed the potato with suspicion for they** assumed it had poisonous properties since only the white skinned people consumed it.
- (a) Indians viewed the potato with suspicion for they
(b) Indians were suspicious of the potato and they
(c) potato was viewed with suspicion by Indians who
(d) potato was suspicious to Indians, and it was
(e) None of these

EXERCISE 3

Fill in the Blanks

Directions: Each question below has one or two blanks, each blank indicating that something has been omitted. Choose the set of words for each blank which best fits the meaning of the sentence as a whole.

1. We can feel morally when someone insults us – as long as we do not upon those feelings by burning down houses.
- (a) challenged, stand (b) outraged, act
(c) bound, build (d) obliged, think
(e) violated, harp
2. Human beings are biological, they need to be grounded in time and place or else they come
- (a) things, forward (b) souls, back
(c) organisms, unhinged (d) features, undone
(e) creatures, again
3. their golden years of love and togetherness, the couple all their guests at their fiftieth wedding anniversary.
- (a) Celebrating, welcomed
(b) Remembering, asked
(c) Rejoicing, promised
(d) Commemorating, brought
(e) Observing, greeted

4. Since it does not have the to do anything beyond sending out notices, the corporation has now decided to take steps to attach movable properties such as cars so that people take the notices more
- (a) authority, appropriately
(b) influence, justly
(c) guts, sincerely
(d) pressure, gravely
(e) power, seriously
5. A new law has been passed stating that no actor would be allowed to shoot beyond twelve hours in a day and those who this norm would henceforth be for it.
- (a) followed, punished
(b) accompanied, reprimanded
(c) flouted - penalized
(d) defied, applauded
(e) obeyed, disciplined
6. Sunil was asleep and could not be easily awakened.
- (a) high (b) fast
(c) severe (d) total
(e) has
7. The vehicle did not come to a sudden halt since he braked
- (a) immediately (b) silently
(c) gently (d) completely
(e) detected
8. I saw him going escorted two policemen.
- (a) with (b) against
(c) by (d) on
(e) for
9. Madhav is a sick man and has to be taken to the doctor
- (a) usually (b) timely
(c) seldom (d) frequently
(e) avoided
10. The child was left in the servants
- (a) care (b) duty
(c) work (d) help
(e) innocence
11. Sunita had been out of the hospital she slipped and fractured her arm.
- (a) hardly, when (b) just, as
(c) well, and (d) then, when
(e) also, as
12. During the strike, all work at the factory came to a
- (a) stoppage (b) close
(c) decline (d) end
(e) halt
13. A parable is a story with a moral, the story being of the underlying moral.
- (a) familiar (b) identical
(c) irrelevant (d) illustrative
(e) summary
14. Jason promised to an attempt to get better grades this year.
- (a) give (b) make
(c) take (d) keep
(e) have
15. The teacher read the children the story of the 'Titanic'.
- (a) also (b) to
(c) again (d) well
(e) by
16. I was annoyed John for arriving late.
- (a) on (b) about
(c) by (d) for
(e) with
17. We are the possibility of buying our own house.
- (a) judging (b) initiating
(c) threatening (d) applying
(e) considering
18. The student did not pay to the instructions that were given to her in class.
- (a) ear (b) awareness
(c) notice (d) attention
(e) closure
19. The young boy was unhurt for a minor injury to his knee.
- (a) less (b) except
(c) also (d) just
(e) while
20. There is chance of seeing her again she leaves.
- (a) perhaps, when (b) also, as
(c) little, before (d) full, therefore
(e) more, after
21. When I was training for the marathon, I run over 100 kilometres a week.
- (a) have to (b) would
(c) will (d) destined
(e) used to
22. My colleague is one of the kindest people
- (a) that I knows (b) I know
(c) who I know (d) which I know
(e) I had known
23. The lawyer's led to the resolution of the problem.
- (a) behaviour (b) fees
(c) advice (d) impact
(e) approval
24. The government claims that in the telecommunications industry will mean lower prices for customers.
- (a) budget (b) finance
(c) instalments (d) decrease
(e) competition
25. Sarah was walking along the street she tripped over.
- (a) when (b) as
(c) while (d) then
(e) however
26. It is foolish to vent your spleen on a/an object. Still, you make enemies that way.
- (a) immobile-bitter (b) interesting-curious
(c) humane-more (d) inanimate-fewer
(e) None of these

27. Compromise is to passionate natures because it seems to surrender, and to intellectual natures it seems a
- (a) unsuited-submission
(b) odious-confusion
(c) intimidations-dichotomy
(d) inherent-fabrication
(e) None of these
28. The village headman was unlettered, but he was no fool, he could see through the of the businessman's proposition and promptly him down.
- (a) deception - forced (b) naivete - turned
(c) potential- forced (d) sophistry - turned
(e) None of these
29. The newly-opened restaurant at the District Centre to the tastes of people from all walks of life and one is likely to find an group there.
- (a) appeals - archetypal (b) panders - connoisseur
(c) caters - eclectic (d) inhibits - diverse
(e) None of these
30. We must try to understand his momentary for he has more strain and anxiety than any among us.
- (a) vision - forgotten (b) aberration - undergone
(c) outcry - described (d) senility-understood
(e) None of these
31. Learning is more efficient when it is It is less efficient when it is
- (a) fast - slow (b) fun - drudgery
(c) fapid - turtle-slow (d) tedious - like a joy ride
(e) None of these
32. Physicians may soon have to help paralysed people move their limbs bypassing the nerves that once controlled their muscles.
- (a) instruments - detrimental
(b) ways - damaged
(c) reason - involuntary
(d) impediments - complex
(e) None of these
33. The Internet is a medium where the users have nearly choices and constraints about where to go and what to do.
- (a) unbalanced - nonexistent
(b) embarrassing - no
(c) unlimited - minimal
(d) choking - shocking
(e) None of these
34. Education is central because electronic networks and software-driven technologies are beginning to the economic barriers between the nations.
- (a) break down (b) break
(c) crumble (d) dismantle
(e) None of these
35. The present Constitution will see amendments but its basic structure will survive.
- (a) much more (b) too many more
(c) quite a few more (d) many more
(e) None of these
36. The successfully repelled every on the city.
- (a) defenders- comment (b) citizens- onslaught
(c) thieves- robbery (d) judge- criticism
(e) None of these
37. He was very clever, but he performed excellently.
- (a) certainly- obviously (b) never- also
(c) not- always (d) rarely- seldom
(e) None of these
38. A analysis of these substances will show that they differ
- (a) random- minutely (b) detailed- essentially
(c) careful- completely (d) final- Structurally
(e) None of these
39. When the polished the stones, they gleamed with a breath-taking brilliance.
- (a) graphologist (b) cosmetologist
(c) lapidary (d) beagle
(e) None of these
40. As head of the organisation, he attended social functions and civil meetings, but had no in the formulation of company policy.
- (a) hypothetical-vote (b) titular-voice
(c) nominal-competition (d) former-pride
(e) None of these
41. The perpetual spinning of particles is much like that of a top, with one significant difference, unlike the top, the particles have no need to be wound up, for is one of their properties.
- (a) revolution- radical (b) rotation- intrinsic
(c) motion- intangible (d) acceleration- hypothetical
(e) None of these
42. The terrorist was finally by the police.
- (a) famous-apprehended (b) notorious-nabbed
(c) crafty-admonished (d) renowned, caught
(e) None of these
43. If I were you, I be careful with my words.
- (a) will (b) would
(c) shall (d) should
(e) None of these
44. Of the two assistants we employed last month, I find Raman hard working.
- (a) most (b) more
(c) least (d) only
(e) None of these
45. She is so fastidious that of the three houses was liked by her.
- (a) neither (b) either
(c) none (d) no one
(e) None of these
46. a very long time this city has been prosperous.
- (a) Since (b) For
(c) From (d) Till
(e) None of these
47. The mother of the dead child was overwhelmed grief.
- (a) by (b) with
(c) from (d) for
(e) None of these

ANSWER KEY (Exercise - 1)

1	(b)	21	(b)	41	(c)	61	(b)	81	(c)	101	(a)	121	(d)	141	(a)	161	(b)	181	(d)
2	(c)	22	(c)	42	(d)	62	(d)	82	(b)	102	(a)	122	(c)	142	(c)	162	(e)	182	(b)
3	(d)	23	(a)	43	(c)	63	(b)	83	(b)	103	(b)	123	(c)	143	(d)	163	(b)	183	(c)
4	(a)	24	(c)	44	(c)	64	(d)	84	(b)	104	(d)	124	(c)	144	(b)	164	(a)	184	(d)
5	(a)	25	(d)	45	(c)	65	(a)	85	(b)	105	(b)	125	(b)	145	(c)	165	(d)	185	(a)
6	(a)	26	(d)	46	(b)	66	(c)	86	(c)	106	(b)	126	(c)	146	(a)	166	(d)	186	(a)
7	(d)	27	(a)	47	(b)	67	(b)	87	(a)	107	(c)	127	(c)	147	(c)	167	(c)	187	(b)
8	(c)	28	(b)	48	(a)	68	(a)	88	(b)	108	(c)	128	(e)	148	(d)	168	(d)	188	(d)
9	(d)	29	(c)	49	(a)	69	(b)	89	(c)	109	(c)	129	(a)	149	(b)	169	(d)	189	(d)
10	(c)	30	(a)	50	(a)	70	(b)	90	(a)	110	(d)	130	(e)	150	(d)	170	(a)	190	(e)
11	(c)	31	(b)	51	(d)	71	(a)	91	(a)	111	(a)	131	(b)	151	(e)	171	(a)	191	(a)
12	(c)	32	(a)	52	(b)	72	(a)	92	(c)	112	(b)	132	(c)	152	(d)	172	(c)	192	(b)
13	(e)	33	(b)	53	(d)	73	(b)	93	(a)	113	(b)	133	(c)	153	(d)	173	(b)	193	(c)
14	(b)	34	(d)	54	(b)	74	(b)	94	(c)	114	(c)	134	(d)	154	(d)	174	(a)		
15	(c)	35	(b)	55	(d)	75	(b)	95	(c)	115	(a)	135	(c)	155	(a)	175	(b)		
16	(b)	36	(a)	56	(b)	76	(b)	96	(c)	116	(c)	136	(d)	156	(c)	176	(c)		
17	(b)	37	(c)	57	(a)	77	(a)	97	(c)	117	(a)	137	(c)	157	(b)	177	(c)		
18	(a)	38	(b)	58	(b)	78	(c)	98	(b)	118	(a)	138	(b)	158	(d)	178	(b)		
19	(c)	39	(c)	59	(b)	79	(a)	99	(a)	119	(b)	139	(a)	159	(c)	179	(b)		
20	(c)	40	(e)	60	(b)	80	(a)	100	(c)	120	(d)	140	(b)	160	(b)	180	(b)		

ANSWERS & EXPLANATIONS

EXERCISE - 1

1. (b) how she could
2. (c) preferable to
3. (d) for the last 12 years
4. (a) We now look forward to
5. (a) We have been playing
6. (a) In spite of him
7. (d) and personal attention to each child
8. (c) cleared of clouds
9. (d) the importance of your work
10. (c) but also
11. (c) suffer from shortage to experience something very unpleasant or painful examples. These metropolitan cities continue to suffer from serious pollution. The new project is suffering from short of funds and likely to be wound up.
12. (c) were overlooked by
13. (e) No error
14. (b) There is a comparison being made, so comparative degree 'higher' has been used. Therefore instead of 'much' the comparative degree 'more' would be correct.
15. (c) not to
16. (b) first interview he dressed himself
17. (b) the government have come
18. (a) I was about to
19. (c) his office received an important letter
20. (c) informing
21. (b) that he would explain it
22. (c) When he was told
23. (a) One of the objectives
24. (c) Sung, everyone was
25. (d) though college is only a few yard away from his house.
26. (d) the chairman over his statement
27. (a) We were shocked
28. (b) trying their best
29. (c) decided not to
30. (a) The customer had scarcely
31. (b) suited him and therefore
32. (a) Since I had gone
33. (b) will you think
34. (d) for two years
35. (b) the country
36. (a) Manohar has opened not only
37. (c) as one of the most important speeches
38. (b) have been able to plan
39. (c) when I met
40. (e) No answer description available for this question. Let us discuss.
41. (e) no error
42. (d) as he had to go out to work

43. (c) they look after their
44. (c) it was in full steam/full steaming
45. (c) than some participants started
46. (b) to the wall below his window
47. (b) that Mihir had expected
48. (a) I have been trying to finish
49. (a) If you had
50. (a) The five-member committee was
51. (d) way of thinking
52. (b) he keeps telling
53. (d) activities performed by the company
54. (b) for additional wages was
55. (d) maintained it properly
56. (b) raining badly I
57. (a) Rosy herself washes
58. (b) he preferred a white shirt
59. (b) you undertake
60. (b) Sympathise with the poor
61. (b) In the sentence 'The majority of the computer professionals is taken as plural, so the verb 'recommend' instead of 'recommends' should agree.
62. (d) Mahesh
63. (b) into the incident
64. (d) and a flexible way of thinking
65. (a) 'They had been'
66. (c) towards the end
67. (b) to defend the hard-won
68. (a) If a man diligently seeks to come into contact
69. (b) remind me
70. (b) we witnessed a collision
71. (a) He couldn't help but
72. (a) The brand proposition now therefore is
73. (b) in a bad mood
74. (b) he has not so far sent
75. (b) that the dispute on this issue is between my brother and me
76. (b) what I want is
77. (a) While he was walking slowly in the park
78. (c) to butter
79. (a) At the present juncture
80. (a) Troy was taken by the Greeks
81. (c) and to remember for a longer period of time
82. (b) more than one and a half hour
83. (b) but his mother
84. (b) going to Agra
85. (b) he would rather fail than copy
86. (c) won't you?
87. (a) Both of you
88. (b) than we took a hasty breakfast
89. (c) without anyone being able to control it
90. (a) When he was asked what was wrong with him.
91. (a) Remember that you are a part of
92. (c) with a scheme that was potentially harmful to animal welfare.
93. (a) with a little patience
94. (c) 'did one' or 'did any'
95. (c) as in a small one
96. (c) 'wherever they may lead'
97. (c) that can penetrate the biological tissue
98. (b) why I called
99. (a) The person who was
100. (c) hasn't she?
101. (a) He did not give them any money
102. (a) My wife got
103. (b) wants to visit
104. (d) No error
105. (b) 'a little tea' or 'some tea'
106. (b) we entered the room
107. (c) we had been looking for a suitable alliance for three years.
108. (c) If I do not economise
109. (c) his dreams now is about visiting the moon
110. (d) No answer description available for this question. Let us discuss.
111. (a) She walked into
112. (b) It should be 'have changed', the noun is plural (ways), has is used for singular nouns.
113. (b) because they persisted in suggesting
114. (c) to pass time thus
115. (a) 'Gopal and I'
116. (c) India is learning how to negotiate
117. (a) the graceful folk dance had been performed.
118. (a) the actor who was
119. (b) who till now paid property tax
120. (d) forced to shoot for late hours because actors come very late.
121. (d) helping in preventing damage to the grey matter.
123. (c) who was planning to strike at
125. (b) years of research in the chemistry and biochemistry lab
126. (c) you can
127. (c) cannot
129. (a) He told me
131. (b) a purposeful
132. (c) intelligence and firm
137. (c) the necessity of pursuing peace
138. (c) visited an orphanage
140. (b) Swine flu, preventive measures had been put in place
141. (a) The administration has concluded
142. (c) neither the centre nor the state initiated steps
143. (d) but a lot more remains to be understood
144. (b) to explore pros and cons of
146. (a) Jason sold his house
147. (c) nothing much better
148. (d) owing to heavy floods
166. (d) The noun is ladies, so the pronoun used for them cannot be 'it' (which is used for things) but 'their'.
173. (b) Since it is a city-Bangalore- 'where' must be used instead of 'which' because the referent is a place and not a thing.
174. (a) Neither Alice nor mery remembers

- 180. (b) is now compulsory
- 181. (d) of the school building
- 187. (b) in reducing human suffering
- 188. (d) and didn't allow my work to affect
- 189. (d) The necklesses be replaced by 'necklaces'
- 190. (e) All correct
- 191. (a) replace 'efficiency' with 'efficient'
- 192. (b) It should be "complicated"
- 193. (c) For the verb 'strong' the comparative degree usage is 'stronger' and not more strong.

ANSWER KEY (Exercise - 2)

1	(e)	9	(c)	17	(e)	25	(e)	33	(e)	41	(a)	49	(c)	57	(a)	65	(c)
2	(d)	10	(d)	18	(e)	26	(c)	34	(d)	42	(b)	50	(a)	58	(a)		
3	(b)	11	(c)	19	(e)	27	(b)	35	(a)	43	(b)	51	(c)	59	(c)		
4	(d)	12	(b)	20	(c)	28	(b)	36	(b)	44	(d)	52	(a)	60	(c)		
5	(a)	13	(a)	21	(c)	29	(c)	37	(e)	45	(e)	53	(a)	61	(a)		
6	(a)	14	(c)	22	(e)	30	(b)	38	(b)	46	(b)	54	(d)	62	(a)		
7	(e)	15	(a)	23	(c)	31	(c)	39	(d)	47	(d)	55	(d)	63	(e)		
8	(b)	16	(c)	24	(a)	32	(e)	40	(a)	48	(e)	56	(c)	64	(b)		

EXERCISE-2

- 10. (d) Wide-awake means fully awake
So excited, she was wide-awoke all night
- 16. (c) The correct sentence should read, 'It was my business to cross the bridge to explore the bridge head and to find out the point where the enemy had advanced'. Therefore, (c) is the correct answer, the reason being the enemy had already advanced to that place. Therefore its a particular point or destination; the other two options the extent where and how much means the exact point or location is unknown therefore these options are correct.
- 17. (e) This sentence is grammatically correct. None of the suggested changes will improve it. So, the option (e) is the correct answer.
- 18. (e) This sentence is correct. None of the changes suggested will improve it. So, the option (e) is the correct answer.
- 19. (e) This sentence is grammatically correct. None of the changes suggested will improve it. So, the option (e) is the correct answer.
- 20. (c) The correct sentence should read, 'Apollo was worshipped as long as the Roman empire 'lasted' therefore, option (c) is the correct answer. The reason being Apollo was worshipped till the Roman empire was there: therefore 'lasted' fits in best, the other two options was continued or ruled are incorrect.
- 28. (b) The correct sentence should be :
The stronger asked the little girl what her name was
- 31. (c) 'Leniency' is not the grammatically correct word to be used; the correct word is lenient and the only answer choice which uses this word is option (c).
- 32. (e) The sentence is grammatically correct, so no correction is required.
- 33. (e) The sentence is correct, so no correction is required.
- 34. (d) None of the given answer choices fit in correctly as some of the other grammatical error is present. The correct form of sentence would be "The government should launch such projects which should reverse the destructive cycle of flood and drought !"
- 35. (a) Only the first answer choice fits correctly because the sentence is in the past tense where the action 'that is of setting up the committee' is already over.
- 36. (b) The correct answer choice is (b) because it expresses that the action is complete, i.e. our foreign exchange reserves have increased substantially. The sentence is the form of present perfect tense. The 1st answer choice would have fit in if the action would have begun in past and still continued, i.e. present perfect continuous tense.
- 37. (e) The sentence is grammatically correct and no correction is required .
- 38. (b) Here 'driving a car in jammed traffic' denotes ' driving' as gerund. Example : Swimming is a sport. Riding is pleasanter than walking. So the option (b) requires extraordinary patience' fits in.
- 39. (d) None of the given answer choice fit correctly in the sentence.
- 40. (a) Only the answer choice (a) fits correctly because the sentence is in simple present tense and if 'will be or would be' is used it becomes a sentence which uses future tense.
- 41. (a) The word dedicated cannot be used with 'by' 'in' and 'with'; grammatically it can only be used with word 'to' something.
- 42. (b) The sentence is an illustration of present perfect tense so it should use 'has' in place of 'is' because after reading the sentence it becomes clear as to what will be the consequences of the campaign .
- 43. (b) The second answer choice fits correctly because the 'ed' form of word 'claim' cannot be used.
- 44. (d) None of the given answer choices fit in correctly. The correct grammatical form of sentence will be 'People should have their own mechanism'.

45. (e) The sentence is grammatically correct and no correction is required.
46. (b) should be checked ...
47. (d) 'to' should follow succumb.
48. (e) No correction requires.
49. (c) How the burglar got into ...
50. (a) Said to be necessarily
51. (c) When the word 'except' is used, 'me' is used with it instead of I, so the most appropriate form of this phrase will be except for you and me.
52. (a) 'Calculate' is not an appropriate word for this sentence, calculation is done on the basis of available facts with certain fixed rules, whereas according to the sense of the sentence the person is only making a guess or a supposition, thus reckon is the most appropriate word that can be used to replace calculate.
53. (a) 'him' is not the right usage because it is a possessive pronoun, and in the sentence it is followed by who, which is used to refer. So the pronoun he should be used. He, who has the best rapport with the students.
54. (d) Different is used with 'from' e.g- 'you are different from Ritu'. Than is used for comparisons, e.g., The world is more populated than it was in our time.
55. (d) When we use the word 'hardly', it implies a negative meaning, there is then no need to use not, so the most suitable use is 'he hardly had any friends'.
56. (c) The tense in this sentence should be the present perfect continuous because it refers to an action that started at some time in past and continues till the present time so right use is 'have been living in Mumbai.'
57. (a) As a child, should be followed by a phrase that has 'child' as its subject, i.e., as a child I was taken by my parents to visit Jammu & Kashmir or other ways, we can change the first part of the sentence, the second part describes an action so the first should be an adverb clause. Thus when I was child is the most suitable alternative.
58. (a) 'Anyone' implies a person involved. So a personal pronoun will be needed to give conditions later in the sentence, there must be a 'he' or 'one' in the sentence. The noun cannot be in the second person but has to be in the third person because 'Anyone' refers to an unknown third person.
59. (c) The use of the modal 'should' is unnecessary in this statement. It is a statement giving directions.
60. (c) The part he, his colleague could easily be eliminated and a simpler form of to + verb can be used to make the sentence more appropriate (a) is grammatically incorrect since it has omitted the article 'an' (b) changes the meaning or intent of the underlined phrase. Thus (c) is the most suitable choice.
62. (a) The comparison is between the careers of the two women and not a woman and the career of another women. The subject is absent from the sentence but if you complete the sentence you will find it should be she wished that her career was as glamorous as the other woman's career. In sentences such as these where the noun is hidden, it is helpful to complete the noun to find the correct answer.
63. (e) Liable to means, it is an event that will happen. This is the only phrase which would fit in with the sense of the rest of the sentence. So there will be no change
64. (b) would is a modal and its use here is unnecessary. There is a 'would have' in the second part of the sentence but it should not be repeated in the first one, because the use of 'would have' is done as a possibility of an affect of something done in past. So generally would have will be followed by a past perfect verb.
65. (c) The first part of the sentence is directed at a subject, which is 'eaten in Portugal only', i.e., the potato, therefore the comma should be followed by a phrase with potato as its subject and not Indians. Of (c) & (d), (c) is the right option because 'suspicious to Indian' is not an appropriate usage.

42. (b) **Apprehend** means to arrest, **nabbed** means to catch, admonish is scolding mildly, the second gap could be filled by either option (a), (b) or (d) renowned means popular for some talent or skill, thus, too can be eliminated. The choice is between (a) and (b), notorious means popular for wrong reason and is, therefore, a more appropriate choice than famous.
43. (b) The sentence gives a condition, so the principle clause will use 'would' not 'will'.
44. (b) Since there is a comparison between two, a comparative degree verb must be used.
45. (c) Since the numbers are more than two, neither cannot be used, either is positive so will oppose the meaning of the sentence and 'no one' is used for persons not things.
46. (b) In the perfect continuous tense only 'for' and 'since' are used. 'since' is used to suggest a particular time in past and 'for' is used to suggest a time period, 'a long time' suggest a time period so 'for' will be the answer.
47. (b) 'With' is used with overwhelmed.



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COMPREHENSION TEST

CHAPTER 2

Reading Comprehension

Comprehension is the process of making meaning from a written text. Typically, a candidate might have difficulty understanding due to limited vocabulary and/or a lack of familiarity with the subject matter. Both these constraints may be remedied by reading more widely and making friends with a good dictionary.

How to Improve Reading Comprehension

Reading is all about information. It is not about the number of words you read, but the amount of value you extract from them. The key to improved reading comprehension is not moving your eyes across a page more quickly. It's about creating a mental framework that helps you process words and ideas.

With a bit of practice, anyone can read faster and more productively. The steps outlined below will help you to extract the maximum amount of information in the least amount of time.

Before reading the text, ask yourself what you already know about its topic. Try to recall as much information as you can. Think of related ideas you've learned in the past. Make brief notes about your thoughts or discuss what you remember with others. Reading comprehension requires motivation, mental frameworks for holding ideas, concentration and good study techniques. Here are some suggestions:

Improve Your Reading Comprehension by Researching the Topic

Background information may appear on book covers and inner flaps of book jackets. Many books include an introductory section and a mini-biography about the author. Book publisher's websites may also include background information. Think about the information you read. Ask:

- What kind of text is this?
- What new information did I learn, and what do I expect to learn?
- Is this text informative or entertaining, fact or fiction?
- What interests me about this book?

Develop a broad background

Broaden your background knowledge by reading newspapers, magazines and books. Become interested in world events.

Improve Your Understanding

As you read, what questions come to mind? Read on to find the answers. You can think about the questions and answers or jot them down on paper. Research indicates that writing notes by hand can increase comprehension and recall among students who are not learning disabled in writing. For those who have LDs in writing mechanics, pair the writing with discussion to improve understanding and recall.

Know the structure of paragraphs

Good writers construct paragraphs that have a beginning, middle and end. Often, the first sentence will give an overview that helps provide a framework for adding details. Also, look for transitional words, phrases or paragraphs that change the topic.

Identify the type of reasoning

Does the author use cause and effect reasoning, hypothesis, model building, induction or deduction, systems thinking?

Anticipate and predict

Really smart readers try to anticipate the author and predict future ideas and questions. If you're right, this reinforces your understanding. If you're wrong, you make adjustments quicker.

Look for the method of organization

Is the material organized chronologically, serially, logically, functionally, spatially or hierarchically.

Create motivation and interest

Preview material, ask questions, discuss ideas with classmates. The stronger your interest, the greater your comprehension.

Pay attention to supporting cues

Study pictures, graphs and headings. Read the first and last paragraph in a chapter, or the first sentence in each section.

Highlight, summarize and review

Just reading a book once is not enough. To develop a deeper understanding, you have to highlight, summarize and review important ideas.

Build a good vocabulary

For most educated people, this is a lifetime project. The best way to improve your vocabulary is to use a dictionary regularly. You might carry around a pocket dictionary and use it to look up new words. Or, you can keep a list of words to look up at the end of the day. Concentrate on roots, prefixes and endings.

As you read, make a list of unfamiliar vocabulary words. Look up the meanings of the words in the dictionary, and jot definitions down by hand. Writing definitions by hand will help you remember the definition much more than by typing or by reading alone.

Monitor effectiveness

Good readers monitor their attention, concentration and effectiveness. They quickly recognize if they've missed an idea and backup to reread it.

Test Yourself to Determine How Well You've Learned the material.

After your reading session, quiz yourself on the main points. What was the main idea? Who are the characters in the story? What information did you learn? Jot down your thoughts in your own words to help you remember them and give you deeper insight into the topic. If expressive writing is difficult for you, jot shorter notes and discuss the reading with a friend or parent.

EXERCISE

DIRECTIONS (Qs. 1-8) : Read the following passage carefully and answer the questions given below. Certain words/phrases are printed in bold to help you to locate them while answering some of the questions.

In the second week of August 1998, just a few days after the incidents of bombing the US embassies in Nairobi and Dar-es-Salaam, a high-powered, brain-storming session was held near Washington D.C. to discuss various aspects of terrorism. The meeting was attended by ten of America's leading experts in various fields such as germ and chemical warfare, public health, disease control and also by the doctors and the law-enforcing officers. Being asked to describe the horror of possible bio-attack, one of the experts narrated the following **gloomy** scenario.

A culprit in a crowded business centre or in a busy shopping mall of a town empties a test tube containing some fluid, which in turn creates an unseen cloud of germ of a dreaded disease like anthrax capable of inflicting a horrible death within 5 days on any one who inhales it. At first 500 or so victims feel that they have mild influenza which may recede after a day or two. Then the symptoms return again and their lungs start filling with fluid. They rush to local hospitals for treatment, but the panic-stricken people may find that the medicare services run quickly out of drugs due to excessive demand. But no one would be able to realise that a terrorist attack has occurred. One cannot deny the possibility that the germ involved would be of contagious variety capable of causing an epidemic. The meeting concluded that **such attacks**, apart from causing immediate human tragedy, would have dire long-term effects on the political and social fabric of a country by way of ending people's trust on the competence of the government.

The experts also said that the bombs used in Kenya and Tanzania were of the old-fashion variety and involved quantities of high explosives, but new terrorism will prove to be more deadly and probably more **elusive** than hijacking an aeroplane or a gelignite of previous decades. According to Bruce Hoffman, an American specialist on political violence, old terrorism generally had a specific manifesto - to overthrow a colonial power or the capitalist

system and so on. These terrorists were not shy about planting a bomb or hijacking an aircraft and they set some limit to their brutality. Killing so many innocent people might turn their natural supporters off. Political terrorists want a lot of people watching but not a lot of people dead. "Old terrorism sought to change the world while the new sort is often practised by those who believe that the world has gone beyond redemption", he added.

Hoffman says, "New terrorism has no long-term agenda but is ruthless in its short-term intentions. It is often just a **cacophonous** cry of protest or an outburst of religious **intolerance** or a protest against the West in general and the US in particular. Its **perpetrators** may be religious fanatics or diehard opponent of a government and see no reason to show restraint. They are simply intent on **inflicting** the maximum amount of pain on the victim."

- In the context of the passage, the culprit's act of emptying a test tube containing some fluid can be classified as
 - a terrorist attack
 - an epidemic of a dreaded disease
 - a natural calamity
 - panic created by an imaginary event
 - None of these
- In what way would the new terrorism be different from that of the earlier years ?
 - More dangerous and less baffling
 - More hazardous for victims
 - Less complicated for terrorists
 - A and C only
 - B and C only
 - A and B only
 - All the three
 - None of these
- What was the immediate provocation for the meeting held in August 1998 ?
 - the insistence of America's leading
 - the horrors of possible bio-attacks
 - a culprit's heinous act of spreading germs
 - people's lack of trust in the government
 - None of these

4. What could be the probable consequences of bio-attacks, as mentioned in the passage ?
- A. Several deaths
B. Political turmoil
C. Social unrest
(a) A only (b) B only
(c) C only (d) A and B only
(e) All the three
5. The author's purpose of writing the above passage seems to explain
- (a) the methods of containing terrorism
(b) the socio-political turmoil in African countries
(c) the deadly strategies adopted by modern terrorists
(d) reasons for killing innocent people
(e) the salient features of terrorism of yester years
6. According to the author of the passage, the root cause of terrorism is
- A. religious fanaticism
B. socio-political changes in countries
C. the enormous population growth
(a) A only (b) B only
(c) C only (d) A and B only
(e) All the three
7. The phrase "**such attacks**", as mentioned in the last sentence of the second paragraph, refers to
- (a) the onslaught of an epidemic as a natural calamity
(b) bio-attack on political people in the government
(c) attack aimed at damaging the reputation of the government
(d) bio-attack manoeuvred by unscrupulous elements
(e) None of these
8. The sole objective of the old terrorism, according to Hoffman, was to
- (a) plant bombs to kill innocent people
(b) remove colonial power or capitalist system
(c) make people realise the incompetence of the government
(d) give a setback to socio-political order
(e) None of these

DIRECTIONS (Qs. 9-10) : Choose the word which is most **OPPOSITE** in meaning of the word printed in capital as used in the passage.

9. **gloomy**
- (a) discouraging (b) disgusting
(c) bright (d) tragic
(e) versatile
10. **cacophonous**
- (a) loud (b) melodious
(c) sonorous (d) harsh
(e) distant

DIRECTIONS (Qs. 11-12) : Choose the word which is most nearly **THE SAME** in meaning to the word printed in capital as used in the passage.

11. **perpetrators**
- (a) opponents (b) followers
(c) sympathisers (d) leaders
(e) manoeuvrers
12. **elusive**
- (a) harmful (b) fatal
(c) destructive (d) baffling
(e) obstructing

DIRECTIONS (Qs. 13-20) : Read the following passage carefully and answer the questions given below it. Certain words/phrases are given in **bold** to help you to locate them while answering some of the questions.

In a disarmingly frank talk at the Indian Merchants Chamber in Mumbai, the Japanese Ambassador in India dwelt at length on issues that exercise the minds of Japanese investors when they consider investment proposals in India.

Raising the question "What comparative advantages does India offer as an investment market ?", he said though labour in India is expensive, wage-levels are offset by productivity level to a large extent.

Acknowledging that the vastness of the Indian market is a great **inducement** for investment in manufacturing industry, he wondered if it was **justifiable** to provide that overseas remittance of profit in foreign exchange be fully covered by exchange earnings as had been done. Significantly, on the eve of the Prime Minister's visit to Japan, the government delinked profits repatriation from exports, meeting this demand.

The Ambassador said foreign investors needed to be assured of the continuity and consistency of the liberalisation policy and the fact that new measures had been put into force by means of administrative notifications without amending government laws acted as a damper.

The Ambassador pleaded for speedy formulation of the exit policy and pointed to the highly restrictive control by the government on disinvestment by foreign partner in joint ventures in India.

While it is all too easy to dismiss critical comment on conditions in India **contemptuously**, there can be little doubt that if foreign investment is to be wooed **assiduously**, we will have to meet exacting international standards and cater at least partially to what we may consider the **idiosyncrasies** of our foreign collaborators. The Japanese too have passed through a stage in the fifties when their products were derided as sub-standard and **shoddy**. That they have come out of that ordeal of fire to emerge as an economic superpower speaks a much of their doggedness to pursue goals against all odds acceptable standards.

There is no gainsaying that the past record of Japanese investment is a poor benchmark for future expectations.

13. The author has appreciated the Japanese for their
- (a) quality of products manufactured in the fifties.
(b) passing through an ordeal.
(c) perseverance in raising quality of products.
(d) future expectations.
(e) None of these
14. According to the Japanese Ambassador, which of the following motivates the foreign investors to invest in Indian manufacturing industry? .
- (a) very large scope of Indian market
(b) overseas remittance of profit in foreign exchange
(c) assurance of continuity of the liberalisation policy
(d) high productivity levels
(e) None of these

15. The purpose of the author in writing this passage seems to be to
- discourage foreign investment in India.
 - critically examine Indian investment environment.
 - paint a rosy picture of India's trade and commerce.
 - criticize government's liberalization policy.
 - raise the expectations of foreign investors.
16. According to the Japanese Ambassador, India offers a comparative advantage to foreign investors in terms of
- inexpensive labour
 - abysmally low wage levels
 - higher productivity
 - skilled workforce
 - None of these
17. For seeking more and more foreign investment, the author suggests that we should
- satisfy fully the whims of our foreign collaborators.
 - dismiss all critical comments on Indian conditions.
 - link profit repatriations to exports.
 - raise the quality of product to match international standards.
 - None of these
18. From the passage it can be inferred that the author is
- a political commentator.
 - a secretary of the Japanese Ambassador.
 - a Japanese investor.
 - an Indian investor.
 - None of these
19. The author attributes Japan's emergence as an economic superpower to
- their ability to overcome any ordeal.
 - their tenacity and perseverance despite unfavourable circumstances.
 - their ability to improvise and adapt to globally acceptable quality levels.
- A & B only
 - B & C only
 - A & C only
 - All the three
 - None of these
20. Which of the following statement(s) is/are true about the critical comments on investment conditions in India?
- These comments are difficult to be countered.
 - These comments are received from various international quarters.
 - These comments are based more on biases than on facts.
- Only C
 - Only B
 - Only A
 - A & B only
 - A & C only

DIRECTIONS (Qs. 21-22): Choose the word which is most nearly the SAME in meaning to the word printed in capital as used in the passage.

21. **ASSIDUOUSLY**

- persistently
- hastily
- feebly
- deliberately
- innocently

22. **IDIOSYNCRASIES**

- demands
- needs
- deviations
- ideologies
- identity

DIRECTIONS (Qs. 23-24): Choose the word which is most OPPOSITE in meaning of the word printed in capital as used in the passage.

23. **INDUCEMENT**

- incentive
- motive
- breach
- temptation
- impediment

24. **JUSTIFIABLE**

- unreasonable
- formidable
- irrevocable
- unscrupulous
- inevitable

DIRECTIONS (Qs. 25-28): Read the following passage carefully and answer the questions given below it. Certain words/phrases are printed in bold to help you to locate them while answering some of the questions.

Since July 1991, the government of India has effectively put the liberalisation policy into practice. The drastic steps even include some administrative reforms for **pruning** the government agencies. Last year the Japanese business circles represented by the Ishikawa Mission called attention of their Indian counterparts to what they considered to be the major impediments in India. However, thanks to the almost revolutionary reforms put into effect by the Indian government, those **impediments** either have been removed or now are on their way out. This development gives a new hope for the future of economic co-operation between the two countries. At the same time, it should be borne in mind that there is a **stiff** competition with other countries, notably China and South-East Asian countries, in this regard. The success stories of ASEAN countries welcoming Japanese investments with adequate infrastructure are already known in India but it may be useful if further studies of Japanese joint ventures in ASEAN countries be made by Indian business circles. The coastal areas of China have initiated a very active campaign to welcome foreign economic participation.

Beyond our bilateral relationship, India's more active participation in global economy is needed. India certainly deserves a far bigger share of world trade considering its vast resources. It is strongly hoped that the Indian government's recently initiated effort of enlarging its export market would bear fruit.

India has **steadfastly** maintained its parliamentary democracy since independence. Considering its size, its population and its internal complexity, the overall maintenance of national integrity and political stability under parliamentary democracy is remarkable and admirable indeed. Here lies the base for the status of India in the world. By effectively implementing its economic reform with the support of public opinion, this democratic polity of India has again demonstrated its viability and **resilience**. At the same time, it gives hope and inspiration to the whole world which faces the difficult problem of North-South confirmation.

25. The Ishikawa Mission during its visit to India emphasized on
- future economic co-operation between Japan and India.
 - need for removing policy and/or implementation hurdles.
 - need for a stiff competition.
 - striking down revolutionary reforms.
 - None of these
26. How did the Indian government react to the hurdles in the way of bilateral trade between India and Japan?
- The government, in principle, agreed for removal of these hurdles.
 - Bureaucracy succeeded in maintaining a status quo.
 - Government thought it was against liberalisation policy.
 - The Japanese delegation could not forcefully argue their case.
 - It failed to remove these hurdles.
27. What is the result of Japanese investments in ASEAN nations?
- It could not gather momentum for want of infrastructure.
 - The experiment failed because of stiff competition from other countries.
 - China and South-East Asian countries objected to Japanese investments.
 - The passage does not provide complete information..
 - None of these
28. Which of the following is TRUE about the author's view regarding India's participation in world trade?
- India should actively contribute in a big way as it had tremendous resources.
 - India's sharing in global economy has already been very fast and beyond its resources.
 - India should refrain from making efforts in enlarging its export market.
 - India needs to first strengthen its democracy.
 - None of these
29. It can be inferred from the content of the passage that the author is a/an
- political analyser
 - Japanese bureaucrat
 - economist
 - Japanese politician
 - Indian Prime Minister
30. The author seems to appreciate India's national integrity and political stability particularly in view of which of the following ?
- the size of the country
 - India's population
 - its internal complexity
- None of the three
 - All the three
 - A & B only
 - B & C only
 - A & C only
31. The author feels that India has a better status in the world market because of its
- success in political stability and national integration in democratic set-up.
 - vast population.
 - giant size.
 - effective bilateral relationship with other countries.
 - foreign economic participation.
32. Which of the following statements is TRUE in the context of the passage?
- India's successful experiment of economic reform has become an inspiration to the world.
 - Size, population and internal complexity of our country are the barriers in the way of attaining national integrity and political stability.
 - A few government agencies were not in favour of liberalisation policy at the beginning.
- A only
 - B only
 - C only
 - All the three
 - None of these
- DIRECTIONS (Qs.33-34) : Choose the word which is most nearly the SAME in meaning as the word printed in bold as used in the passage.**
33. **resilience**
- quietening
 - amplifying
 - existence
 - adaptability
 - rejuvenation
34. **pruning**
- activating
 - trimming
 - punishing
 - encouraging
 - empowering
- DIRECTIONS (Qs.35-36) : Choose the word which is most OPPOSITE in meaning of the word printed in bold as used in the passage.**
35. **stiff**
- stubborn
 - indelible
 - tense
 - yielding
 - soapy
36. **impediments**
- exaggeration
 - compendium
 - obstacle
 - aggravation
 - furtherance.
- DIRECTIONS (Qs. 37-44) : Read the following passage carefully and answer the questions given below it. Certain words/phrases are printed in bold to help you to locate them while answering some of the questions.**
- There is no field of human endeavour that has been so misunderstood as health. While health which **connotes** well-being and the absence of illness has a low profile, it is illness representing the failure of health which virtually monopolizes attention because of the fear of pain, disability and death. Even Sushruta has warned that this provides the medical practitioner power over the patient which could be misused.
- Till recently, patients had implicit faith in their physician whom they loved and respected, not only for his knowledge but also in the total belief that practitioners of this noble profession, guided by ethics, always placed the patient's interest above all other considerations. This rich interpersonal relationship between the physician, patient and family has, barring a few exceptions, prevailed till the recent past, for caring was considered as important as curing. Our indigenous systems of medicine like ayurveda and

yoga have been more **concerned** with the promotion of the health of both the body and mind and with maintaining a harmonious relationship not just with fellow-beings but with nature itself, of which man is an integral part. Healthy practices like cleanliness, proper diet, exercise and meditation are part of our culture which sustains people even in the prevailing conditions of poverty in rural India and in the unhygienic urban slums.

These systems consider disease as an **aberration** resulting from disturbance of the equilibrium of health, which must be corrected by gentle restoration of this balance through proper diet, medicines and the establishment of mental peace. They also teach the graceful acceptance of old age with its infirmities resulting from the normal **degenerative** process as well as of death which is **inevitable**.

This is in marked contrast to the western concept of life as a constant struggle against disease, ageing and death which must be fought and conquered with the knowledge and technology **derived** from their science: a science which, with its narrow dissective and quantifying approach, has provided us the understanding of the microbial causes of communicable diseases and provided highly effective technology for their prevention, treatment and control. This can rightly be claimed as the greatest contribution of western medicine and justifiably termed as 'high' technology. And yet the contribution of this science in the field of non-communicable diseases is remarkably poor despite the far greater inputs in research and treatment for the problems of ageing like cancer, heart diseases, paralytic strokes and arthritis which are the major problems of affluent societies today.

37. Which of the following has been described as the most outstanding benefits of modern medicine?
- (a) The real cause and ways of control of communicable diseases
 (b) Evolution of the concept of harmony between man and nature
 (c) Special techniques for fighting ageing
 (a) Only B and C (b) Only A and B
 (c) Only A (d) Only B
 (e) Only C
38. In India traditionally the doctors were being guided mainly by which of the following?
- (a) High technology (b) Good knowledge
 (c) Professional ethics (d) Power over patient
 (e) Western concept of life
39. What caution have proponents of indigenous systems sounded against medical practitioners?
- (a) Their undue concern for the health of the person.
 (b) Their emphasis on research on non-communicable diseases.
 (c) Their emphasis on curing illness rather than preventive health measures.
 (d) Their emphasis on restoring health for affluent members of the society.
 (e) None of these
40. Why has the field of health not been understood properly?
- (a) Difficulty in understanding distinction between health and illness.

- (b) Confusion between views of indigenous and western system.
 (c) Highly advanced technology being used by the professionals.
 (d) Not given in the passage.
 (e) None of these

41. Why, according to the author, have people in India survived in spite of poverty?
- (a) Their natural resistance to communicable diseases is very high.
 (b) They have easy access to western technology.
 (c) Their will to conquer diseases
 (d) Their harmonious relationship with the physician
 (e) None of these
42. Which of the following pairs are mentioned as 'contrast' in the passage?
- (a) Western concept of life and science.
 (b) Technology and science.
 (c) Western physician and western-educated Indian physician.
 (d) Indian and western concepts of life.
 (e) Knowledge and technology.
43. Why does the author describe the contributions of science as remarkably poor?
- (a) It concentrates more on health than on illness.
 (b) It suggests remedies for the poor people.
 (c) It demands more inputs in terms of research and technology.
 (d) The cost of treatment is low.
 (e) None of these
44. The author seems to suggest that
- (a) we should give importance to improving the health rather than curing of illness.
 (b) we should move towards becoming an affluent society.
 (c) ayurveda is superior to yoga.
 (d) good interpersonal relationship between the doctor and the patient is necessary but not sufficient.
 (e) ayurvedic medicines can be improved by following western approaches and methods of sciences.

DIRECTIONS (Qs. 45-46) : Choose the word which is most OPPOSITE in meaning of the word printed in bold as used in the passage.

45. **Inevitable**
- (a) Undesirable (b) Unsuitable
 (c) Detestable (d) Avoidable
 (e) Available
46. **Degenerative**
- (a) Recuperative (b) Revolving
 (c) Productive (d) Innovative
 (e) Integrative

DIRECTIONS (Qs. 47-48) : Choose the word which is most nearly the SAME in meaning as the word printed in bold as used in the passage.

47. **Connotes**

- (a) Helps (b) Cures
(c) Follows (d) Confirms
(e) Implies

48. **Aberration**

- (a) Observation (b) Alternative
(c) Deviation (d) Outcome (e) Stimulate

DIRECTIONS (Qs. 49-56) : Read the following passage and answer the questions given below it. Certain words/phrases are given in bold to bold you to locate them while answering some of the questions.

We have inherited the tradition of secrecy about the budget from Britain where also the system has been strongly attacked by eminent economists and political scientists including Peter Jay. Sir Richard Clarke, who was the originating genius of nearly every **important** development in the British budgeting techniques during the last two decades, has spoken out about the abuse of budget secrecy: "The problems of long-term tax policy should surely be debated openly with the facts on the table. In my opinion, all governments should have just the same **duty** to publish their expenditure policy. Indeed, this obligation to publish taxation policy is really essential for the control of public expenditure in order to get realistic taxation implications." Realising that democracy **flourishes** best on the principles of open government, more and more democracies are having an open public debate on budget proposals before introducing the appropriate Bill in the legislature. In the United States the budget is conveyed in a message by the President to the Congress, which comes well in advance of the date when the Bill is introduced in the Congress. In Finland the Parliament and the people are already discussing in June the tentative budget proposals which are to be introduced in the Finnish Parliament in September. Every budget contains a cartload of figures in black and white - but the dark figures represent the **myriad** lights and shades of India's life, the contrasting tones of poverty and wealth, and of bread so dear and flesh and blood so cheap, the deep tints of adventure and enterprise and man's ageless struggle for a brighter morning. The Union budget should not be an annual **scourge** but a part of presentation of annual accounts of a partnership between the Government and the people. That partnership would work much better when the nonsensical secrecy is replaced by openness and public consultations, resulting in fair laws and the people's acceptance of their moral duty to pay.

49. How do the British economists and political scientists react to budget secrecy? They are
- (a) in favour of having a mix of secrecy and openness.
(b) indifferent to the budgeting techniques and taxation policies.
(c) very critical about maintenance of budget secrecy.
(d) advocates of not disclosing in advance the budget contents.
(e) None of these
50. The author thinks that openness in budget is essential as it leads to

- (a) prevention of tax implications
(b) people's reluctance to accept their moral duties
(c) exaggerated revelation of the strengths and weaknesses of economy
(d) making our country on par with Finland
(e) None of these

51. The author seems to be in favour of
- (a) maintaining secrecy of budget
(b) judicious blend of secrecy and openness
(c) transparency in budget proposals
(d) replacement of public constitution by secrecy
(e) None of these
52. The secrecy of the budget is maintained by all of the following countries **except**
- A. Finland
B. India
C. United States
(a) Only A (b) Only B
(c) Only C (d) A and C
(e) B and C
53. Which of the following statements is definitely TRUE in the context of the passage?
- (a) The British Government has been religiously maintaining budget secrecy.
(b) Budget secrecy is likely to lead to corrupt practices.
(c) Consulting unjustifiable taxes with public helps make them accept those taxes.
(d) There should be no control on public expenditure in democratic condition.
(e) None of these
54. Sir Richard Clarke seems to deserve the credit for
- (a) transformation in the British budgetary techniques.
(b) maintenance of secrecy of the British budget.
(c) detection of abuse of transparency in budget.
(d) bringing down the tax load on British people.
(e) None of these
55. From the contents of the passage, it can be inferred that the author is
- (a) authoritarian in his approach.
(b) a democratic person.
(c) unaware of India's recent economic developments.
(d) a conservative person.
(e) None of these
56. For making the budget realistic, the Government should
- (a) refrain from making public the proposed provisions before finalisation.
(b) discuss it secretly within themselves.
(c) encourage the public to send in their suggestions.
(d) consult the public, defend their own plans and accept public suggestions.
(e) None of these

DIRECTIONS (Qs. 57-58) : Choose the word which is most nearly the SAME in meaning to the word printed in bold as used in the passage.

57. **SCOURGE**
 (a) ritual (b) presentation
 (c) whip (d) compromise
 (e) remedy
58. **MYRIAD**
 (a) adequate (b) functional
 (c) incompatible (d) abundant
 (e) excellent

DIRECTIONS (Qs. 59-60) : Choose the word which is most OPPOSITE in meaning to the word printed in bold as used in the passage.

59. **FLOURISHES**
 (a) disappears (b) degenerates
 (c) vanishes (d) blooms
 (e) opens
60. **DEBATED**
 (a) questioned severely
 (b) opposed strongly
 (c) accepted unconditionally
 (d) discussed frankly
 (e) implemented forcibly

DIRECTIONS (Qs. 61-68) : Read the following passage carefully and answer the questions given below it. Certain words have been printed in bold to help you locate them while answering some of the questions.

The Prime Minister's recent trip to Nigeria, the first bilateral prime ministerial visit to Africa since Jawaharlal Nehru's 45 years ago, recalls a long neglected Indian obligation. "It is up to Asia to help Africa to the best of her ability," Nehru told the Bandung Conference in 1955, "because we are sister continents. "The Prime Minister's proposed strategic partnership with African nations might at last make good that 52-year old promise and also, perhaps, challenge China's expedient diplomacy.

In the intervening years, the West's **sanctimonious** boycott of many African regimes - after nearly a century of extreme colonial exploitation - left the continent in the grip of oppressive rulers looking for new political sponsors, arms-sellers and trading partners. Not only was it an **abdication** of the developed world's responsibility to the world's least developed region, sanctions actually compounded the sufferings of poorer Africans. The Darfur killings continue and there is no mellowing of Robert Mugabe's repression in Zimbabwe.

Abandoned by the West Africa looked elsewhere. Beijing filled the vacuum by eagerly embracing dangerous and unsavoury regimes in its search for oil and other minerals. China demonstrated its influence by playing host to 48 out of 53 African leaders a year ago in a jamboree that was historic as well as historical. Historic because China has succeeded in becoming the pre-eminent outside power in Africa and its second biggest trading partner. Historical because modern Chinese diplomacy draws on the Middle kingdom's ancient formula; the tribute system. It was how the son of Heaven brought those nations whom the Celestial Empire

called "barbarians" into his imperial trading and, through it, cultural and political system.

Contemporary China's economic **penetration** of Africa also heralds a new era of cultural and political ties though the Chinese foreign ministry repeatedly assure the world that "our cooperation is not designed to be against or **preclude** any third party." This is untrue in a world of finite resources. Once the Chinese are established in a country, no one else gets a foothold. Myanmar, where India failed to obtain the desired gas concessions, is a prime example. Aware that the hunt for energy is a zero-sum game, China's leadership courts African leaders with regular visits and substantial grants.

After decades of neglect - Vajpayee's Africa visit over a decade ago was to attend a Commonwealth Summit - India will have to move cautiously but quickly if it is to break China's monopoly. Along with investing in Africa's human capital, China has outlined a strategic investment plan to build three to five trade economic cooperation zones in Africa by 2009 to boost trade, which is expected to tap \$40 billion this year. That could double to \$30 billion by 2010 on the back of an insatiable demand for natural resources to feed China's **booming** economy.

61. What was Jawaharlal Nehru's consideration for helping African nations?
 (a) The people in the continent were extremely backward
 (b) The Bandung Conference was held in African Continent
 (c) African Continent is emotionally related to Asian Continent
 (d) Nehru had promised the British rulers to help Africa after independence
 (e) The West had exploited African people
62. The example of Myanmar given by the author proves
 (a) that when China patronizes a country it does not allow other nations to enter
 (b) India's foresight to feed its growing hunger for energy
 (c) Myanmar's political acumen to have symbiosis with China
 (d) that a country's political wisdom does not necessarily establish economic stability
 (e) None of these
63. Which of the following is the author's suggestion to India to break the Chinese monopoly?
 (a) Move away cautiously but quickly from the African nations
 (b) Arrange P. M.'s regular visits to African countries
 (c) Outline a strategic plan of investment in the African countries
 (d) Plan for an increased economic help to African countries
 (e) None of these
64. From the contents of the passage, it can be inferred that the author's views are
 (a) in favour of India gaining an edge over China
 (b) against India's entering into a competition with China
 (c) in favour of not making any investment in African countries
 (d) appreciate of oppressive and barbaric African rulers
 (e) None of these

65. The author considers the claims of the Chinese Foreign Ministry regarding third party as
- just and worthy of trust
 - true but slightly exaggerated
 - too exorbitant to be true
 - an underestimate of the quality and quantity of their help
 - None of these
66. Which of the following best explains the term “ Middle kingdom’s ancient formula”?
- Rendering free hand for political, cultural & commercial upliftment
 - Influencing the underdeveloped countries through apparently patronizing policy
 - Referring the underdeveloped folks as barbarians and mistreating them
 - Becoming pre-eminent outside power and thus ruling over them
 - None of these
67. Which of the following was/were the reason(s) for the backwardness of African Nations?
- Mistreatment by the alien rulers
 - Tyrannical leaders governing the gullible masses
 - Exploitation and neglect by Western countries
- (1) and (2) only
 - (2) and (3) only
 - (1) and (3) only
 - None of these
 - All the three
68. China’s substantial grants to African countries are an act of
- China’s modern policy of rendering social service on humanitarian considerations
 - stepping up its campaign of universal brotherhood among nations
 - rendering selfless service to certain underdeveloped countries to beat the western countries
 - calculated selfish motive to fulfill its energy needs
 - None of these

DIRECTIONS (Qs. 69 -71) : Choose the word which is most OPPOSITE in meaning of the word given in bold as used in the passage.

69. CONTEMPORARY
- Fashionable
 - Modern
 - Current
 - Existing
 - Old
70. BOOMING
- striving
 - sounding
 - failing
 - thriving
 - degrading
71. PRECLUDE
- disqualify
 - permit
 - prevent
 - pre-empt
 - include

DIRECTIONS (Qs. 72 - 73) : Choose the word which is most nearly the SAME in meaning as the word given in bold as used in the passage.

72. SANCTIMONIOUS
- permissive
 - incongruent
 - poetic
 - holy
 - scrupulous
73. ABDICATION
- abandonment
 - obligation
 - instigation
 - addiction
 - spiritualization

DIRECTIONS (Qs. 74-81): Read the following passage carefully and answer the questions given below it. Certain words / phrases have been printed in bold to help you locate them while answering some of the questions.

Amartya Sen wrote about the Indian tradition of skepticism and heterodoxy of opinion that led to high levels of intellectual argument. The power sector in India is a victim of this tradition at its worst. Instead of **forcefully** communicating, supporting and honestly and firmly implementing policies, people just debate them. It is argued that central undertakings produce power at lower tariffs and must therefore build most of the required extra capacities. This is a **delusion**. They no longer have access to low-cost government funds.

Uncertainty about payment remains a reason for the hesitation of private investment. They had to sell only to SEBs (State Electricity Boards). SEB balance sheets are cleaner after the “securitisation” of the Rs 40,000 crore or so owed by SEBs to central government undertakings, now shown as debt instruments. But state governments have not implemented agreed plans to ensure repayment when due. The current annual losses of around Rs 28,000 crore make repayment highly uncertain. The central undertakings that are their main suppliers have payment security because the government will come to their help. Private enterprises do not have such assurance and are concerned about payment security, that must be resolved.

By the late 1990s, improving the SEB finances was recognised as fundamental to power reform. **Unbundling** SEBs, working under corporate discipline and even privatisation and not vertically integrated state enterprises, are necessary for efficient and financially viable electricity enterprises. Since government will not **distance** itself from managing them, privatising is an option. The Delhi model has worked. But it receives no public support.

The Electricity Act 2003, the APRDP (Accelerated Power Reform and Development Programme) with its incentives and penalties, and the creation of independent regulatory commissions, were the means to bring about reforms to improve financial **viability** of power sector. Implementation has been half-hearted and results disappointing. The concurrent nature of electricity in the Constitution **impedes** power sector improvement. States are more responsive to populist pressures than the central government, and less inclined to take drastic action against electricity thieves.

Captive power would add significantly to capacity. However, captive generation, three years after the Act enabled it, has added little to capacity because rules for open access were delayed. Redefined captive generation avoids state vetoes on purchase or sale of electricity except to state electricity enterprises. Mandating open access on state-owned wires to power regardless of ownership and customer would encourage electricity trading. The Act recognised electricity trading as a separate activity. A surcharge on transmission charges will pay for cross-subsidies. These were to be eliminated in time. Rules for open access and the quantum of surcharge by each state commission (under broad principles defined by the central commission) have yet to be announced by some. The few who have announced the surcharge have kept it so high that no trading can take place.

74. The author thinks it appropriate to
- discuss any policy in details and make it fool proof instead of implementing it hastily.
 - follow Indian tradition meticulously as skepticism is essential for major decisions.
 - divert our energies from fruitlessly contracting policies to supporting its implementation whole-heartedly.
 - intellectual arguments and conceptualisation of every policy is definitely better than its enforcement.
 - none of these
75. Why are the central undertakings not capable of generating power at low cost?
- Due to paucity of low-cost funds
 - Due to their access to Government funds
 - Due to their delusion about government funds
 - Because of their extra capacities
 - None of these
76. Which of the following is the reason for apathy of private investors in power sector?
- Their hesitation
 - Uncertainty of their survival
 - Cut-throat competition
 - Lack of guarantee of timely returns
 - None of these
77. What was the serious omission on the part of the State Government?
- Agreement for late recovery of dues
 - Reluctance to repay to private investors as per agreed plan
 - Non-implementation of recovery due to unplanned and haphazard policies
 - Lack of assurance from private enterprises
 - None of these
78. Which of the following is/are considered necessary for improving performance of electricity enterprises?
- Corporate work culture
 - Privatisation
 - Properly integrated state enterprises
- All the three
 - (a) and (b) only
 - (a) and (c) only
 - (b) and (c) only
 - None of these
79. The example of "Delhi Model" quoted by the author underlines his feelings of
- happiness about its success.
 - unhappiness for lack of public support
 - disgust towards privatisation.
- (a) and (b) only
 - (b) and (c) only
 - (a) and (c) only
 - All the three
 - None of these
80. Which of the following was/were not considered as the instrument(s) to accomplish financial well-being of power sector?
- The Electricity Act 2003
 - The APRDP with its incentives and penalties
 - Setting up of independent regulatory commissions
 - States vulnerability to populist pressures
 - Taking drastic action against electricity thieves.
81. Why were the results of the power sector reforms NOT as had been anticipated?
- The means to bring about reforms were illconceived.
 - The enforcement of the reform means inadequate and apathetic.
 - The Act and the reform measures were contradicting with each other.
 - The incentives on the one hand and penalties on the other created dissatisfaction.
 - None of these
- DIRECTIONS (Qs. 82-83): Choose the word or group of words which is most nearly the SAME in meaning as the word printed in bold.**
82. **DELUSION**
- proper understanding
 - wrong prediction
 - false belief
 - unkind propaganda
 - unrealistic optimism
83. **VIABILITY**
- ability to reform
 - ability to meditate
 - power to bounce
 - ability to spend
 - capability to survive
- DIRECTIONS (Qs. 84-85): Choose the word or group of words which is most OPPOSITE in meaning of the word printed in bold.**
84. **IMPEDE**
- interferes
 - grows
 - excels
 - promotes
 - exaggerates
85. **UNBUNDLING**
- disorganising
 - reorienting
 - segregating
 - winding
 - integrating
- DIRECTIONS (Q. 86-93) Read the following passage carefully and answer the questions given below it. Certain words/phrases have been printed in bold to help you locate them while answering some of the questions.**
- In February 2010 the Medical Council of India announced a major change in the regulation governing the establishment of medical colleges. With this change, corporate entities were **permitted** to open medical colleges. The new regulation also

carried the following warning : “permission shall be withdrawn if the colleges resort to commercialization”. Since the regulation does not elaborate on what constitutes “resorting to commercialization”, this will presumably be a matter left to the discretion of the Government.

A basic requirement for a new medical college is a pre-existing hospital that will serve as a teaching hospital. Corporate entities have hospitals in the major metros and that is where they will have to locate medical colleges. The earlier mandated land requirement for a medical college campus, a minimum of 25 acres of contiguous land, cannot be fulfilled in the metros. Not surprisingly, yet another tweak has been made in the regulation, prescribing 10 acres as the new minimum campus size for 9 cities including the main metros. With this, the stage is set for corporate entities to enter the medical education market.

Until now, medical education in India has been projected as a not-for-profit activity to be organised for the public good. While private bodies can run medical colleges, these can only be societies or trusts, legally non-profit organizations. In opening the door to corporate colleges, thus, a major policy change has been effected without changing the law or even a discussion in Parliament, but by simply getting a **compliant** MCI to change the regulation on establishment of medical colleges. This and other changes have been justified in the name of addressing the shortage of doctors. At the same time, over 50 existing medical colleges, including 15 run by the government, have been prohibited from admitting students in 2010 for having failed to meet the basic standards prescribed. Ninety per cent of these colleges have come up in the last 5 years. Particularly **shocking** is the phenomenon of government colleges **falling short** of standards approved by the Government. Why are state government institutions not able to meet the requirements that have been approved by the central government ? A severe problem faced by government-run institutions is attracting and retaining teaching faculty, and this is likely to be among the major reasons for these colleges failing to satisfy the MCI norms. The crisis building up on the faculty front has been **flagged** by various commissions looking into problems of medical education over the years.

An indicator of the crisis is the attempt to conjure up faculty when MCI carries out inspections of new colleges, one of its regulatory functions. Judging by news reports, the practice of presenting fake faculty – students or private medical practitioners hired for the day – during MCI inspections in private colleges is common. What is interesting is that even government colleges are adopting **unscrupulous** methods. Another indicator is the extraordinary scheme, verging on the ridiculous that is being put in place by the MCI to make inspections ‘foolproof’. Faculty in all medical colleges are to be issued an RFID-based smart card by the MCI with a unique Faculty Number. The card, it is argued, will eliminate the possibility of a teacher being shown on the faculty of more than one college and establish if the qualifications of a teacher are genuine. In the future, it is projected that biometric RFID readers will be installed in the colleges that will enable a Faculty Identification, Tracking and Monitoring System to monitor faculty from within the college and even remotely from MCI headquarters.

The picture above does not even start to reveal the true and pathetic situation of medical care especially in rural India. Only a fraction of the doctors and nursing professionals serve rural areas where 70 per cent of our population lives. The Health Ministry, with the help of the MCI, has been active in proposing yet another ‘innovative’ solution to the problem of lack of doctors in the rural areas. The proposal is for a three-and-a-half year course to obtain the degree of Bachelor of Rural Medicine and Surgery (BRMS). Only rural candidates would be able to join this course. The study and training would happen at two different levels – Community Health Centers for 18 months, and sub-divisional hospitals for a further period of 2 years – and be conducted by retired professors. After completion of training, they would only be able to serve in their own state in district hospitals, community health centres, and primary health centres.

The BRMS proposal has invited **sharp** criticism from some doctors’ organizations on the grounds that it is discriminatory to have two different standards of healthcare – one for urban and the other for rural areas, and that the healthcare provided by such graduates will be compromised. At the other end is the opinion expressed by some that “something is better than nothing”, that since doctors do not want to serve in rural areas, the government may as well create a new cadre of medics who will be obliged to serve there. The debate will surely pick up after the government formally lays out its plans. What is apparent is that neither this proposal nor the various stopgap measures adopted so far address the root of the problem of healthcare.

The far larger issue is government policy, the low priority attached by the government to the social sector as a whole and the health sector in particular, evidenced in the paltry allocations for maintaining and upgrading medical infrastructure and medical education and for looking after precious human resources.

86. What solution is being offered by the Health Ministry for the shortage of doctors in rural areas ?
 - (a) Increase the number of government run hospitals in the rural areas thereby increasing the number of doctors catering to the people in these regions.
 - (b) Make it mandatory for doctors serving in the urban areas to serve in the rural areas for a specific number of years
 - (c) Set up increasing number of community health centres in rural areas
 - (d) Hire retired professors of medicine to offer medical help to people living in the rural areas till the time more doctors are appointed
 - (e) Run a separate medical course for three and a half years which can be taken up only by rural candidates who would ultimately serve in the rural areas
87. Why have some existing medical colleges been prohibited from admitting students ?
 - (a) As these have adopted corrupt practices and have been taking huge donations from their students
 - (b) As all these colleges were illegally set up and were not approved by the government in the first place
 - (c) As the course offered by these colleges is not in line with the course offered by the government run colleges

- (d) As these have failed to meet the norms set by the central government for running the college
- (e) As there are absolutely no faculty members left in these colleges to teach students
88. Which of the following is/are the change/s announced by the MCI in the regulation governing the establishment of medical college?
- (A) Allowing the commercialization of medical colleges.
 (B) Reducing the earlier mandated land requirement for a medical college campus for metros.
 (C) Allowing corporate bodies to open medical colleges.
- (a) Only (B) (b) Only (A) and (B)
 (c) Only (C) (d) Only (B) and (C)
 (e) All (A), (B) and (C) are true
89. Which of the following are the different opinions regarding the BRMS proposal ?
- (A) At least a small step has been taken to improve the healthcare facilities in the rural areas through this proposal.
 (B) There should be uniform healthcare facilities available for people living in both rural and urban areas.
 (C) The healthcare providers through this proposal would not be up to the mark.
- (a) Only (A) (b) Only (A) and (B)
 (c) Only (B) and (C) (d) Only (B)
 (e) All (A), (B) and (C)
90. Which of the following is possibly the most appropriate title for the passage ?
- (a) Healthcare in India – The Questionable Changes
 (b) Medical Centres in Rural India
 (c) Commercialization of Medical Education in India
 (d) The Medical Council of India
 (e) The BRMS Proposal – The Way Out for Rural India
91. What is one of the major problems faced by the government-run medical institutions ?
- (a) Dearth of land required for the setting up of medical institutions
 (b) Lack of funds for running the colleges
 (c) Dearth of teaching faculty
 (d) Excessive competition from colleges run by corporate bodies
 (e) Dearth of students opting for these colleges
92. What is the idea behind the MCI putting in place the RFID-based smart card ?
- (A) To monitor and track faculty from MCI headquarters in the future.
 (B) To put a stop to the practice of colleges of presenting fake faculty members.
 (C) To verify the authenticity of faculty member qualifications.
- (a) Only (A) and (B) (b) All (A), (B) and (C)
 (c) Only (C) (d) Only (B) and (C)
 (e) Only (B)
93. What is the author's main intention behind writing this passage ?
- (a) To make the general public aware of the healthcare facilities available in India
 (b) To bring to light the problems faced by the healthcare sector in India despite changes suggested and goad the government into attaching priority to the sector
 (c) To bring to light the problems faced by rural people in terms of healthcare facilities and thus exhort urban doctors to serve in the rural areas
 (d) To make the general public aware of the benefits arising from the changes brought about by the MCI in the healthcare sector
 (e) To urge the corporate bodies to look into the matter of healthcare facilities in the rural areas
- DIRECTIONS (Q. 94–97) Choose the word/group of words which is most similar in meaning to the word/group of words printed in bold as used in the passage.**
94. FLAGGED
- (a) highlighted (b) stopped
 (c) bannered (d) caused
 (e) hoisted
95. FALLING SHORT
- (a) remaining tiny (b) limiting
 (c) stumbling upon (d) just satisfying
 (e) not meeting
96. PERMITTED
- (a) forbidden (b) pressed
 (c) allowed (d) sent
 (e) forced
97. SHOCKING
- (a) wicked (b) pleasing
 (c) appalling (d) electrifying
 (e) scandalous
- DIRECTIONS (Q. 98–100) Choose the word/group of words which is most opposite in meaning to the word/ group of words printed in bold as used in the passage.**
98. UNSCRUPULOUS
- (a) corrupt (b) even
 (c) constant (d) honest
 (e) measured
99. SHARP
- (a) mild (b) thin
 (c) blunt (d) rounded
 (e) pointed
100. COMPLIANT
- (a) fixed (b) unyielding
 (c) stagnant (d) obedient
 (e) negative

DIRECTIONS (Qs. 101-110) : Read the following passage carefully and answer the questions given below it. Certain words/phrases in the passage are printed in bold to help you locate them while answering some of the questions.

Nature is an infinite source of beauty. Sunrise and sunset, mountains and rivers, lakes and glaciers, forests and fields provide joy and bliss to the human mind and heart for hours together. Everything in nature is splendid and divine. Everyday and every season of the year has a peculiar beauty to **unfold**. Only one should have eyes to behold it and a heart to feel it like the English poet William Wordsworth who after seeing daffodils said, and then my heart with pleasure fills and dances with the daffodils?.

Nature is a great teacher. The early man was thrilled with beauty and wonders of nature. The Aryans worshipped nature. One can learn the lessons in the vast school of nature.

Unfortunately the strife, the stress and the tension of modern life have made people immune to beauties of nature. Their life is so full of **care** that they have no time to stand and stare. They cannot enjoy the beauty of flowing rivers, swinging trees, flying birds and majestic mountains and hills. There is, however, a cry to go back to village from the concrete and artificial jungle of cities. Hence the town planners of today pay special attention to provide enough number of natural scenic spots in town planning. To develop a balanced personality, one needs to have a healthy attitude which can make us appreciate and enjoy the beauty of nature.

There is other balm to soothe our tired soul and listless mind than the infinite nature all around us. We should enjoy it fully to lead a balanced and harmonious life, full of peace and tranquility.

101. Which of the following words has the SAME meaning as the word **care** as used in the passage ?
- (a) Grief (b) Want
(c) Needs (d) Pleasure
(e) Prejudices
102. Choose the word which is most OPPOSITE in meaning of the word **unfold** as used in the passage?
- (a) Declare (b) Conceal
(c) Describe (d) Perpetuate
(e) Evolve
103. Which of the following statements is not made in the passage about Nature?
- (a) Nature is an infinite source of beauty
(b) Everything in nature is splendid and divine
(c) Nature is a great teacher
(d) The Aryans worshipped Nature
(e) The early man was scared of Nature
104. What is needed to develop balanced personality?
- (a) Interpersonal skills (b) Reading poetry
(c) Healthy attitude (d) Going back to villages
(e) None of these
105. Why do people not enjoy the beauty of Nature ?
- (a) They are running after material pleasures
(b) They do not consider nature as balm to soothe their tired minds
(c) Their life is full of worries and tensions
(d) They are afraid of nature
(e) None of these

106. What should we do to enjoy tranquil life ?
- (a) Get totally immersed in our daily routine
(b) Believe that nature is infinite source of beauty
(c) Lead a disciplined and dedicated life
(d) Enjoy the nature around us
(e) Form a habit of daily physical exercise
107. What are the town planners doing today?
- (a) Providing facilities for enjoying nature
(b) Establishing balance between concrete and artificial jungle of cities
(c) Supporting the cry to go back to villages
(d) Making efforts to inculcate healthy attitude among people
(e) None of these
108. Choose the word which is most OPPOSITE in meaning of the word 'listless' as used in the passage
- (a) active (b) progressive
(c) backward (d) hidden
(e) impure
109. Choose the word which is most OPPOSITE in meaning of the word 'soothe' as used in the passage ?
- (a) stabilize (b) excite
(c) propagate (d) nature
(e) strengthen
110. According to the author of the passage, Nature
- (a) is the ultimate salvation of man
(b) is the creator of this universe
(c) brings uniformity in all seasons
(d) maintains homeostasis in human beings
(e) is abundantly glorious and divine

DIRECTIONS (Q. 111 to 120) Read the following passage carefully and answer the questions given below it. Certain words/phrases have been printed in bold to help you to locate them while answering some of the questions.

Once upon a time, there was a royal elephant which used to reside in the premises of the King's palace. The elephant was very dear to the king, so he was well-fed and well-treated. There was also a Dog who lived near the Elephant's shed. He was very weak and skinny. He was always fascinated by the smell of rich sweet rice being fed to the royal elephant.

One day, the Dog could no longer **resist** the aroma of the rice and somehow managed to sneak into the Elephant's shed. He ate the grains of sweet rice that fell from the Elephant's mouth. He liked the rice so much, that he started going there daily to eat the rice. For days, the huge Elephant didn't notice the small dog as he was busy enjoying the delicious food. Gradually, the Dog grew bigger and stronger eating such rich food. Finally the Elephant noticed him and allowed him access to the food.

The Elephant enjoyed the company of the Dog and started sharing his food with him. They also started spending time with each other and soon became good friends. They ate together, slept together and played together. While playing, the Elephant would hold the Dog in his trunk and swing him back and forth. Soon neither of them was happy without the other. They became great friends and didn't want to be **separated** from each other.

Then one day, a man saw the Dog and asked the Elephant-keeper, "I want to buy this Dog. What price do you want for it?" The Elephantkeeper didn't own the Dog but sold it and **extracted** a sum of money from this deal. The man took the Dog to his home village, which was quite far away. The King's Elephant became very sad after this incident. He missed his friend a lot and started neglecting everything. He didn't want to do anything without his dear friend so he stopped eating, drinking and even bathing.

Finally, the Elephant-keeper reported this to the King; however he didn't mention anything about the Dog. The King had a wise minister, who was known for his **keen** understanding of animals. The King ordered the minister, "Go to the Elephant shed and find out the reason for the Elephant's condition". The intelligent minister went to the Elephant shed and found the elephant very sad. He examined the Elephant and asked the Elephant-keeper, "There is nothing wrong with this Elephant's body, then why does he look so sad? I think this Elephant is grief stricken, possibly due to the loss of a dear friend. Do you know if this Elephant shared a close friendship with anyone?"

The Elephant-keeper said, "There was a Dog who used to eat, sleep and play with the Elephant. He was taken by a stranger three days ago". The minister went back to the King and said, "Your majesty, in my opinion, the royal Elephant is not sick, but he is lonesome without his dear friend, the Dog". The King said, "You're right, friendship is one of the most wonderful things of life. Do you know where the Dog is?" The Minister replied, "Elephantkeeper has informed me that a stranger took him away and he doesn't know his whereabouts". The King asked, "How can we bring back my Elephant's friend and make him happy again?" The Minister suggested, "Your Majesty, make a **declaration**, that whoever has the dog that used to live at the royal Elephant's shed will be penalized". The King did the same and the man who had taken the dog, instantly turned him loose when he heard the proclamation.

As soon as he was freed, the Dog ran back as fast as he could to the Elephant's Shed. The Elephant was so delighted to see the Dog that he picked his friend up with his trunk and swung him back and forth. The Dog wagged his tail, while the Elephant's eyes sparkled with happiness. The King was content to see the Elephant happy once again and rewarded the minister for his wise judgement.

111. What was the Minister's diagnosis of the Elephant's condition ?
- The Elephant hated his keeper
 - The Elephant was lonely
 - The Elephant was starving
 - The Elephant had hurt his leg and was in pain
 - None of these
112. What method did the Minister suggest to the King to get back the Dog ?
- To declare that whoever had that particular Dog would be punished
 - To keep a bowl of rice for the Dog in the Elephant's shed so that he could be lured back to the palace
 - To command the Elephant-keeper to look for the Dog in the village
 - To persuade the Elephant to call out to the Dog
 - None of these
113. Why had the Elephant become very sad ?
- He no longer got his daily bowl of rice
 - He was unhappy with the King for having sold the Dog
 - He missed his friend the Dog
 - He was sold to an unknown man by his keeper
 - None of these
114. What did the Elephant-keeper do to the Dog ?
- He sold the Dog to an unknown man for a price
 - He hit the Dog as the Dog was eating the Elephant's food
 - He killed the Dog
 - He complained to the King about the Dog
 - None of these
115. Which of the following would be the most appropriate title for the passage ?
- Friends and Enemies
 - The Playful Dog
 - The King and the Minister
 - The Elephant-keeper
 - The Bond of Friendship
116. Why was the Elephant taken care of ?
- He was a very special Elephant as he could talk to Dogs
 - He was a very loyal Elephant
 - He was the strongest Elephant in the Kingdom
 - He was weak and the King had a lot of sympathy for him
 - None of these
117. Why did the Dog start going to the Elephant's shed everyday ?
- He liked the Elephant a lot and wanted to become friends with him
 - He was being fed by the King everyday
 - He was fond of the Elephant's shed
 - He liked the taste of the rice being fed to the Elephant
 - None of these
118. What did the Dog do once he was set free ?
- He ate rice to his heart's content
 - He thanked the King for his kindness
 - He ran away from the Kingdom to a place faraway
 - He ran back to his friend the Elephant
 - None of these
119. What of the following can definitely be said about the Elephantkeeper ?
- He was greedy.
 - He was insensitive.
 - He was brave.
- Only 1
 - Only 2
 - Only 1 and 2
 - Only 2 and 3
 - All 1, 2 and 3
120. Which of the following can definitely be said about the King ?
- He was compassionate.
 - He was deceitful.
 - He loved animals.
- Only 1
 - Only 1 and 3
 - Only 1 and 2
 - Only 2
 - All the three 1, 2 and 3

DIRECTIONS (Q. 121 to 123): Choose the word/group of words which is most similar in meaning to the word/group of words printed in bold as used in the passage.

121. EXTRACTED

- (a) pulled (b) inserted
(c) wring (d) dug out
(e) received

122. DECLARATION

- (a) pact (b) praise
(c) announcement (d) writ
(e) resolve

123. KEEN

- (a) shallow (b) urgent
(c) concentrated (d) deep
(e) eager

DIRECTIONS (Q. 124 and 125): Choose the word/group of words which is most opposite in meaning to the word/group of words printed in bold as used in the passage.

124. RESIST

- (a) give in (b) please
(c) struggle (d) try out
(e) defy

125. SEPARATED

- (a) stuck (b) united
(c) estranged (d) bound
(e) joined

DIRECTIONS (Q. 126–135) Read the following passage carefully and answer the questions given below it. Certain words are printed in bold to help you to locate them while answering some of the questions.

A pundit was visiting a remote town. The people of the town worried him everyday with invitations for lunch or dinner. "I will only eat in a house where no one has ever told a lie," said the pundit. A very rich man stepped up and said, "Come to my house, Oh master. No one in my home has ever told a lie." The pundit accepted the invitation. Before going to the rich man's house, the pundit inquired about the rich man and learned everything he could about him. Walking along with the rich man, the pundit asked, "How many children do you have?" "Only one son," replied the rich man. "The people of this town said he had three sons! Why is he saying he has only one? Is he lying?" wondered the pundit, "but I should not be too hasty to judge him. Perhaps he is telling the truth. Let me wait." "How old are you now?" asked the pundit. "I am ten years old," answered the rich man. "There he goes again! His hair is gray, his face has wrinkles, he can **barely** walk, and he says he is only ten years old! No, No. I should not come to a rushed conclusion. I shall give him one more chance," decided the pundit. "How many acres of land do you have?" asked the pundit, "I have only six feet of land for myself", said the rich man. "This is like trying to hide a whole pumpkin in a spoonful of rice!" thought the pundit. "This man is indeed the king of liars! How can I eat in his house? Will it turn me into a liar as well? Let me see how far he can go."

When they arrived at the house the rich man told his wife, we have a **special** guest today so make him your best lunch. I will take him to the lake for a walk. We will be back soon. On their way back from the river, they passed an orchard. The rich man plucked

two ripe mangoes, and cut a bunch of ripe bananas. "Whose orchard is this?" asked the pundit. "This orchard belongs to the ones who do not sleep a wink at night," replied the rich man. At the house, the rich man's wife had laid out the lunch. "Please come and eat" she said. "I need to **clarify** a few things first," declared the pundit. "What is it?" asked the rich man. "I know you have three sons, why did you say you had only one?" demanded the pundit. The rich man immediately called for his sons and gave them a task. The eldest and the youngest both said, "Father, you are forever ordering us around". Only the middle son promptly agreed to obey. "Did you see that, Oh Master?" asked the rich man. "I do have three sons, but only one of them truly listens to me." "Fine, but why did you claim that you were only ten years old?" asked the pundit. "I am over sixty," replied the rich man. "But for the last ten years, I have devoted myself to a spiritual life. I believe that it is only then since I have truly lived," replied the rich man.

Excellent answer applauded the pundit. "But you own thousands of acres of fertile land. Why did you claim to have only six feet?" "I have acquired thousands of acres of land. I did every trick in the trade to become rich, but it has only made my sons proud and arrogant. What use is all this wealth to me? When I die, the six feet of land where I will be buried is all that will truly be mine," said the rich man.

The pundit sat down to eat. As he was taking his leave, he asked the rich man, "What did you mean when you said the orchard belongs to the ones who do not sleep a wink at night?" "I do own the orchard and work hard **tending** to my trees, but at night, I am so **tired** that I fall asleep. Meanwhile the thieves, who stay awake all night, steal most of my yield. So in truth the orchard belongs to them. The ones who do not sleep a wink at night" said the rich man.

126. On what condition did the pundit agree to invitations for lunch or dinner?

- (a) He would only eat from a rich man's plate.
(b) He would only eat in a house where no one had lied.
(c) He would eat in a house that cooked only vegetarian food.
(d) He would only eat from a banana leaf.
(e) None of these

127. Which of the following is said to be true of the rich man?

1. The rich man had three sons.
2. The rich man was fifty years old.
3. The rich man owned vast acres of land.
(a) Only 1 (b) Only 2
(c) Only 3 (d) Only 1 and 2
(e) Only 1 and 3

128. What was the rich man trying to imply when he said that he was only ten years old?

- (a) He had a near death experience ten years ago.
(b) The rich man was trying to appear younger than his actual age.
(c) He had truly lived only after he devoted himself to spiritual life.
(d) The rich man was trying to convey his innocence to the pundit.
(e) The rich man wanted the pundit to know that he was still a child at heart.

129. In the passage, why did the rich man say that he had only six feet of land, when he owned the whole orchard ?
- He did not want the pundit to know that the orchard belonged to him.
 - The orchard was distributed equally among his sons and he had only six feet for himself.
 - He believed that when he died, he would have only six feet of land that would truly be his.
 - The land that was productive in the whole orchard was only six feet long.
 - The orchard belonged to his ancestors and only six feet was rightfully his.
130. In the passage, what did the pundit imply by using the phrase trying to hide a pumpkin in a spoonful of rice ?
- That only pumpkin and rice was served for dinner.
 - That the rich man was a liar.
 - That the rich man grew only pumpkins in his orchard.
- Only 1
 - Only 2
 - Only 3
 - Only 1 and 2
 - Only 2 and 3
131. What did the rich man mean when he said that the orchard belonged to the ones who do not sleep a wink at night ?
- The orchard belonged to his sons who looked after it.
 - The orchard belonged to the thieves who robbed from it.
 - The owls looked after the orchard during the night.
 - The orchard belonged to the neighbours.
 - The orchard was donated to charity.
132. Why was the pundit hesitant to eat at the rich man's house ?
- The pundit was not accustomed to having rich food.
 - He felt that the rich man was proud and a two-faced human being.
 - The rich man's sons were not at home for lunch.
 - He did not want to cause any trouble to the rich man's wife.
 - He felt that the rich man lied to him.
133. Why did the pundit feel that the rich man was lying ?
- The pundit was spying on the rich man.
 - The pundit had inquired and learned about the rich man prior to the lunch.
 - The rich man was avoiding certain questions asked by the pundit.
 - The pundit found it hard to believe that the rich man never lied.
 - The rich man had too many secrets.
134. The rich man claimed to have only one son because—
- His middle son was the only child who obeyed him.
 - His eldest and youngest sons had long been married.
 - He had adopted his other two sons.
 - He did not want to introduce his eldest and youngest sons to the pundit.
 - He only loved his second son, who was taking care of him.
135. Why did the pundit agree to eat at the rich man's house ?
- The rich man claimed to have never told a lie.
 - The rich man was an old friend of the pundit.
 - The rich man could afford to treat the pundit.
 - The rich man owed the pundit a favour.
 - The pundit travelled a long distance and he was tired.
- DIRECTIONS (Q. 136–138) Choose the word which is most nearly the same in meaning as the word printed in bold as used in the passage.**
136. Tending
- | | |
|------------------|---------------|
| (a) Growing | (b) Supplying |
| (c) Watching | (d) Attending |
| (e) Contributing | |
137. Clarify
- | | |
|--------------|--------------|
| (a) Confirm | (b) Explain |
| (c) Simplify | (d) Describe |
| (e) Express | |
138. Barely
- | | |
|----------------|------------|
| (a) Easily | (b) Hardly |
| (c) Scantly | (d) Poorly |
| (e) Completely | |
- DIRECTIONS (Q. 139–140) Choose the word which is most opposite in meaning of the word printed in bold as used in the passage.**
139. Tired
- | | |
|---------------|---------------|
| (a) Drained | (b) Sleepy |
| (c) Relaxed | (d) Energised |
| (e) Exhausted | |
140. Special
- | | |
|--------------|---------------|
| (a) Unique | (b) Exclusive |
| (c) Rare | (d) Important |
| (e) Ordinary | |
- DIRECTIONS (Q. 141–150) Read the following passage carefully and answer the questions given below it. Certain words are printed in bold to help you to locate them while answering some of the questions.**
- The Sun, while going on his daily rounds saw a princess and fell in love with her. Whenever he could slip away from the heavens he would take human form and go down to the princess to spend some time with her. The princess too became quite fond of him and would wait for him to come. One day the Sun decided to send her a blood-red ruby as a token of his love for her. He put the gem in a silk bag, and calling a crow that was flying past, asked the bird to deliver the gem to his beloved. Crows had milky white feathers in those days and it was considered **auspicious** if a crow came anywhere near you. So the Sun was pleased that he had found a crow to deliver the gem. As the crow sped through the sky with the silken bag, the aroma of food lured him. Looking down the crow saw that a wedding feast was in progress, and immediately it was distracted from its mission. Food was one thing it could never resist !
- Alighting on a tree nearby, it hung the bag on a twig and went off to find some food. While the crow was feasting, a merchant passing by saw the bag on the tree, and knocked it down with a pole. When he opened the bag and saw its contents he almost swooned in joy. Quickly pocketing the ruby, he filled

the bag with dry cow dung that was lying there, and then **deftly** returned the bag to the branch. It was all done so quickly that the crow missed all the action. After having its fill, it flew up to the tree, and picking up the bag took it to the person it was intended for. The princess was in the garden. When the crow gave her the bag, she took it eagerly, knowing that it was from the Sun. But when she saw its contents she reeled back in shock and anger. Believing that it was the Sun's way of telling her that he did not care for her, she flung the bag away, rushed to her palace, and never came out again. When the Sun learnt of what had happened he was **furious**.

So great was his anger that when he turned his **scorching** gaze on the crow, its feathers were burned black. Its feathers have been black ever since. The ruby did not stay with the man who stole it. It fell out of his pocket and rolled into a deep pit. Men have been trying to dig it out ever since. Many precious stones have been found in the process, making Myanmar one of the richest sources of rubies and sapphires, but the ruby that the Sun sent to the princess is yet to be found.

141. What did the Sun send for the princess as a token of his love ?
- He sent her the crow
 - He sent her dry cow dung
 - He sent her a red ruby
 - He gifted her the city of Myanmar
 - None of these
142. Why did the princess fling the gift away ?
- She did not like rubies
 - The crow was known to bring bad luck
 - She had found cow dung in the bag
 - She thought the Sun was playing a cruel joke on her
 - She had wanted the Sun to personally deliver it
143. What led to the discovery of precious stones in Myanmar ?
- Humans discovered the stones in their search for the lost ruby
 - The crow spread the news of the lost ruby
 - The princess went in search of the lost ruby and discovered other precious stones
 - The merchant went in search of the ruby that fell off his pocket
 - The merchant's clumsiness led to the discovery of precious stones
144. While on its way to the princess, the crow was distracted by—
- The merchant calling out to him
 - The wedding that was taking place below
 - The ruby that the Sun sent for the princess
 - The temptation of the smell of food
 - The huge crowd at the wedding
145. Why did the Sun send his gift for the princess along with the crow?
- The princess loved crows
 - The crow was the only bird available at the time
 - The crow was considered to be an auspicious bird
 - The crow knew where the princess lived
 - The Sun trusted the crow
146. The joy of the merchant on finding the ruby was short lived because—
- He did not succeed in stealing the ruby
 - The ruby fell out of his pocket
 - The crow returned just in time and caught him red handed
 - He soon discovered many more precious stones
 - None of these
147. How did the crow get its black colour ?
- The crow was punished by the Sun for its clumsiness
 - The crow was burned black by the scorching gaze of the angry Sun
 - The crow was not considered auspicious any more
 - The crow was cursed by the merchant
 - None of these
148. What could be an appropriate title for the story ?
- The Careless Black Crow
 - Myanmar and its Mineral Riches
 - The Sun and the Princess
 - The Depressed Princess
 - The Sun and the Ruby
149. What was the crow's mission ?
- To deliver the gift to the princess
 - To attend the wedding
 - To make the Sun angry
 - To keep the princess in her palace
 - To protect the princess from the harmful Sun
150. What message did the princess get after opening the bag ?
- That the Sun truly loved her
 - That the crow was an evil bird
 - That the crow was playing a joke on her
 - That the Sun did not love her anymore
 - That the cow dung was a token of the Sun's love for her

DIRECTIONS (Q. 151–153) Choose the word which is most nearly the SAME in meaning as the word printed in bold as used in the passage.

151. Token
- | | |
|----------------|---------------|
| (a) Symbol | (b) Insurance |
| (c) Slip | (d) Assurance |
| (e) Investment | |
152. Deftly
- | | |
|----------------|----------------|
| (a) Skillfully | (b) Blindly |
| (c) Eagerly | (d) Rightfully |
| (e) Innocently | |
153. Auspicious
- | | |
|----------------|--------------|
| (a) Religious | (b) Lucky |
| (c) Fulfilling | (d) Charming |
| (e) Normal | |

DIRECTIONS (Q. 154–155) Choose the word which is most OPPOSITE in meaning of the word printed in bold as used in the passage.

154. Scorching
- | | |
|--------------|------------|
| (a) Cool | (b) Heated |
| (c) Warm | (d) Silent |
| (e) Composed | |
155. Furious
- | | |
|---------------|-----------|
| (a) Beaming | (b) Angry |
| (c) Forgiving | (d) Calm |
| (e) Sulking | |

DIRECTIONS (Q. 156-165) Read the following passage carefully and answer the questions given below it. Certain words are printed in bold to help you to locate them while answering some of the questions.

A fisherman, enfeebled with age, could no longer go out to sea so he began fishing in the river. Every morning he would go down to the river and sit there fishing the whole day long. In the evening he would sell whatever he had caught, buy food for himself and go home. It was a hard life for an old man. One hot afternoon while he was trying to keep awake and bemoaning his fate, a large bird with silvery feathers alighted on a rock near him. It was Kaha, the heavenly bird. "Have you no one to care for you, grandpa?" asked the bird. "Not a soul." "You should not be doing such work at your age," said the bird. "From now on I will bring you a big fish every evening. You can sell it and live in comfort." True to her word, the bird began to drop a large fish at his doorstep every evening. All that the fisherman had to do was take it to the market and sell it. As big fish were in great demand, he was soon rolling in money. He bought a cottage near the sea, with a garden around it and engaged a servant to cook for him. His wife had died some years earlier. He had decided to marry again and began to look for a suitable woman.

One day he heard the royal courtier make an announcement. Our king has news of a great bird called Kaha," said the courtier. "Whoever can give information about this bird and help catch it, will be rewarded with half the gold in the royal treasury and half the kingdom!" The fisherman was **sorely** tempted by the reward. Half the kingdom would make him a prince!

"Why does the king want the bird?" he asked. "He has lost his sight," explained the courtier. "A wise man has advised him to bathe his eyes with the blood of Kaha. Do you know where she can be found?" "No...I mean...no, no..." **Torn** between greed and his sense of gratitude to the bird, the fisherman could not give a coherent reply. The courtier, sensing that he knew something about the bird, informed the king. The king had him brought to the palace.

"If you have information about the bird, tell me," urged the king. "I will reward you handsomely and if you help catch her, I will personally crown you king of half my domain." "I will get the bird for you," cried the fisherman, suddenly making up his mind. "But Kaha is strong. I will need help." The king sent a dozen soldiers with him. That evening when the bird came with the fish, the fisherman called out to her to wait. "You drop the fish and go and I never get a chance to thank you for all that you've done for me," he said. "Today I have laid out a feast for you inside. Please alight and come in." Kaha was reluctant to accept the invitation but the fisherman pleaded so earnestly that she finally gave in, and alighted. The moment she was on the ground, the fisherman **grabbed** one of her legs and shouted to the soldiers hiding in his house to come out. They rushed to his **aid** but their combined effort could not keep Kaha down.

She rose into the air with the fisherman still clinging onto her leg. By the time he realised he was being carried away, the fisherman was too high in the air to let go. He hung on grimly, and neither he nor Kaha were ever seen again.

156. Why was the king desperately looking for Kaha the bird?
- The king wanted a pet bird.
 - A wise man advised the king to capture the bird for good luck.
 - Kaha was the only heavenly bird with silvery feathers.
 - The king was blind and required Kaha's blood for his eyes.
 - Kaha was known to be the greatest bird alive.
157. Why did the bird volunteer to bring fish for the old man?
- The old man was inexperienced at fishing.
 - The bird took pity on the old man and wanted to help him.
 - The bird had caught more fish than required.
 - The bird wanted to make the old man rich.
 - The bird had heard the old man bemoaning his fate.
158. What led the courtier to sense that the fisherman might know something about Kaha?
- The courtier had observed Kaha alight at the fisherman's house every evening.
 - The courtier had seen the fisherman talk to Kaha.
 - The fisherman fumbled when asked about Kaha.
 - Word went around that the fisherman was in contact with Kaha.
 - None of these
159. Which of the following cannot be said about the royal courtier?
- He was a very observant man.
 - He was jealous of the old fisherman.
 - He had informed the king about the fisherman.
- Only (1)
 - Only (2)
 - Only (3)
 - Only (1) and (3)
 - Only (2) and (3)
160. What could be an appropriate title for the story?
- A Fish a Day
 - The Lonely fisherman
 - Kaha the Silvery feathered bird
 - The Blind King
 - The Ungrateful old fisherman
161. Which of the following is not true about Kaha?
- Kaha was a very considerate bird.
 - The blood of Kaha was precious.
 - Kaha was a strong bird.
 - Kaha flew away along with the old fisherman.
 - Kaha saved the fisherman from the King's wrath.
162. Why did the fisherman stammer when asked if he knew about the bird?
- The fisherman thought he was going to be punished for living off the bird.
 - He was thrilled he would be able to help the king.
 - He already knew about the reward that was being offered.
 - He was conflicted between the king's reward and his gratitude towards the bird.
 - The fisherman was faced with a very unexpected question by a royal courtier.

163. How did the fisherman get Kaha to come down ?
- The fisherman told Kaha that the King was impressed by her kindness and wanted to meet her.
 - The fisherman invited Kaha to live in his house as he was a lonely man and wanted company.
 - The fisherman invited Kaha to his house for a feast in order to thank her for everything.
- Only (1)
 - Only (2)
 - Only (3)
 - Only (2) and (3)
 - Only (1) and (3)
164. What does the phrase 'rolling in money' as highlighted in the passage refer to ?
- To have a large amount of money.
 - To have just enough of money.
 - To live a life that is not affordable.
 - To live off someone else.
 - To be self-sufficient.
165. Why was the fisherman doubtful about revealing information about Kaha to the courtier ?
- He did not want to lose Kaha.
 - Kaha was his source of income.
 - He was worried about his supply of fish.
 - He had heard that kaha was going to be killed for her blood.
 - Kaha had asked the fisherman not to tell anyone about her whereabouts.

DIRECTIONS (Q. 166–168) Choose the word which is most nearly the SAME in meaning as the word printed in bold as used in the passage.

166. Aid
- Health
 - Help
 - Support
 - Freedom
 - Mercy
167. Sorely
- Happily
 - Painfully
 - Gainfully
 - Greatly
 - Primarily
168. Torn
- Conflicted
 - Alarmed
 - Frightened
 - Strained
 - Frayed

DIRECTIONS (Q. 169–170) Choose the word which is most OPPOSITE in meaning of the words/printed in bold as used in the passage.

169. Alight
- Settle
 - Take off
 - Come by
 - Rest
 - Free
170. Grabbed
- Caught
 - Released
 - Secured
 - Loosened
 - Held

DIRECTIONS (Q. 171–177) : Read the following passage carefully and answer the questions given below it. Certain words are printed in bold to help you to locate them while answering some of the questions.

Once upon a time in a village, there lived six blind men. In spite of their blindness, they had managed to educate themselves. Seeking to expand their knowledge, they decided to visit a zoo and try out their skills in recognizing animals by their touch. The first animal they came across, as soon as they entered the zoo, was an elephant.

As the first man approached the elephant, the elephant waved its trunk, and the man felt something brush past him. Managing to hold on to it, he felt it, and found something long and moving. He jumped back in alarm, shouting "Move away ! This is a snake !" Meanwhile, the second man had moved closer, and walked right near its legs. As the man touched the thick, cylindrical-shaped legs, he called out "Do not worry. These are just four trees here. There is certainly no snake !" The third man was curious hearing the other two, and moved forward. As he walked towards the elephant, he felt his hand touch one of the tusks. Feeling the smooth, sharp ivory tusk, the man cried out "Be careful ! There is a sharp spear here". The fourth man cautiously walked up behind the elephant, and felt its swinging tail. "It's just a rope ! There is nothing to be afraid of !" he said. The fifth man had meanwhile reached out and was touching the huge ears of the animal. "I think all of you have lost your sense of touch !" he said. "This is nothing but a huge fan !" The sixth man did not want to be left out. As he walked towards the elephant, he bumped into its massive body, and he exclaimed, "Hey ! This is just a huge mud wall ! There is no animal at all !" All six of them were **convinced** that they were right, and began arguing amongst themselves.

Wondering what the commotion was all about, the zoo keeper arrived at the scene, and was surprised to see six blind men surrounding an elephant, each of them shouting at the top of their voice ! "Quiet" he shouted out, and when they had calmed down, he asked, "Why are all of you shouting and arguing in this manner ?" They replied, "Sir, as you can see, we are all blind. We came here to expand our knowledge. We sensed an animal here, and tried to get an idea of its appearance by feeling it. However, we are not able to arrive at a **consensus** over its appearance, and hence are arguing. Can you please help us and tell us which of us is right" ?

The zoo keeper laughed before answering, "My dear men, each of you has touched just one portion of the animal. The animal you see is neither a snake, nor any of the other things you have mentioned. The animal in front of you is an elephant !" As the six men bowed their head, ashamed of the scene they had created, the zoo keeper said, "My dear men, this is a huge animal, and luckily, it is tame. It stood by calmly as each of you touched it. You are extremely lucky that it stayed calm even during your argument, for if it had got angry, it would have trampled all of you to death !" He continued further, "It is not enough to gather

knowledge, but it is also important to learn to share and pool your knowledge. Instead of fighting amongst yourselves, if you had tried to put all your observations together, you might have had an idea of the animal as a whole ! Also, when you cannot see the entire truth, it is better to go to someone who does know the complete truth, rather than guess about small parts of it. Such half knowledge is not only useless, but also dangerous. If you had come directly to me, I would have helped you identify all the animals without putting you in danger !” The six men apologized to the zoo keeper, and assured him that they had learnt their lesson. From now on, they would seek true knowledge from qualified people, and would also try to work together as a team so that they could learn more.

171. Which part of the elephant resembled a big fan ?

- (a) The wide ears
- (b) The mouth
- (c) The long slender trunk
- (d) The big wrinkled body
- (e) The end of the tail

172. Why did the six blind men visit the zoo ?

- (a) They wanted to touch an elephant
- (b) They had heard a lot about animals
- (c) They wanted to visit the animals in the zoo
- (d) They wished to recognize animals by their touch and feel
- (e) They had never been to a zoo before

173. What was the first thing the blind men came across as they entered the zoo ?

- (a) A large mud wall
- (b) The zoo keeper
- (c) The trees
- (d) The elephant
- (e) A snake

174. Why is it that each of the six blind men had different impressions of the elephant ?

- (A) Each of them touched only a portion of the elephant
 - (B) Each of the six blind men approached different animals
 - (C) The blind men were touching the surroundings instead of the elephant
 - (D) They had never touched an elephant before
- (a) Only (A)
 - (b) Only (A) and (C)
 - (c) Only (C)
 - (d) Only (B) and (D)
 - (e) Only (B)

175. Why were the six men arguing and shouting amongst themselves ?

- (a) Each of them wanted his voice to be heard over and above the others
- (b) Each of them thought he was right about the animal
- (c) There was a lot of noise in the zoo and they couldn't hear each other
- (d) They were having an interesting debate
- (e) None of these

176. What advice did the zoo keeper give to the six blind men ?

- (a) That the elephant was tame and obedient
- (b) That they were very lucky to have had the opportunity to visit the zoo
- (c) That it was important to share knowledge and work together as a team
- (d) That they were not qualified to be knowledgeable individuals
- (e) That the elephant is made up of different parts

177. Which statement best describes the zoo keeper's behaviour towards the six blind men ?

- (a) The zoo keeper insulted the six men
- (b) The zoo keeper presented himself to be as ignorant as they were
- (c) The zoo keeper helped them and assisted them further
- (d) The zoo keeper was indifferent towards the six blind men
- (e) The zoo keeper prohibited the six blind men from entering the zoo

DIRECTIONS (Q. 178–180) : Choose the word which is most nearly the same in meaning as the word printed in bold as used in the passage.

178. Convinced

- (a) certain
- (b) doubtful
- (c) pressured
- (d) committed
- (e) daring

179. Pool

- (a) expand
- (b) gather
- (c) devote
- (d) apply
- (e) combine

180. Consensus

- (a) harmony
- (b) agreement
- (c) information
- (d) order
- (e) inference

ANSWER KEY

1	(a)	20	(b)	39	(c)	58	(d)	77	(b)	96	(c)	115	(e)	134	(a)	153	(a)	172	(d)
2	(b)	21	(d)	40	(a)	59	(d)	78	(a)	97	(c)	116	(e)	135	(a)	154	(a)	173	(d)
3	(e)	22	(d)	41	(e)	60	(b)	79	(a)	98	(d)	117	(d)	136	(c)	155	(d)	174	(a)
4	(e)	23	(e)	42	(d)	61	(c)	80	(d)	99	(d)	118	(d)	137	(a)	156	(d)	175	(b)
5	(c)	24	(d)	43	(e)	62	(a)	81	(d)	100	(b)	119	(a)	138	(b)	157	(b)	176	(c)
6	(a)	25	(b)	44	(a)	63	(e)	82	(c)	101	(a)	120	(b)	139	(d)	158	(c)	177	(c)
7	(d)	26	(a)	45	(d)	64	(a)	83	(e)	102	(b)	121	(e)	140	(e)	159	(b)	178	(a)
8	(d)	27	(d)	46	(a)	65	(e)	84	(d)	103	(e)	122	(c)	141	(c)	160	(e)	179	(a)
9	(c)	28	(a)	47	(e)	66	(b)	85	(e)	104	(c)	123	(e)	142	(c)	161	(e)	180	(b)
10	(b)	29	(c)	48	(c)	67	(e)	86	(e)	105	(c)	124	(a)	143	(a)	162	(d)		
11	(e)	30	(b)	49	(c)	68	(d)	87	(d)	106	(d)	125	(b)	144	(d)	163	(c)		
12	(d)	31	(a)	50	(e)	69	(e)	88	(d)	107	(a)	126	(b)	145	(c)	164	(a)		
13	(c)	32	(a)	51	(b)	70	(e)	89	(c)	108	(a)	127	(e)	146	(b)	165	(c)		
14	(a)	33	(d)	52	(d)	71	(e)	90	(a)	109	(b)	128	(c)	147	(b)	166	(b)		
15	(b)	34	(b)	53	(e)	72	(e)	91	(c)	110	(e)	129	(c)	148	(c)	167	(d)		
16	(e)	35	(d)	54	(a)	73	(a)	92	(b)	111	(b)	130	(b)	149	(a)	168	(a)		
17	(d)	36	(e)	55	(b)	74	(c)	93	(b)	112	(a)	131	(b)	150	(d)	169	(b)		
18	(a)	37	(c)	56	(d)	75	(c)	94	(a)	113	(c)	132	(e)	151	(a)	170	(b)		
19	(d)	38	(c)	57	(c)	76	(d)	95	(e)	114	(a)	133	(b)	152	(a)	171	(a)		

ANSWERS & EXPLANATIONS

- (a) Ascertain the hidden meaning of the sentence. "but no one would be able to realise that a terrorist attack has occurred". So, undoubtedly the culprit's act can be classified as a terrorist attack.
- (b) "New terrorism has no long-term agenda but its ruthless in its short-term intentions". This statement from the passage supports (b). While in the light of passage, (c) also seems suitable.
- (e) The immediate provocation for the meeting held in August 1998 has not been given among the options. It was the incidents of bombing the U.S. embassies in Nairobi and Dar-es-Salaam.
- (e) Bio-attack will result in several deaths which will lead to political turmoil creating social unrest.
- (a) 'Religious intolerance', as cited in the last paragraph stands behind terrorism.
- (c) The meaning is implied in the last sentence.
- (a) The Japanese ambassador acknowledges that the vastness of the Indian market is a great inducement for investment in the manufacturing industry.
- (b) The author describes the Indian investment scenario in toto. He presents a comparative analysis regarding foreign investment in India.
- (e) Comparatively though labour is inexpensive in India, but at the same time productivity is not high. Therefore, it cannot be cited as an advantage here.
- (d) If foreign investment is to be wooed assiduously, we will have to meet exacting international standards.
- (a) The author is a political commentator because he talks about the government policy and makes various proposals regarding foreign investment in India.
- (b) The passage reflects the views of the Japanese ambassador who also talks about the problems faced by foreign investors in India.
- (b) Japanese business circles represented by the Ishikawa Mission called attention of their Indian counterparts in what they considered to be major impediments in India.
- (a) The Indian government put into effect revolutionary reforms to remove the hurdles.
- (a) India deserves a far bigger share of world trade considering its vast resources.
- (c) From the last paragraph of the given passage.
- (c) From the fourth line of the second paragraph.
- (e) In the last sentence of the second para.
- (d) Second and third para tells about Indian concept of life and treatment while the last para tells about western concept of life and knowledge about medical science.
- (e) It is clearly given in the last sentence of the passage "that contribution of the science in the field of non-communicable diseases is remarkably poor"

49. (c) Eminent British economists and political scientists have strongly attacked the tradition of budget secrecy.
50. (e) It leads to the control of public expenditure in order to set realistic taxation implications.
51. (b) He has presented the example of both the open budget system and the secret budget system, practised by various countries and has looked into all their aspects.
54. (a) Sir Richard Clarke was the originating genius of nearly every important development in the British budgeting techniques during the last two decades.
56. (d) An open public debate on budget proposals should be held before introducing the appropriate bill.
61. (c) "It is up to Asia to help Africa to the best of her ability" "Nehru told the Bandung conference in 1955, "because we are sister continents." These statements explain that African continent is emotionally related to Asian continent.
62. (a) Once the Chinese are established in a country, no one else gets a foothold. Myanmar, where India failed to obtain the desired gas concessions, is a prime example. These lines explain China's monopoly.
63. (e) None of the answer choices are author's suggestion to India to break the Chinese monopoly. In the passage the author only says that India will have to move cautiously but quickly if it is to break Chinese monopoly.
64. (a) Every where in the passage we find author favours India gaining an edge over China. Author throughout the passage is highlighting China's own perspective while they are helping the African's.
65. (e) According to the passage the Chinese foreign ministry repeatedly assure the world that "our co-operation is not designed to be against or preclude any third party". None of the answer choices matches author's consideration because the claims of China's foreign ministry are totally untrue.
66. (b) The terms "Middle kingdom's ancient formula" is used in the passage in context of China helping the African nations, embracing their dangerous regimes, influencing the under-developed countries through apparently patronizing policies.
67. (e) All the reasons are responsible for the backwardness of African Nations – The West's sanctimonious boycott of African regimes – after nearly a century of colonial exploitation — left the continent in the grip of oppressive rulers. These lines from passage explains the answer.
68. (d) China's selfish motive is highlighted in the following lines of the passage "Beijing filled the vacuum by eagerly embracing dangerous and unsavory regions in its search for oil and other minerals."
69. (e) The word *contemporary* means something which is presently in fashion so the opposite is old.
70. (e) The word *booming* means to grow, develop or progress rapidly, so the opposite would be degrading means to reduce to lower rank.
71. (e) The word *preclude* means to exclude from something which is the opposite of word include which means to involve.
72. (e) The word *sanctimonious* means making a hypocritical show of religion, devotion etc. which is similar to word scrupulous which means showing a strict regard for what one considers right.
73. (a) The word abdication means the act or state of abdicating or renunciation, it means to relinquish power or responsibility formally which is similar to word abandonment which means to leave completely or finally.
74. (c) The author wants us to stop debating and implement policies.
75. (c) Stated in the first paragraph.
76. (d) Uncertainty about payment is mentioned, hence option (d).
77. (b) Refer to the second paragraph. "State governments have not implemented agreed plans to ensure repayment when due..."
78. (a) All the factors are mentioned in the passage.
79. (a) Refer to the third paragraph. "The Delhi model has worked. But it receives no public support."
80. (d) Clearly, populist measures would go against financial wellbeing.
81. (d) It is stated in the passage that the enforcement of the reforms was inadequate.
82. (c) Delusion means "a false belief of opinion about yourself or your situation"
83. (e) The root word of viability is viable. Viable means "capable of developing and surviving independently"
84. (d) Impede means "delay or stop the progress of something."
85. (e) Unbundling is opposite of bundling means integrating.
101. (a) grief
102. (b) conceal
103. (e) The early man was scared of Nature
104. (c) healthy attitude
105. (c) Their life is full of worries and tensions
106. (d) Enjoy the nature around us
107. (a) Providing facilities for enjoying nature
108. (a) active
109. (b) excite
110. (e) is abundantly glorious and divine

CLOZE TEST

Cloze Test

Cloze tests are common in all bank exams. They usually require you to choose the correct choice out of four possibilities.

A cloze test (also cloze deletion test) is an exercise, test, or assessment consisting of a portion of text with certain words removed (cloze text), where the participant is asked to replace the missing words. Cloze tests require the ability to understand context and vocabulary in order to identify the correct words or type of words that belong in the deleted passages of a text.

Example 1 : A language teacher may give the following passage to students:

Today, I went to the _____ and bought some milk and eggs. I knew it was going to rain, but I forgot to take my _____, and ended up getting wet on the way _____.

Explanation : Students would then be required to fill in the blanks with words that would best complete the passage. Context in language and content terms is essential in most, if not all, cloze tests. The first blank is preceded by "the"; therefore, a noun, an adjective or an adverb must follow. However, a conjunction follows the blank; the sentence would not be grammatically correct if anything other than a noun were in the blank. The words "milk and eggs" are important for deciding which noun to put in the blank; "market" is a possible answer, depending on the student, however, the first blank could either be store, supermarket, shop or market while umbrella or raincoat fit the second.

Example 2 : I saw a man lay his jacket on a puddle for a woman crossing the street. I thought that was very _____.

Explanation : Given the above passage, students' answers may then vary depending on their vocabulary skills and their personal

opinions. However, the placement of the blank at the end of the sentence restricts the possible words that may complete the sentence; following an adverb and finishing the sentence, the word is most likely an adjective. Romantic, chivalrous or gallant may, for example, occupy the blank, as well as foolish or cheesy.

How to Tackle a Cloze Test

- Read the text through trying to understanding the general meaning.
- Look at each missing word gap and try to imagine what the correct word should be.
- Decide which part of speech (adjective, noun, gerund, etc.) needs to be used to fill each gap.
- Read the text again, trying to fill a gap as you come to it by imagining what the correct answer should be.
- Read the text another time, this time choose the correct answer from the five answers given.
- If you are unsure of any given answer, try reading the sentence with each of the possibilities.
- Try to eliminate the obvious false choices.
- Always think about the overall meaning of the text (i.e., whether the text is negative, positive, etc.) to make sure that your answer choice fits the context.
- Trust your intuition. If you feel a word is right instinctively, it probably is correct.

EXERCISE

Directions (Qs. 1-10) : In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fills the blank appropriately. Find out the appropriate word in each case.

Fourteen centuries ago when the world was much younger, the ruler of all India, Rajah Balhait, was(1).... about his people. A new game of dice, called hard, had ...(2) the imagination of his subjects, teaching them that chance alone-a-roll of the dice guided the ...(3) of men. All who played this game of fortune lost their ...(5) in the virtues of courage, prudence, wisdom and hope. It bred a fatalism that was ...(5) the spirit of the kingdom.

Raja Balhait commissioned Sissa, an intelligent courtier at his court to find an answer to this ...(6) After much ...(7) the clever Sissa invented another game. Chaturanga, the exact ...(8) of hard, in which the four elements of the Indian army were the key pieces. In the game these pieces-chariots, horses, elephants and foot soldiers-joined with a royal counselor to defend their king and defeat the enemy. Forceful ...(9) was demanded of the players? not luck. Chaturanga soon became more popular than hard, and the ...(10) to the Kingdom was over.

1. (a) concerned (b) confident
(c) ignorant (d) indifferent
(e) partisan
2. (a) propelled (b) enshrined
(c) captured (d) activated
(e) enhanced
3. (a) communities (b) ways
(c) abnormalities (d) destiny
(e) groups
4. (a) bravado (b) interest
(c) peace (d) wealth
(e) faith
5. (a) appalling (b) crushing
(c) moistening (d) promoting
(e) overwhelming
6. (a) apprehension (b) risk
(c) problem (d) game
(e) destiny
7. (a) deliberation (b) absorption
(c) insight (d) hesitation
(e) reluctance
8. (a) nature (b) equivalent
(c) picture (d) opposite
(e) replica
9. (a) prediction (b) concentration
(c) manipulation (d) attack
(e) fortune
10. (a) devastation (b) anxiety
(c) impeachment (d) nuisance
(e) threat

Directions (Q. 11-20) In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

When sound ...(11)..., the world of cinema, mime made a gracious exit. ...(12)... then, it stood proudly as a performing art in itself, independent and ...(13)... in style, approach, treatment and performance not matched however, by ...(14)... acceptance. During the silent era, actors in silent films had to ...(15)... totally on mime as the only way of ...(16)... their emotions, expressions, incidents, events and interactions between and among characters. German Expressionist cinema, the acting of classic performers like Charlie Chaplin, Harold Lloyd and Buster Keaton used mime they had ...(17)... as part of their theatrical ...(18)... in their films with great effect. A French mime artist once said, "Mime is the poetry of silence." But once talking ...(19)... entered the scenario, mime was ...(20)... ever used in films, even though a character introduced as a mime artist.

11. (a) entered (b) came
(c) saw (d) became
(e) featured
12. (a) From (b) So
(c) Since (d) By
(e) Until
13. (a) single (b) fair
(c) dependent (d) unique
(e) treacherous
14. (a) drama (b) conclusion
(c) opinion (d) judgement
(e) popular
15. (a) portray (b) act
(c) rely (d) depict
(e) earn
16. (a) mentioning (b) designing
(c) stimulating (d) expressing
(e) considering
17. (a) worked (b) learnt
(c) qualified (d) bought
(e) invested
18. (a) experience (b) showings
(c) vision (d) distance
(e) story
19. (a) toys (b) worlds
(c) films (d) people
(e) mimes
20. (a) and (b) hardly
(c) then (d) thus
(e) for

Directions (Q. 21 to 30) In the following passage there are blanks each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested one of which fits the blank appropriately. Find out the appropriate word in each case.

Once upon a time there was a prince who wanted to marry a princess; but she would have to be a real princess. He ... (21) ... all over the world to find one, but nowhere could he get what he wanted. One evening during a terrible storm; there was thunder and lightning, and the rain poured down in torrents. Suddenly a knocking was ... (22) ... at the palace door, and the old king went to open it. It was a princess standing out there. But, good gracious! What a sight the rain and the wind had made her look. The water ran down her hair and clothes; into the toes of her shoes and out again at the heels. And yet she insisted that she was a real princess. Well, we'll soon ... (23) ... out, thought the old queen. But she said nothing, went into the bedroom, took all the bedding off the bedstead, and ... (24) ... a pea on the bottom; then she took twenty mattresses and laid them on the pea, and then twenty quilts on ... (25) ... of the mattresses. On this the princess had to lie all night. In the ... (26) ... she was asked how she had slept. "Oh, very badly!" said she. "I scarcely closed my eyes all night. Heaven only knows what was in the bed, but I was lying on something hard, as a ... (27) ... I am black and blue all over my body. It's horrible!" Now they knew that she was a real princess because she had ... (28) ... the pea right through the twenty mattresses and the twenty quilts. Nobody but a real princess could be as ... (29) ... as that. So the prince took her for his wife, for now he ... (30) ... that he had a real princess.

21. (a) called (b) tour
(c) sent (d) saw
(e) travelled
22. (a) made (b) felt
(c) heard (d) seen
(e) sounded
23. (a) assure (b) find
(c) judge (d) mark
(e) try
24. (a) drew (b) flung
(c) placed (d) cooked
(e) stitch
25. (a) top (b) head
(c) bottom (d) between
(e) middle
26. (a) morning (b) dinner
(c) room (d) fields
(e) dark
27. (a) vengeance (b) price
(c) cause (d) result
(e) time
28. (a) slept (b) felt
(c) located (d) carried
(e) found
29. (a) worried (b) rough
(c) irritable (d) sensitive
(e) pretty

30. (a) trust (b) assured
(c) wanted (d) think
(e) knew

Directions—(Q. 31–40) In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

When sound ... (31) ..., the world of cinema, mime made a gracious exit. ... (32) ... then, it stood proudly as a performing art in itself, independent and ... (33) ... in style, approach, treatment and performance not matched however, by ... (34) ... acceptance. During the silent era, actors in silent films had to ... (35) ... totally on mime as the only way of ... (36) ... their emotions, expressions, incidents, events and interactions between and among characters. German Expressionist cinema, the acting of classic performers like Charlie Chaplin, Harold Lloyd and Buster Keaton used mime they had ... (37) ... as part of their theatrical ... (38) ... in their films with great effect. A French mime artist once said, "Mime is the poetry of silence." But once talking ... (39) ... entered the scenario, mime was ... (40) ... ever used in films, even through a character introduced as a mime artist.

31. (a) entered (b) came
(c) saw (d) became
(e) featured
32. (a) From (b) So
(c) Since (d) By
(e) Until
33. (a) single (b) fair
(c) dependent (d) unique
(e) treacherous
34. (a) drama (b) conclusion
(c) opinion (d) judgement
(e) popular
35. (a) portray (b) act
(c) rely (d) depict
(e) earn
36. (a) mentioning (b) designing
(c) stimulating (d) expressing
(e) considering
37. (a) worked (b) learnt
(c) qualified (d) bought
(e) invested
38. (a) experience (b) showings
(c) vision (d) distance
(e) story
39. (a) toys (b) worlds
(c) films (d) people
(e) mimes
40. (a) and (b) hardly
(c) then (d) thus
(e) for

Directions (Q. 41–50) In the following passage, there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

There was once a poet who fell upon such hard times that he was no longer able to ... (41)... his family. Hearing that the king greatly encouraged talent and was famed for his generosity, the poet set off for the Royal Palace. When brought ... (42)... the king, he ... (43)... low and requested permission to recite a poem. On hearing his recitation, the king was well pleased and asked him to name his reward.

The poet, ... (44)... to a chessboard before the king, said, "your highness, if you place just one grain of rice on the first square of this chess-board, and double it for every square, I will consider myself well ... (45)..." "Are you sure?" asked the king, greatly ... (46)... "Just grains of rice, not gold" ? "Yes, your highness," affirmed the poet. "So it shall be" ordered the king. His courtiers started ... (47)... the grain on the chess-board. One grain on the first square, two on the second, four on the third, ... (48)... on the fourth and so no. By the time they reached the tenth square they had to place five hundred and twelve grains of rice. The number rose to lakhs on the twentieth square. When they ... (49)... the half way mark, the grain count was over hundred crores ! Soon the count ... (50)... to lakhs of crores and eventually the helpless king had to hand over his entire kingdom to the clever poet. And it all began with just one grain of rice.

41. (a) surrender (b) fight
(c) care (d) feed
(e) defend
42. (a) before (b) following
(c) after (d) by
(e) aside
43. (a) hunched (b) knelt
(c) fell (d) stand
(e) bowed
44. (a) talking (b) across
(c) pointing (d) eyeing
(e) looking
45. (a) deserved (b) rewarded
(c) blessed (d) fortunate
(e) equipped
46. (a) surprised (b) vigilant
(c) understanding (d) happy
(e) honoured
47. (a) sampling (b) hiding
(c) finding (d) placing
(e) moving
48. (a) seven (b) eight
(c) three (d) five
(e) six
49. (a) entered (b) reached
(c) revised (d) arrived
(e) interrupted
50. (a) justified (b) enlarged
(c) risen (d) improved
(e) increased

Directions (Q. 51–60) In the following passage, there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

Once upon a time there lived a peacock and a tortoise in close proximity and they became the best of friends. The peacock lived on a tree on the ... (51)... of a stream which was the home of the tortoise. It was a daily ... (52)... for the peacock to dance near the stream after he had a drink of water. He would display his great plumage for the amusement of his friend. One unfortunate day, a bird-catcher who was on the ... (53)... caught the peacock and was about to take him away to the market. The unhappy bird begged his captor to allow him to bid his friend the tortoise good-bye, as it would be the ... (54)... time he would see him. The bird-catcher gave in to his request and took him to the tortoise. The tortoise was in tears to see his friend held ... (55)....

The tortoise asked the birdcatcher to let the peacock go; but he laughed at the request, saying that it was his means of livelihood. The tortoise then said, "If I give you an expensive present, will you let my friend go?" "Certainly," answered the bird-catcher. Whereupon, the tortoise ... (56)... into the water and in a few seconds came up with a handsome pearl, which he presented to the bird-catcher. This was beyond the man's expectations, and he let the peacock go immediately. A short time after, the bird-catcher came back and told the tortoise that he thought he had not paid enough for the release of his friend, and ... (57)... that unless a match to the pearl was obtained for him, he would catch the peacock again. The tortoise, who had already ... (58)... his friend to shift to a distant jungle on being set free, was greatly ... (59)... by the greed of the bird - catcher. "Well," said the tortoise, "if you insist on having another pearl like the one I gave you, give it back to me and I will fish you an exact match for it." The greediness of the bird-catcher prevented his reasoning and he ... (60)... gave the pearl to the clever tortoise. The tortoise swam out with it saying, "I am no fool to give you another pearl, your greediness has left you with nothing.

51. (a) fence (b) brim
(c) banks (d) base
(e) outlet
52. (a) fact (b) lifestyle
(c) phenomenon (d) adventure
(e) routine
53. (a) prowl (b) guard
(c) rounds (d) duty
(e) alert
54. (a) right (b) last
(c) perfect (d) appropriate
(e) justified
55. (a) captive (b) custody
(c) affectionately (d) badly
(e) carelessly
56. (a) collapsed (b) dived
(c) sunk (d) drowned
(e) slipped

57. (a) wished (b) secured
(c) contemplated (d) debated
(e) threatened
58. (a) advised (b) left
(c) disowned (d) excluded
(e) wanted
59. (a) aware (b) enraged
(c) superstitious (d) touched
(e) tolerant
60. (a) deftly (b) clumsily
(c) selfishly (d) affectionately
(e) promptly

DIRECTIONS (Q. 61–70) In the following passage, there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

Haria, a poor barber lived alone in his small hut. He was ... (61)... to his work and whatever he earned was enough to fulfil his needs. One evening, after returning from work, Haria was hungry. Just as he was ... (62)... what he could cook for dinner he heard a hen clucking outside his hut. "That hen would make a great feast for me," thought Haria and prepared to catch the hen. With a little effort he ... (63)... in catching the hen and as he was about to kill the hen, it squeaked, "Please do not kill me, Oh kind man ! I will help you." Haria stopped. ... (64)... he was surprised that the hen spoke, he asked, "How can you help me ?" "If you ... (65)... my life, I will lay a golden egg for you everyday," said the hen.

Haria's eyes ... (66)... in delight. Haria was surprised to hear this promise. "A golden egg ! That too everyday ! But why should I believe you ? You might be lying," said Haria. "If I do not lay a golden egg tomorrow, you can kill me," said the hen. After this promise, Haria spared the hen and ... (67)... for the next day.

The next morning, Haria found a golden egg ... (68)... outside his hut and the hen sitting beside it. "It is true ! You really can lay a golden egg !" exclaimed Haria with great delight. He did not ... (69)... this incident to any one, ... (70)... that others would catch the hen.

61. (a) dedicated (b) devote
(c) enthusiastic (d) good
(e) engrossed
62. (a) feeling (b) sounding
(c) dreaming (d) plotting
(e) wondering
63. (a) quit (b) surrendered
(c) succeeded (d) won
(e) managed
64. (a) Finally (b) Though
(c) Since (d) As
(e) Because
65. (a) forgive (b) leave
(c) give (d) spare
(e) consume

66. (a) exclaimed (b) dazed
(c) open (d) awakened
(e) widened
67. (a) remembered (b) starved
(c) waited (d) rejoiced
(e) looked
68. (a) lying (b) forlorn
(c) presented (d) hiding
(e) secluded
69. (a) seek (b) say
(c) narrates (d) reveal
(e) hide
70. (a) fearing (b) selfish
(c) concerning (d) citing
(e) alarmed

DIRECTIONS (Q. 71–75) In the following passage, there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

Daydreaming is often overlooked as a proper dream and ... (71)... instead as wandering thoughts. However, the meanings to your nightly dream, symbols are also ... (72)... to your day dreams. The content in your day dreams are helpful in understanding your true feelings and will help you in ... (73)... your goals. Daydreaming is the spontaneous imagining or recalling of various images or experiences in the past or the future. When you daydream, you are accessing your right brain, which is the creative and feminine side of your personality. Worrying about something creates visual images in your brain of the worst outcome that you are imagining and is a form of daydreaming. By repeating these negative images in your mind, you are more likely to make them happen. So the next time you start worrying, try to think of a positive outcome. Positive daydreaming is very healthy and acts as a temporary ... (74)... from the demands of reality. It is also a good way to ... (75)... built up frustrations without physically acting them out.

71. (a) composed (b) determined
(c) thought (d) felt
(e) regarded
72. (a) duplicated (b) present
(c) established (d) applicable
(e) depictive
73. (a) thinking (b) holding
(c) achieving (d) realise
(e) capturing
74. (a) solitude (b) healing
(c) gateway (d) passage
(e) escape
75. (a) adjust (b) confirm
(c) capture (d) release
(e) demonstrate

DIRECTIONS (Qs. 76-83) : In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

The Government seems to be in right earnest to ensure more ...(76)... in governance. The Prime Minister's announcement that his Government is ...(77)... drafting legislation to establish the citizen's right to information is indeed welcome. Though the talk on the right to information is not new, we may ...(78)... the bill to be brought early this time. The previous Government had set up a high-level committee to prepare a draft bill. But nothing has been heard about the matter since, ...(79)... the committee did quite some work. The issue, however, has come to such a pass that a solution cannot be ...(80)... further. Sunlight is the best disinfectant, a foreign judge once said, while ...(81)... the unwarranted secrecy in an administrative system. When those in authority know that people have the right to ask questions and the government is under the ...(82)... to provide them with answers, ...(83)... of authority, or of public finances, for personal or party ends is less likely to happen.

76. (a) strictness (b) rudeness
(c) leniency (d) economy
(e) transparency
77. (a) personally (b) busy
(c) not (d) reluctantly
(e) absolutely
78. (a) expect (b) wait
(c) try (d) frustrate
(e) appeal
79. (a) even (b) as
(c) because (d) until
(e) though
80. (a) found (b) expected
(c) delayed (d) looked
(e) longed
81. (a) nurturing (b) criticising
(c) demanding (d) appreciating
(e) upholding
82. (a) pretention (b) affect
(c) substance (d) obligation
(e) property

83. (a) misuse (b) governance
(c) dishonour (d) curbing
(e) breach

DIRECTIONS (Qs. 84-91): In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

Trust is the basis of human relationship. As trust between people grows, ...(84)... change and interpersonal dynamics are transformed. Diverse skills and abilities become ...(85)... and appreciated as strengths. People begin to ...(86)... one another's attitudes and feelings. They learn to be ...(87)... instead of playing roles. As trust grows the barriers that prevent ...(88)... and openness lessen. People become more expressive, impulsive, frank and spontaneous. Their communication is efficient and clear. They risk ...(89)... and confrontation, opening the doors to deeper communication, involvement and commitment. Congestion and ...(90)... lessen. The flow of data is open and ...(91)...

84. (a) motivations (b) behaviours
(c) patterns (d) aspirations
(e) commitments
85. (a) obvious (b) necessary
(c) essential (d) recognised
(e) prominent
86. (a) accept (b) participate
(c) pronounce (d) inculcate
(e) relate
87. (a) advocates (b) possessed
(c) exponents (d) indifferent
(e) themselves
88. (a) snobbery (b) egoism
(c) brashness (d) boasting
(e) candour
89. (a) conflict (b) persuasiveness
(c) dedication (d) propensity
(e) jealousy
90. (a) pervasiveness (b) boundaries
(c) sluggishness (d) blocking
(e) enthusiasm
91. (a) unanimous (b) uncritical
(c) uninhabited (d) uncanny
(e) unusual

ANSWER KEY

1	(a)	13	(d)	25	(a)	37	(b)	49	(b)	61	(a)	73	(c)	85	(e)
2	(c)	14	(e)	26	(a)	38	(a)	50	(e)	62	(e)	74	(e)	86	(a)
3	(d)	15	(c)	27	(d)	39	(c)	51	(c)	63	(c)	75	(e)	87	(e)
4	(b)	16	(d)	28	(b)	40	(b)	52	(e)	64	(d)	76	(e)	88	(e)
5	(e)	17	(b)	29	(d)	41	(d)	53	(a)	65	(d)	77	(b)	89	(a)
6	(e)	18	(a)	30	(e)	42	(a)	54	(b)	66	(e)	78	(a)	90	(d)
7	(a)	19	(c)	31	(a)	43	(e)	55	(a)	67	(c)	79	(e)	91	(b)
8	(d)	20	(b)	32	(c)	44	(c)	56	(b)	68	(a)	80	(c)		
9	(b)	21	(e)	33	(d)	45	(b)	57	(e)	69	(d)	81	(b)		
10	(e)	22	(c)	34	(e)	46	(a)	58	(a)	70	(a)	82	(d)		
11	(a)	23	(b)	35	(c)	47	(d)	59	(b)	71	(e)	83	(a)		
12	(c)	24	(c)	36	(d)	48	(b)	60	(e)	72	(d)	84	(b)		

ANSWERS & EXPLANATIONS

45. (b) In the preceding paragraph the king had asked the poet to name his 'reward', hence the best option should be 'I will consider myself well rewarded.
50. (e) In this sentence, if you narrow down your options, you are left with only two choices i.e. (c) risen and (e) increased. Now that 'risen' is the past participle while we need here the past form, so 'increased' fits in.
52. (e) Here it should be 'routine'-In the sentence. 'It was a daily routine'. Another example : The players had to change their daily routine.
53. (a) The idiom 'on the prowl' means 'actively looking for something'. Example : IT-professionals are on the prowl for better jobs these days.

MIS-SPELT WORDS

Correct Spellings of Words

English is a fantastic language that many of us have a great desire to learn and to speak. But many of us find it hard to speak English correctly because of pronunciation of the words. Many words in English are pronounced alike with different spelling. This mispronunciation of words makes it hard to identify the words when someone speaks. This also makes us misspell the words.

In English some sounds like "t" at the end of a word are silent. This makes the chance of misspelling the word more. For example, let us consider the word "start", many of us do not pronounce the "t" sound, which is at the end of the word. This makes the listener hard to identify the spoken word. He might understand the word as "star" which is also a valid word. This affects the meaning of the sentence.

Let us see another example "read". We can use this word in past tense, present tense as well as future tense. While we use this word in past tense we pronounce it as "red" and when we use the same word in present or future tense we pronounce it as "read". Hence, based on the sentence we have to pronounce the word.

Let us consider the words "bear" and "bare", both are pronounced alike, but both have different meanings. We must use the right word according to the sentence based on the meaning of the sentence. Hence, we have to spell the words correctly according to the meaning of the sentence.

The most effective way of learning spelling of words is personal word power list. First, find out the reason why you are misspelling the words. Note them, correct them and keep them in mind. Suppose when you come across misspelling of a word then follow these steps.

- ❖ Note the misspelled word.
 - ❖ Write the correct spelling of the misspelled word.
 - ❖ Make a note of why you have misspelled the word.
 - ❖ Note the meaning of the word. (make a description of the word)
 - ❖ Write a new sentence using the word.
- And you can overcome misspelling the words, so that you can spell the words correctly which are alike.

How to spell words Correctly

Rule 1: "I before E except after C";

This rule, designed to help us remember how to spell words such as receive and chief, seems so promising in its simplicity at first.

- ❖ achieve, believe, bier, brief, hygiene, grief, thief, friend, grieve, chief, fiend, patience, pierce, priest
- ❖ ceiling, conceive, deceive, perceive, receipt, receive, deceit, conceit

But then things get complicated: it doesn't work with words pronounced "ay" as in neighbor, freight, beige, sleigh, weight, vein, and weigh and there are many exceptions to the rule: either, neither, feint, foreign, forfeit, height, leisure, weird, seize, and seizure.

Still, the rule is relatively simple and worth remembering.

Rule 2: "Dropping Final E"

When adding an ending to a word that ends with a silent e, drop the final e if the ending begins with a vowel:

- ❖ advancing
- ❖ surprising
- ❖ advancement
- ❖ likeness

However, if the ending begins with a consonant, keep the final e:

- ❖ advancement
- ❖ likeness

(However, if the silent e is preceded by another vowel, drop the e when adding any ending: argument, argued, truly.)

Exceptions: To avoid confusion and mispronunciation, the final e is kept in words such as mileage and words where the final e is preceded by a soft g or c: changeable, courageous, manageable, management, noticeable. (The word management, for example, without that e after the g, would be pronounced with a hard g sound.)

Rule 3: "Dropping Final Y"

When adding an ending to a word that ends with y, change the y to i when it is preceded by a consonant.

- ❖ supply becomes supplies
- ❖ worry becomes worried
- ❖ merry becomes merrier

This does not apply to the ending -ing, however.

- ❖ crying
- ❖ studying
- ❖ Nor does it apply when the final y is preceded by a vowel.
- ❖ obeyed
- ❖ saying

Rule 4: "Doubling Final Consonants"

When adding an ending to a word that ends in a consonant, we double that consonant in many situations. First, we have to determine the number of syllables in the word.

Double the final consonant before adding an ending that begins with a vowel when the last syllable of the word is accented and that syllable ends in a single vowel followed by a single consonant.

- ❖ submit is accented on the last syllable and the final consonant is preceded by a vowel, so we double the t before adding, for instance, an -ing or -ed: submitting, submitted.
- ❖ flap contains only one syllable which means that it is always accented. Again, the last consonant is preceded by a vowel, so we double it before adding, for instance, an -ing or -ed: flapping, flapped. This rule does not apply to verbs that end with "x," "w," "v," and "y," consonants that cannot be doubled (such as "box" [boxing] and "snow" [snowing]).
- ❖ open contains two syllables and the last syllable is preceded by a single vowel, but the accent falls on the first syllable, not the last syllable, so we don't double the n before adding an ending: opening, opened.
- ❖ refer contains two syllables and the accent falls on the last syllable and a single vowel precedes the final consonant, so we will double the r before adding an ending, as in referring, referral. The same would apply to begin, as in beginner, beginning.
- ❖ relent contains two syllables, but the final consonant is preceded by another consonant, not a vowel, so we do not double the t before adding an ending: relented, relenting.
- ❖ deal looks like flap (above), but the syllable ends in a consonant preceded not by a single vowel, but by two vowels, so we do not double the final l as in dealer and dealing. The same would apply, then, to despair: despairing, despaired.

Rule 5: "Adding Prefixes"

Generally, adding a prefix to a word does not change its spelling. For some reason, the word misspelling is one of the most often misspelled words in English. See the material on adding prefixes in the section on Vocabulary. See, also, the section on the creation and spelling of Compound Nouns and Modifiers.

- ❖ unnecessary, dissatisfied, disinterested, misinform

Tips to spell words Correctly

- ❖ Take the letters in the word and write a sentence with each of them. For example, you could learn to spell "arithmetic" with the sentence "A rat in the house might eat the ice cream."
- ❖ Proofread your work. We all get busy at some point during writing, which makes it easy to toss in a sound alike word such as reef or wreath; and you can carry on that mistake unaware that a mistake has been made...until later and it jumps out at you...then you are like, "Wow, I wrote that?"
- ❖ Check compound words in a dictionary. There is really no way to know whether to write "stomachache," "stomach-ache," or "stomach ache" unless you consult a dictionary.

- ❖ Reading books and newspapers, catalogues, billboard signs, posters in windows all aid in learning how to spell. If you find a word that is not familiar, write it down, even if all you have is a paper napkin. When you go home, look up the word or words in the dictionary. The more you reference, the more you read, the better you will be at spelling.
- ❖ It can really help to be familiar with the spelling of a few other languages, and to know the language that the word comes from.
- ❖ Don't be afraid to use the dictionary. English words come from many different languages. A good dictionary can tell you where the word is from, and when you begin to learn them you will begin to recognize patterns.

Most Often Misspelled Words in English

- ❖ absence - absense, absance
- ❖ acceptable - acceptible
- ❖ accidentally/accidently - accidental
- ❖ accommodate - accomodate, accomodate
- ❖ achieve - acheive
- ❖ acknowledge - acknowlege, alnowledge
- ❖ acquaintance - acquaintence, aquaintance
- ❖ acquire - aquire, adquire
- ❖ acquit - aquit
- ❖ acreage - acrage, acerage
- ❖ address - adress
- ❖ adultery - adulatory
- ❖ advisable - adviseable, advizable
- ❖ affect - effect
- ❖ aggression - agression, aggesion
- ❖ alcohol - alchohol
- ❖ allege - alege, allage
- ❖ allegiance - allegaince, allegience, alegiance
- ❖ almost - allmost
- ❖ a lot - alot (must be two words)
- ❖ amateur - amatuer, amature
- ❖ amend - ammend
- ❖ annually - anually, annually
- ❖ apparent - apparant, aparent
- ❖ arctic - artic
- ❖ argument - arguement
- ❖ atheist - athiest
- ❖ athlete - athelete
- ❖ average - avrage, averge
- ❖ awful - awfull, awful
- ❖ balance - ballance, balence
- ❖ basically - basicly
- ❖ because - becuase
- ❖ becoming - becomeing
- ❖ before - befor
- ❖ beginning - begining
- ❖ believe - beleive
- ❖ bellwether - bellweather
- ❖ benefit - benifit
- ❖ buoy/buoyant - bouy/bouyant
- ❖ breathe - breath, brethe
- ❖ brilliant - briliant
- ❖ burglar - burgler
- ❖ business - bisness, bussiness, bizness, buisness
- ❖ calendar - calender

- ❖ camouflage - camoflage, camoflague
- ❖ capitol - capital (both words exist, but are distinct)
- ❖ career - carrer
- ❖ careful - carefull
- ❖ Caribbean - Carribean
- ❖ category - catagory
- ❖ caught - cauht, caugt
- ❖ ceiling - cieling
- ❖ cemetery - cemetary, cematerly
- ❖ certain - certin
- ❖ changeable - changable
- ❖ chief - cheif
- ❖ citizen - citezen
- ❖ colleague - collaegue, colleague
- ❖ collectible - collectable
- ❖ column - colum
- ❖ comfortable - confortable
- ❖ coming - comming
- ❖ committed - committed, comitted
- ❖ competition - compitition
- ❖ concede - conceed
- ❖ conceive - concieve
- ❖ congratulate - congradulate
- ❖ conscientious - consciencious
- ❖ conscious - concious, consious
- ❖ consensus - concensus
- ❖ controversy - contraversy
- ❖ convenience - conveniance
- ❖ coolly - cooly
- ❖ criticize - critecize, criticize
- ❖ daiquiri - dacquiri, daquiri
- ❖ deceive - decieve
- ❖ decide - dicide
- ❖ definite - definate, definit
- ❖ definitely - defintly, definately, defiantly
- ❖ deposit - deposite
- ❖ describe - discribe
- ❖ desperate - desparate
- ❖ develop - developpe
- ❖ difference - diffrence
- ❖ dilemma - dilema
- ❖ disappear - disapear, dissapear
- ❖ disappoint - disapoint
- ❖ disastrous - disasterous
- ❖ discipline - disipline
- ❖ doable - dooable
- ❖ does - deos, dose
- ❖ drunkenness - drunkeness
- ❖ dumbbell - dumbell
- ❖ during - durring
- ❖ easily - easely
- ❖ eighth - eighth
- ❖ either - iehter, ether
- ❖ embarrass - embarass
- ❖ environment - enviroment
- ❖ equipped - equiped
- ❖ equipment - equiptment
- ❖ exaggerate - exagerate
- ❖ exceed - excede
- ❖ excellent - exellent, excelent
- ❖ except - exsept
- ❖ exercise - exercize, exercize
- ❖ exhausted - exausted
- ❖ exhilarate - exilerate
- ❖ existence - existance
- ❖ expect - exspect
- ❖ experience - experiance
- ❖ experiment - experament
- ❖ explanation - explanation
- ❖ extreme - extream
- ❖ familiar - familier
- ❖ fascinating - facinating, fasinating
- ❖ fiery - firey
- ❖ finally - finaly
- ❖ fluorescent - flourescent
- ❖ fluoride - flouride
- ❖ foreign - foriegn
- ❖ forty - fourty
- ❖ forward - foreward
- ❖ friend - freind
- ❖ fulfil - fullfil (American: fulfill)
- ❖ fundamental - fundemental
- ❖ gauge - guage
- ❖ generally - generaly, genrally
- ❖ government - goverment
- ❖ grammar - grammer
- ❖ grateful - gratefull, grateful
- ❖ guarantee - garantee, garentee, garanty
- ❖ guidance - guidence
- ❖ happiness - happyness
- ❖ harass - harrass
- ❖ height - heighth, heigth
- ❖ heroes - heros
- ❖ hierarchy - heirarchy
- ❖ hors d'oeuvres - hors derves, ordeurves
- ❖ humorous - humerous
- ❖ hygiene - hygene, hygine, higeine, hygeine
- ❖ hypocrisy/hypocrite - hipocrit
- ❖ identity - idenity, identidy
- ❖ ignorance - ignorence
- ❖ imaginary - imaginery
- ❖ imitate - immitate
- ❖ imitation - immitation, imitashun
- ❖ immediately - imediately
- ❖ incidentally - incidently
- ❖ independent - independant
- ❖ indispensable - indispsensible
- ❖ inoculate - innoculate
- ❖ intelligence - inteligence, intelligance
- ❖ interesting - intresting
- ❖ interruption - interuption
- ❖ irrelevant - irrelevant
- ❖ irritable - irritible
- ❖ island - iland
- ❖ jealous - jellous
- ❖ jewelry (UK: jewellery) - jewelery
- ❖ judgment - judgement (issue in the U.S.)
- ❖ kernel - kernal, distinct from homophone colonel
- ❖ kindergarten - kindergarden
- ❖ knowledge - knowlege

- ❖ leisure - liesure
- ❖ liaison - liason
- ❖ library - libary, liberry
- ❖ license - lisence (US always license, UK noun licence)
- ❖ lightning - lightening
- ❖ loneliness - lonelyness
- ❖ lose - loose (both words exist, but are distinct)
- ❖ losing - loosing, loseing
- ❖ lying - lieing
- ❖ maintenance - maintenence, maintnance
- ❖ maneuver - manuever, manuver (UK: manoeuvre)
- ❖ marriage - marrige
- ❖ masturbation-masterbation
- ❖ mathematics - mathmatics
- ❖ medicine - medcine[citation needed]
- ❖ medieval - medeval, medevil, mideval
- ❖ memento - momento
- ❖ millennium - millenium, millennium
- ❖ miniature - miniture
- ❖ minuscule - miniscule
- ❖ minute - minite
- ❖ mischievous - mischevous, mischevious
- ❖ misspell - misspell, misspel
- ❖ mysterious - misterius,[citation needed] misterious
- ❖ naturally - naturaly
- ❖ necessary - neccessary, nessery
- ❖ niece - neice
- ❖ neighbor - nieghbor
- ❖ neither - niether
- ❖ noticeable - noticable
- ❖ occasion - occassion
- ❖ occasionally - occasionaly, occassionally
- ❖ occurrence - occurance, occurence
- ❖ occurred - occured
- ❖ official - ofical
- ❖ often - offen
- ❖ omission - ommision, omision
- ❖ operate - oprate
- ❖ opportunity - oppurtunity
- ❖ optimism - optimisim
- ❖ original - orignal
- ❖ outrageous - outragous
- ❖ paid - payed
- ❖ parallel - parrallel, parellel
- ❖ parliament - parliment
- ❖ particularly - particulry
- ❖ pastime - passtime, pasttime
- ❖ peculiar - peculiar
- ❖ perceive - percieve
- ❖ perform - preform
- ❖ permanent - pernament
- ❖ perseverance - perseverance
- ❖ personally - personaly
- ❖ personnel - personell, personel
- ❖ persuade - persaude
- ❖ picture - pichure, pitcher
- ❖ piece - peice
- ❖ planning - planing
- ❖ plagiarize - plagerize
- ❖ playwright - playright, playwrite
- ❖ pleasant - plesant
- ❖ political - pollitical
- ❖ possession - -posession, possesion
- ❖ potatoes - potatos
- ❖ practical - practicle
- ❖ precede - preceed
- ❖ prejudice - predjudice
- ❖ presence - presance
- ❖ primitive - primative
- ❖ principle - principal (both words exist, but are distinct)
- ❖ privilege - privelege, priviledge
- ❖ probably - probly
- ❖ professional - proffessional
- ❖ professor - professer
- ❖ promise - promiss
- ❖ pronunciation - pronounciation
- ❖ proof - prufe
- ❖ prophecy (as noun) - prophesy (valid as verb)
- ❖ psychology - psycology
- ❖ publicly - publically
- ❖ quantity - quanity
- ❖ quarantine - quarentine
- ❖ queue - que (from Bar-B-Que)
- ❖ questionnaire - questionnaire, questionnair
- ❖ quite - distinct from quiet
- ❖ readable - readable
- ❖ realize - relize, reelize
- ❖ really - realy
- ❖ receive - recieve
- ❖ receipt - reciept
- ❖ recognize - reconize, reckonize
- ❖ recommend - recomend, reccommend
- ❖ referred - refered
- ❖ reference - referance, refrence
- ❖ relevant - relevent, revelant
- ❖ religious - religous, religius
- ❖ repetition - repitition
- ❖ restaurant - restarant, restaraunt
- ❖ rhyme - rime, ryme
- ❖ rhythm - rythm, rythem
- ❖ ridiculous - rediculous, ridicolous
- ❖ sacrifice - sacrefice
- ❖ safety - saftey, safty
- ❖ scissors - sissors
- ❖ secretary - secratary, secretery
- ❖ seize - sieze
- ❖ separate - seperate
- ❖ sergeant - sargent
- ❖ shining - shineing
- ❖ similar - similer, simmilar, simular
- ❖ sincerely - sinceerly
- ❖ skilful - skilfull (American: skillful)
- ❖ soldier - solider
- ❖ speech - speach, speeche (archaic)
- ❖ stopping - stoping
- ❖ strength - strenght
- ❖ succeed - succede

- ❖ successful - sucesful, successfull, successful
- ❖ supersede - supercede
- ❖ surely - surelly
- ❖ surprise - suprise, surprize
- ❖ their - they're (both words exist, but are distinct)
- ❖ tomatoes - tomatos
- ❖ tomorrow - tommorrow
- ❖ twelfth - twelth
- ❖ tyranny - tyranly
- ❖ underrate - underate
- ❖ until - untill
- ❖ upholstery - upholstry
- ❖ usable/useable - usable
- ❖ using - useing
- ❖ usually - usualy
- ❖ vacuum - vaccuum, vacume
- ❖ vegetarian - vegatarian
- ❖ vehicle - vehical
- ❖ vicious - visious
- ❖ weather - wether
- ❖ weird - wierd
- ❖ welfare - wellfare, welfair
- ❖ whether - wether
- ❖ wilful - wilfull (American: willful)
- ❖ withhold - withold
- ❖ writing - writting, writeing

EXERCISE

DIRECTIONS (Qs. 1-5) : In the following questions, five words are given out of which only one is mis-spelt. Find that mis-spelt word.

1. (a) combination (b) exageration
(c) hallucination (d) admonition
(e) clinical
2. (a) sacrosanct (b) sacrelege
(c) sacred (d) sacrament
(e) segment
3. (a) allitration (b) allowance
(c) almighty (d) almanac
(e) illicit
4. (a) idiosyncrasy (b) idealise
(c) idiosy (d) ideology
(e) ieonoclass
5. (a) jaundise (b) jasmine
(c) jvelin (d) jarving
(e) judgement

DIRECTIONS (Q. 6 to 10) In each question below, a sentence with four words printed in bold type is given. These are lettered as (a), (b), (c) and (d). One of these four words printed in bold may be either wrongly spelt or inappropriate in the context of the sentence. Find out the word which is wrongly spelt or inappropriate, if any. The letter of that word is your answer. If all the words printed in bold are correctly spelt and also appropriate in the context of the sentence, mark (e) i.e. 'All correct' as your answer.

6. People went **crazy** (a) when the **musician** along with his friend, (b) took to the **staging** (c) and **belted** out popular tracks (d). All correct (e)
7. For a growing number of **coupals**, (a) adoption is not a helpless **compulsion** (b) but a **deliberate**, (c) and often **noble**, choice. (d) All correct (e)

8. On two **consecutive** (a) nights the two **greatest icons** (b) of show-business were **honoured** with unprecedented (c) **affection**. (d) All correct (e)
9. We are so busy looking at **mediocrity** (a) that when a truly **outstanding** achievement (b) stares us in the face we **resort** (c) to the same terms of **praise**. (d) All correct (e)
10. The unlikely **migration** (a) was officially (b) explained as a move to meet **expanding** (c) business **opportunities**. (d) All correct (e)

DIRECTIONS (Q. 11–15) In each question below, four words printed in bold type are given. These are lettered (a), (b), (c) and (d). One of these words printed in bold may either be wrongly spelt or inappropriate in the context of the sentence. Find out the word that is inappropriate or wrongly spelt, if any. The letter of that word is your answer. If all the words printed in bold are correctly spelt and appropriate in the context of the sentence then mark (e) i.e. 'All correct' as your answer.

11. The **Principle** (a) **insisted** that the teachers (b) set an **example** (c) for the **students**. (d) All correct (e)
12. All **drivers** (a) **must** carry (b) their **lisense** (c) and insurance **papers** (d) All correct (e)
13. **Children** (a) **normally** respond (b) to **praise** (c) and **encoragement**. (d) All correct (e)
14. **Modern** (a) farm **implements** (b) have **revolusionised** (c) the **agricultural industry**. (d) All correct (e)
15. The **mountain** (a) **range** (b) has many high **peaks** (c) and deep **canyones**. (d) All correct (e)

DIRECTIONS (Q. 16–20) In each question below four words which are lettered (A), (B), (C) and (D) have been printed, of which, one word may be wrongly spelt. The letter of that word is the answer. If all the four words are correctly spelt, mark (E) i.e. "All Correct" as the answer.

16. (a) Accept (b) Reciept
(c) Frequent (d) Gesture
(e) All Correct

17. (a) Justise (b) Practice
(c) Menace (d) Variance
(e) All Correct
18. (a) Complaint (b) Alerted
(c) Cheated (d) Hunged
(e) All Correct
19. (a) Remorse (b) Noble
(c) Upsurge (d) Incline
(e) All Correct
20. (a) Blister (b) Warrant
(c) Arrest (d) Mannual
(e) All Correct

DIRECTIONS (Q. 21–25) In each question below, four words printed in bold type are given. These are lettered (A), (B), (C) and (D). One of these words printed in bold may either be wrongly spelt or inappropriate in the context of the sentence. Find out the word that is inappropriate or wrongly spelt, if any. The letter of that word is your answer. If all the words printed in bold are correctly spelt and appropriate in the context of the sentence then mark (E) i.e. 'All correct' as your answer.

21. All the **competitors** (a) **completed** (b) the **race**, (c) with just one **exemption**. (d) All correct (e)
22. Poor **posture** (a) can **lead** (b) to **muscular** (c) **problems** (d) in **later** life. All correct (e)
23. The **pump** (a) shut **off** (b) as a **result** (c) of a **mechanical** failure (d). All correct (e)
24. The **Principal** (a) gave a very **pompous** (b) **speech** (c) about. 'The **portals** of learning' (d). All correct (e)
25. **Copeing** (a) with her **mother's** long illness (b) was a heavy **load** (c) to **bear**. (d) All correct (e)

DIRECTIONS (Qs. 26–30) : In each question below a sentence with four words printed in bold type is given. These are numbered as (a), (b), (c), or (d). One of these four boldly printed words may be either *wrongly spelt* or *inappropriate* in the context of the sentence. Find out the word which is wrongly spelt or inappropriate, if any. The letter of that word is your answer. If all the boldly printed words are correctly spelt and also appropriate in the context of the sentence, mark (e), i.e. 'All correct', as your answer.

26. It is indeed **recommendable** (a) that the apex court has **deemed** (b) it necessary to remind the government of its duties in **promoting** (c) education and **investing** in it (d). **All correct** (e)

27. The **perception** (a) of animal life was even more **ambiguous** (b) because of **anthropomorphic** (c) **characterisations** of animal behaviour (d). **All correct** (e).
28. Policy of **permitting** (a) **legal** (b) import of gold has **stimulated** (c) its **consumation** (d). **All correct** (e)
29. His **continually** (a) **defending** (b) his stand on the issue has **risen** (c) **doubts** in the mind of the jury (d). **All correct** (e).
30. The government's strategy to **encourage** (a) **entrepreneurship** (b) **gathers momentum** (c) with **unenviaged** response (d). **All correct** (e)

DIRECTIONS (Qs. 31–35) : In each question below four words numbered (a), (b), (c) and (d) have been printed, one of which may be either inappropriate in the context or *wrongly spelt*. The letter of that word is the answer. If all the four words are correctly spelt and are appropriate in the context, mark (e), i.e. 'All correct', as the answer.

31. Kindly **note** (a) our **address** (b) and use it in (c) all the **farther** communication (d). All correct (e)
32. We are **already** (a) to **fight** (b) the **battle** (c) let the enemy come (d). All correct (e)
33. Many people in India **cherish** (a) a desire to **immigrate** (b) to **developed** (c) countries to **make** a fortune (d). All correct (e)
34. He took great **pains** (a) to **save** (b) many **dyeing** (c) folk arts and helped the artists to live an **honourable** life (d). All correct (e).
35. Arun did his MBA from a **prestigious** (a) **institute** (b) by **securing** (c) first class in this **calendar** year (d). All correct (e).

DIRECTIONS (Qs. 36–40) : In each sentence below, four words have been printed in bold and lettered as (a), (b), (c) and (d). One of them may be *wrongly spelt* or *inappropriate* in the context of the sentence or grammatically incorrect. The letter of that word is the answer. If there is no error of any of the above types, the answer is (e), i.e., 'No Error'.

36. Imported items are **costlier** (a) than **there** (b) **domestic** (c) **Counterparts** (d). No error (e)
37. **Although** (a) I was paid **significant1y** (b) low, I found my salary to be **insufficient** (c) or rather **adequate** (d). No error (e)
38. An **exhorbitantly** (a) rigid attitude may **prove** (b) very **dangerous** (c), even **fatal** (d) No error (e).
39. There is hardly any **resemblance** (a) between the **faces** of (b) the so-called **identical** (c) **twins** (d). No error (e)
40. India has **progressed** (a) **remarkably** in (b) **exercising** (c) our commitments in international **affairs** (d). No error (e).

ANSWER KEY

1	(b)	6	(c)	11	(a)	16	(b)	21	(d)	26	(a)	31	(d)	36	(b)
2	(b)	7	(a)	12	(c)	17	(a)	22	(e)	27	(d)	32	(a)	37	(c)
3	(a)	8	(b)	13	(d)	18	(d)	23	(d)	28	(d)	33	(b)	38	(a)
4	(c)	9	(e)	14	(c)	19	(e)	24	(c)	29	(c)	34	(c)	39	(a)
5	(a)	10	(e)	15	(e)	20	(d)	25	(a)	30	(d)	35	(b)	40	(e)

ANSWERS & EXPLANATIONS

1. (b) exaggeration-The correct word is exaggeration
2. (b) sacrelege-The correct word is sacrilege
3. (a) allitration-The correct word is alitration
4. (c) idiosy-The correct word is idiocy
5. (a) Jaundise-The correct word is Jaundice
26. (a) Here it should be 'It is indeed commendable' instead of 'recommendable' 'commendable' means 'worthy of praise'.
27. (d) It should be 'characteristics of animal behaviour' instead of 'characterisations of animal behaviour'.
29. (c) It should be 'raised' in place of 'risen'
30. (d) In this sentence, it has to be 'with envisaged response' which means with a picture in mind while 'with unenvisaged' is the opposite.
31. (d) It should be further in place of farther.
32. (a) It should be all ready in place of already.
33. (b) Replace immigrate by emigrate.
34. (c) It should be dying in place of dyeing.
36. (b) their
37. (c) sufficient
38. (a) exorbitantly
39. (a) resemblance
40. (e) All correct

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PARAJUMBLES

CHAPTER

5

Sentence or Word Rearrangement

In this type of question, basically, you are given a paragraph or sentence - but the sentences (in case of paragraph) or words (in case of sentence) are not in the right order. It's up to you to untie this knot and rearrange the sentences or words so that they logically make sense.

Sentences or words rearrangement questions are included in BANK exams as they

- ❖ Help students relate events in a logical manner
- ❖ Sequence sentences based on English usage skills

How to tackle these types of questions?

To tackle these type of questions, you have to know three things.

- ❖ Theme of the paragraph that might be created on un-jumbling the sentences.
- ❖ Initiating sentence, which starts the paragraph
- ❖ Links have to be found between two sentences. Once a link of this type is created, it becomes easy to eliminate irrelevant choices.

How to save time while solving these types?

It is very important to read selectively and search for transition words or other keywords.

The best way is to establish a link between any two (or more) statements. Once a link is found, you get to know which statements will come together. Then, look in the options. Select the option with those statements together.

Example 1 :

- A. 1971 war changed the political geography of the subcontinent
B. Despite the significance of the event there has been no serious book about the conflict
C. Surrender at Dacca aims to fill this gap
D. It also profoundly altered the geo-strategic situation in South-East Asia
- (a) ACBD (b) CADB
(c) BADC (d) ADBC

Explanation : We can see that Sentence A is most likely the starting sentence. Now that we know that A is the starting sentence we can eliminate choice (b) and (c) as they start with C and B respectively.

This narrows down our possibilities to option (a) and option (d)

Now we can see in option (a), C follows sentence A but the gap spoken of in sentence C has no correlation with political geography of the subcontinent spoken of in sentence A, so we can rule out Option (a).

Therefore answer has to be option (d), as we can also see it elaborates on the change mentioned in sentence A.

Example 2 :

- A. Thus begins the search for relief: painkillers, ice, yoga, herbs, even surgery
B. Most computer users develop disorders because they ignore warnings like tingling fingers, a numb hand or a sore shoulder
C. They keep pointing and dragging until tendons chafe and scar tissue forms, along with bad habits that are almost impossible to change
D. But cures are elusive, because repetitive street injuries present a bag of ills that often defy easy diagnosis.
- (a) BDAC (b) BADC
(c) BCAD (d) ABCD

Explanation : Here we can make out that sentence B will be the starting sentence as it introduces the subject matter which is 'computer users and related problems'.

Option (d) automatically gets eliminated as it starts with sentence A.

Option (a) can be rule out as there is no correlation between sentence B and sentence D. Sentence B talks of warnings whereas sentence D talks of cures for illness and hence no correlation exists.

Example 3 :

- A. If you are used to having your stimulation come in from outside, your mind never develops its own habits of thinking and reflecting
- B. Marx thought that religion was the opiate, because it soothed people's pain and suffering and prevented them from rising in rebellion
- C. Karl Marx was alive today, he would say that television is the opiate of the people.
- D. Television and similar entertainments are even more of an opiate because of their addictive tendencies.
- (a) BACD (b) ADBC
(c) BDCA (d) CBDA

Explanation:

Sentence B has Marx (short Form) and sentence C has Karl Marx (Full form). So C will come before B. Now in given options we can clearly see (a) and (b) and (c) , B is placed before C and hence we reject option (a), (b) and (c) which leaves us with only option (d) which is the correct option.

Example 4 :

- A. Then two astronomers-the German, Johannes Kepler, and the Italian, Galileo Galilei-started publicly to support the Copernican theory, despite the fact that the orbits it predicted did not quite match the ones observed.
- B. His idea was that the sun was stationary at the centre and that the earth and the planets move in circular orbits around the sun.
- C. A simple model was proposed in 1514 by a Polish priest, Nicholas Copernicus.
- D. Nearly a century passed before this idea was taken seriously.
- (a) CDBA (b) CBDA
(c) BCAD (d) CADB

Explanation: Answer is option (b) as we can see that in sentence D it says 'nearly a century has passed' so we have to keep the timeline in consideration here also while sequencing the sentences and only in option 2 the timeline fits correctly.

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EXERCISE

DIRECTIONS (Qs.1-5) : Rearrange the following six sentences I, II, III, IV, V and VI in proper sequence so as to form a meaningful paragraph. Then answer the questions given below them.

- I. We were interested by contrast in understanding what lessons actual teams and non-teams had for others to choose to struggle with change and performance.
- II. Still, we suspected that most of these focused on persuading readers that terms are important.
- III. After all we thought teams are a well-known subject and there must be a thousand books on the subject already.
- IV. By going down this path we hope to discover something to say that was different from most books on the subject.
- V. We approached the idea of a book on teams cautiously.
- VI. Alternatively they focused on providing you to advise on building teams as an objective in itself.

1. Which of the following will be the SECOND sentence?

- | | |
|--------|---------|
| (a) I | (b) II |
| (c) VI | (d) III |
| (e) IV | |

2. Which of the following will be the FIRST sentence?

- | | |
|--------|---------|
| (a) V | (b) I |
| (c) II | (d) III |
| (e) IV | |

3. Which of the following will be the THIRD sentence?

- | | |
|--------|---------|
| (a) V | (b) III |
| (c) II | (d) VI |
| (e) IV | |

4. Which of the following will be the FIFTH sentence?

- | | |
|---------|--------|
| (a) III | (b) IV |
| (c) II | (d) VI |
| (e) I | |

5. Which of the following will be the LAST sentence?

- | | |
|---------|--------|
| (a) III | (b) IV |
| (c) V | (d) VI |
| (e) II | |

DIRECTIONS (Q. 6–10) : Rearrange the following five sentences (a), (b), (c), (d) and (e) in the proper sequence to form a meaningful paragraph; then answer the questions given below them.

- (1) A small wooden nest box is all it has taken to rekindle all the romance of bringing sparrows and other birds back into our cities and halt them from fading into the past like a forgotten folktale.

- (2) There is something wrong with a city that remains unperturbed even as its birds desert it.

- (3) Thankfully, the situation is not as hopeless as it seems.

- (4) Much as we try to defend the seemingly irreversible modern life of these cities, we can't stop our hearts from crying when we realize that our rapidly degenerating urban eco-system isn't generous enough to let these delicate winged creatures build tiny little nests in its nooks and crannies, sit in solitude, and rear offspring.

- (5) And this desertion seems to be true with most metros in India where house sparrows have almost become a thing of the past.

6. Which of the following should be the FIRST sentence after rearrangement?

- | | |
|---------|---------|
| (a) (1) | (b) (2) |
| (c) (3) | (d) (4) |
| (e) (5) | |

7. Which of the following should be the SECOND sentence after rearrangement?

- | | |
|---------|---------|
| (a) (5) | (b) (4) |
| (c) (3) | (d) (2) |
| (e) (1) | |

8. Which of the following should be the THIRD sentence after rearrangement?

- | | |
|---------|---------|
| (a) (1) | (b) (2) |
| (c) (3) | (d) (4) |
| (e) (5) | |

9. Which of the following should be the FOURTH sentence after rearrangement?

- | | |
|---------|---------|
| (a) (5) | (b) (4) |
| (c) (3) | (d) (2) |
| (e) (1) | |

10. Which of the following should be the FIFTH sentence after rearrangement?

- | | |
|---------|---------|
| (a) (1) | (b) (2) |
| (c) (3) | (d) (4) |
| (e) (5) | |

DIRECTIONS (Q. 11 to 15) Rearrange the following six sentences (1), (2), (3), (4), (5) and (6) in the proper sequence to form a meaningful paragraph; then answer the questions given below them.

1. He immediately acknowledged Mohan's good work and invited him to his home for dinner.

2. One day a wealthy merchant sent his son's bicycle to the shop for repair.
3. The next day the merchant came to claim the bicycle and noticed that it was shiny.
4. After repairing the bicycle, Mohan cleaned it up and made it look new.
5. Once upon a time, there was a boy named Mohan who worked as an apprentice in a bicycle shop.
6. Other apprentices in the shop laughed at Mohan for doing unnecessary work.
11. Which of the following should be the SECOND sentence after rearrangement ?
- (a) 1 (b) 2
(c) 3 (d) 4
(e) 6
12. Which of the following should be the THIRD sentence after rearrangement ?
- (a) 1 (b) 2
(c) 3 (d) 4
(e) 5
13. Which of the following should be the FIRST sentence after rearrangement ?
- (a) 1 (b) 2
(c) 3 (d) 4
(e) 5
14. Which of the following should be the LAST (SIXTH) sentence after rearrangement ?
- (a) 1 (b) 2
(c) 4 (d) 5
(e) 6
15. Which of the following should be the FOURTH sentence after rearrangement ?
- (a) 2 (b) 3
(c) 4 (d) 5
(e) 6
4. In the early days of the Meiji era there lived a well-known wrestler called O-nami, Great Waves.
5. In the days that followed, O-nami meditated on the advice given by the Zen master.
6. O-nami felt he should go to a Zen master for help. He approached Hakuju a wandering teacher and told him of his great trouble.
16. Which of the following should be the SECOND sentence after the rearrangement ?
- (a) 1 (b) 4
(c) 6 (d) 2
(e) 5
17. Which of the following should be the FIRST sentence after the rearrangement ?
- (a) 5 (b) 2
(c) 4 (d) 3
(e) 6
18. Which of the following should be the FIFTH sentence after the rearrangement ?
- (a) 5 (b) 4
(c) 2 (d) 3
(e) 6
19. Which of the following should be the SIXTH (LAST) sentence after the rearrangement ?
- (a) 1 (b) 4
(c) 6 (d) 5
(e) 3
20. Which of the following should be the FOURTH sentence after the rearrangement ?
- (a) 4 (b) 6
(c) 2 (d) 5
(e) 3

DIRECTIONS (Q. 16–20) : Rearrange the following six sentences 1, 2, 3, 4, 5 and 6 in the proper sequence to form a meaningful paragraph; then answer the questions given below them—

- O-nami was very strong and knew the art of wrestling. In his private spells he defeated even his teacher, but in public he was so timid, that his own pupils defeated him.
- The teacher advised him saying “Your name means Great Waves, imagine that you are huge waves sweeping everything before you, swallowing everything in your path. Do this and you will be the greatest wrestler in the country.”
- O-nami soon registered for a wrestling match and won. After that, no one in Japan was able to defeat him.

DIRECTIONS (Q. 21–25) : Rearrange the following six sentences (1), (2), (3), (4), (5) and (6) in the proper sequence to form a meaningful paragraph; then answer the questions given below them.

- At first he got scared, but then he thought, “I have never worshipped her that is why I am not able to get anything from my land.”
- One day unable to tolerate the summer heat, he went to rest under a big banyan tree.
- He rushed to his village and placed his humble offering of milk in a bowl before the snake.
- Vishnu Raman was a poor Brahmin and a farmer by profession.

5. The next day when he returned, he was rewarded with a gold coin in the bowl he left behind.
6. Just as he was preparing to lie down he saw a huge Cobra swaying with his hood open.
21. Which of the following should be the SECOND sentence after the rearrangement ?
 (a) 2 (b) 3
 (c) 5 (d) 4
 (e) 6
22. Which of the following should be the FIRST sentence after the rearrangement ?
 (a) 1 (b) 4
 (c) 6 (d) 3
 (e) 5
23. Which of the following should be the FOURTH sentence after the rearrangement ?
 (a) 5 (b) 6
 (c) 2 (d) 1
 (e) 4
24. Which of the following should be the FIFTH sentence after the rearrangement ?
 (a) 6 (b) 4
 (c) 3 (d) 2
 (e) 5
25. Which of the following should be the SIXTH (LAST) sentence after the rearrangement ?
 (a) 4 (b) 2
 (c) 3 (d) 5
 (e) 6
26. Which of the following should be the SIXTH (LAST) sentence after the rearrangement ?
 (a) 5 (b) 2
 (c) 3 (d) 4
 (e) 6
27. Which of the following should be the FIFTH sentence after the rearrangement ?
 (a) 3 (b) 4
 (c) 6 (d) 2
 (e) 5
28. Which of the following should be the FIRST sentence after the rearrangement ?
 (a) 1 (b) 4
 (c) 6 (d) 3
 (e) 2
29. Which of the following should be the FOURTH sentence after the rearrangement ?
 (a) 4 (b) 3
 (c) 2 (d) 1
 (e) 6
30. Which of the following should be the SECOND sentence after the rearrangement ?
 (a) 2 (b) 3
 (c) 6 (d) 4
 (e) 5

DIRECTIONS (Q. 26–30) : Rearrange the following six sentences / group of sentences (1), (2), (3), (4), (5) and (6) in the proper sequence to form a meaningful paragraph; then answer the questions given below them.

- (1) Seeing the dogs and his master running after the fox, the rooster screamed “No ! Don’t come near me !”
- (2) A fox sneaked into a farm and grabbed a prize rooster. The farmer saw him raised an alarm.
- (3) “My master was very cruel to me” explained the rooster to the fox. “Tell him to stay away from me.”
- (4) The rooster flew up into a tree and stayed there till he was rescued by his master.
- (5) The fox was delighted. In the process of shouting to the farmer he released his hold over the rooster.
- (6) Soon the farmer and his dogs started chasing the fox. The fox, was holding the rooster in his mouth, and was running very fast.

DIRECTIONS (Q. 31–35) : Rearrange the following six sentences/group of sentences (1), (2), (3), (4), (5) and (6) in the proper sequence to form a meaningful paragraph; then answer the questions given below :

1. To his surprise, a little honeybee came before his throne and said, “Of all the gifts you could give me, only one will do. I’d like the power to inflict great pain whenever I choose to.”
 2. I hereby give you a sharp sting. But, I am sure you will use this weapon carefully only in times of anger and strife.
 3. “What an awful wish !” said great Zeus, “But I will grant it”.
 4. And to this day, the little honeybee dies after it stings.
 5. One day, Zeus, the King of Mount Olympus, was giving out gifts to beasts, birds and insects.
 6. “You will get to use it only once, for using it will cost you your life.”
31. Which of the following should be the FOURTH sentence after the rearrangement ?
 (a) 4 (b) 6
 (c) 2 (d) 5
 (e) 3

32. Which of the following should be the **SECOND** sentence after the rearrangement ?
 (a) 1 (b) 4
 (c) 6 (d) 2
 (e) 5
33. Which of the following should be the **FIRST** sentence after the rearrangement ?
 (a) 5 (b) 2
 (c) 4 (d) 3
 (e) 6
34. Which of the following should be the **SIXTH (LAST)** sentence after the rearrangement ?
 (a) 1 (b) 4
 (c) 6 (d) 5
 (e) 3
35. Which of the following should be the **FIFTH** sentence after the rearrangement ?
 (a) 5 (b) 4
 (c) 2 (d) 3
 (e) 6
37. Which of the following should be the **SECOND** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E
38. Which of the following should be the **THIRD** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) F
39. Which of the following should be the **FIFTH** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E
40. Which of the following should be the **SIXTH (LAST)** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E

DIRECTIONS (Qs. 36-40): Rearrange the following six sentences (A), (B), (C), (D), (E) and (F) in the proper sequence to form a meaningful paragraph, then answer the questions given below them.

- (A) Do the devices that make it possible to do so many things at once truly raise our productivity or merely help us spin our wheels faster?
- (B) More important, they're exploring what can be done about it – how we can work smarter, live smarter and put our beloved gadgets back in their proper place, with us running them, not the other way around.
- (C) The dingy digital devices that allow us to connect and communicate so readily also disrupt our work, our thoughts and what little is left of our private lives.
- (D) They have begun to calculate the pluses, the minuses and the economic costs of the interrupted life – in dollars, productivity and dysfunction.
- (E) What sort of toll is all this disruption and mental channel switching taking on our ability to think clearly work effectively and function as healthy human beings?
- (F) Over the past five years, psychologists, efficiency, experts and information technology researchers have begun to explore those questions in detail.

36. Which of the following should be the **FIRST** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E

DIRECTIONS (Qs. 41-45) : Rearrange the following six sentences (A), (B), (C), (D) and (E) in the proper sequence to form a meaningful paragraph, then answer the questions given below them.

- A. It will take extraordinary political commitment and liberal public funding during the 11th Plan for affordable housing to become a credible goal.
- B. The National Urban Housing and Habitat Policy of the United Progressive Alliance Government seeks to make access to housing, long acknowledged as a fundamental right, a reality for all.
- C. The task is staggering even if we go by conservative estimates.
- D. The housing shortage to be met during the Plan is 26.53 million units, which include the backlog from the 10th Plan.
- E. If the existing stock of poor quality dwellings and the growing urbanization-driven demand are taken into account, the real deficit will be even higher.

41. Which of the following should be the **FIRST** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E
42. Which of the following should be the **SECOND** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E
43. Which of the following should be the **THIRD** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E

44. Which of the following should be the **FOURTH** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E
45. Which of the following should be the **FIFTH (LAST)** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E

DIRECTIONS (Qs. 46-50) : In each of these questions a disarranged sentence is given in which words or phrases are lettered P, Q, R and S. You are to arrange these to form a meaningful sentence.

46. P : an image of a person in meditative pose
 Q : surrounded by animal, wild and tame
 R : we have in the relics of Mohenjodaro
 S : with eyes closed and indrawn
 (a) RPSQ (b) PQSR
 (c) RQPS (d) QPRS
 (e) None of these
47. P : by her indulgent parents
 Q : the child was so spoiled
 R : when she did not receive all of their attention
 S : that she pouted and became sullen
 (a) RQPS (b) QRPS
 (c) QPSR (d) QSPR
 (e) None of these
48. P : new members
 Q : and to raise money
 R : the purpose of the meeting
 S : is to introduce
 (a) RSPQ (b) PQSR
 (c) RQPS (d) QPRS
 (e) None of these
49. P : for the future
 Q : and poses the major challenge
 R : commercial energy consumption
 S : shows an increasing trend
 (a) RPSQ (b) RSQP
 (c) RQPS (d) PRSQ
 (e) None of these

50. P : that
 Q : racialism
 R : should be wiped out
 S : people want
 (a) RPSQ (b) SPQR
 (c) RQPS (d) QPRS
 (e) None of these

DIRECTIONS (Qs. 51-55) : In each of the following questions five words are given, which are numbered I, II, III, IV and V. By using all the five words, each only once, you have to frame a meaningful and grammatically correct sentence. The correct order of the words is the answer.

Choose from the five alternatives the one having the correct order of words and mark it as your answer on the answer sheet.

51. I. interested II. in III.
 children IV. are
 V. games
 (a) III, IV, I, II, V (b) V, IV, I, II, III
 (c) III, IV, V, I, II (d) III, V, IV, I, II
 (e) III, IV, II, V, I
52. I. was II. to
 III. he IV. go
 V. ready
 (a) III, I, II, IV, V (b) I, III, IV, II, V
 (c) III, IV, II, V, I (d) I, II, IV, III, V
 (e) III, I, V, II, IV
53. I. found II. lost
 III. his IV. book
 V. we
 (a) V, II, III, I, IV (b) III, IV, II, V, I
 (c) V, I, III, II, IV (d) V, II, III, IV, I
 (e) III, IV, V, II, I
54. I. of II. he
 III. proud IV. me
 V. was
 (a) V, II, IV, I, III (b) II, V, IV, I, III
 (c) IV, V, III, I, II (d) II, V, III, I, IV
 (e) II, III, V, I, IV
55. I. decision II. happy
 III. made IV. your
 V. me
 (a) IV, III, V, II, I (b) IV, I, III, V, II
 (c) II, I, III, V, IV (d) IV, I, V, III, II
 (e) II, III, V, IV, I

ANSWER KEY													
1	(d)	9	(c)	17	(c)	25	(d)	33	(a)	41	(a)	49	(b)
2	(a)	10	(a)	18	(a)	26	(d)	34	(b)	42	(b)	50	(b)
3	(c)	11	(b)	19	(e)	27	(e)	35	(e)	43	(c)	51	(a)
4	(e)	12	(d)	20	(c)	28	(e)	36	(a)	44	(d)	52	(e)
5	(b)	13	(e)	21	(a)	29	(b)	37	(e)	45	(e)	53	(c)
6	(b)	14	(a)	22	(b)	30	(c)	38	(e)	46	(a)	54	(d)
7	(a)	15	(e)	23	(e)	31	(e)	39	(b)	47	(c)	55	(b)
8	(d)	16	(a)	24	(c)	32	(d)	40	(c)	48	(a)		

ANSWERS & EXPLANATIONS

- (d) III
- (a) V
- (c) II
- (e) I
- (b) IV

41-45. Clearly C must be followed by D, which must be further followed by the E as E reiterates the housing shortage and says that the real deficit will be even higher. D and E provide the statistical proof of the staggering task mentioned in C. So this leads us to two options (b) and (d). Among them (b) seems to be more appropriate as B again emphasises on but is being said is A and also that B cannot be the concluding statement of the paragraph. Hence, ABCDE gives the correct arrangement.

46. (a) R will be the first part since it contains the subject. Q cannot precede P as in (c) because Q describes what is in P, so Q will follow P and S.

47. (c) OPSR : The correct sequence is : The child was so spoiled by her indulgent parents that she pouted and became sullen when she did not receive all of their attention.

48. (b) RSPQ : The purpose of the meeting is to introduce new members and to raise money.

49. (b) R is the opening sentence, since it introduces the subject, S describes what is said in R and thus will follow R. P will follow Q, because the preposition 'for' will follow 'poses major challenge' and combines S and Q, thus Q follows.

50. (b) SPQR : The correct sequence is :
People want that racialism should be wiped out.

51. (a) III, IV, I, II, V

52. (e) III, I, V, II, IV

53. (c) V, I, III, II, IV

54. (d) II, III, V, I, IV

55. (b) IV, I, III, V, II

IDIOMS & PHRASES

CHAPTER

6

What are Idioms?

Idioms are words, phrases, or expressions that are either grammatically unusual, as in, "Long time, no see!", or their meaning cannot be taken literally, as in, "It's raining cats and dogs!"

This expression does not mean that cats and dogs are falling from the sky, but it is a metaphorical expression (word picture) that means that it is raining very heavily.

FOR EXAMPLE:

He cried crocodile tears because he wanted his dad to buy him something.

Just as a crocodile cannot cry, the boy was not crying at all! He was just acting!

People use idioms to make their language richer and more colorful. Idioms and idiomatic expressions can be more precise than the literal words, often using fewer words but saying more.

Some commonly used Idioms

- *Beat back* (to compel to retire) : The firemen were *beaten back* by angry flames and the building was reduced to ashes.
- *Boil down to* (to amount to) : His entire argument *boiled down* to this that he would not join the movement unless he saw some monetary gain in it.
- *Cast aside* (to reject, to throw aside) : Men will *cast aside* truth and honesty for immediate gains.
- *Cry down* (to deprecate) : Some of the Western powers did their best to *cry down* India's success in the war.
- *To cut off with a shilling* (to give someone a mere trifle in the will) : The father was so angry with the son over his marriage that *he cut him off with a shilling*.
- *Egg on* (to urge on) : Who *egged* you on to fight a professional boxer and get your nose knocked off?
- *Gloss over* (explain away) : Even if you are an important person your faults cannot be *glossed over*.
- *To laugh in one's sleeves* (to be secretly amused) : While I was solemnly reading my research paper to the audience, my friends were *laughing in their sleeves* for they knew what it was worth.
- *Play off* (to set one party against another for one's own advantage) : It best serves the interests of the super powers to *play off* one poor nation against another.
- *Pull one through* (to recover, to help one recover) : Armed with the latest medicines, the doctor *will pull him through*.
- *Cost a slur upon* (by word or act to cast a slight reproach on someone) : Many a man casts a *slur* on his own good name with some mean act.
- *To catch a Tartar* (to encounter a strong adversary) : When Hitler marched in to Russia he little knew that he would *catch a Tartar* in the tough people of that country.
- *To come off with flying colours* (to come out of a conflict with brilliant success) : The 1971 election outcome was uncertain but finally the congress *came off with flying colours*.
- *To come off second best* (to be defeated in every contest) : Be it an election or a tambola, I have always come off the second best.
- *To cut the Gordian knot* (to remove a difficulty by bold or unusual measures) : The Parliament threw out the Bill for Abolition of Privy Purses. The Government cut the Gordian knot by abolishing the privy purses through an ordinance.
- *To fall to one's lot* (to become one's fate): It fell to the lot of Mujib and his colleagues to reconstruct the shattered economy of their nation.
- *To get into hot water* (to get into difficulty): The businessman *got into hot water* with the Income-tax authorities for concealing his income from ancestral property.
- *To give someone the slip* (to dodge someone who is looking for you): The police had nearly got the dacoits when the *latter gave them the slip* in the Chambal ravines.
- *To go on a fool's errand* (to go on an expedition which leads to a foolish end): Many people earlier believed that going to the moon was like *going on a fool's errand*.
- *To go to the wall* (to get the worst in a competition): In the struggle of life, the weakest *goes to the wall*.
- *To go to rack and ruin, to go to the dogs* (to be ruined): If a big war comes, our economy will *go to the dogs*.
- *To have one's hands full* (to be very busy): Pakistan could hardly expect active help from the U.S.A. *as her hands were already full with Vietnam, Laos and West Asia problems*.
- *To have a bone to pick with one* (to have a difference with a person which has not yet been fully expressed). The extreme leftists *have a bone to pick* with the police and if ever they come to power there may be unpleasantness between the two.
- *To have the whip hand of* (to have mastery over): After the split in the party Mrs. Gandhi has *the whip hand of* the Congress.
- *To have too many irons in the fire* (to have so much work in hand that some part of it is left undone or is done very badly): Let the Government not go in for nationalisation so fast. If they *have too many irons in the fire* they are bound to fare badly.

- *To have the tree or right ring* (To be genuine): Nixon's pronouncements on world peace do not *have the right ring*.
- *To have two strings to one's bow* (to have an alternative means of achieving one's purpose): A wife always has *two strings to her bow* if coaxing fails to achieve the desired end; tears succeed.
- *To have an axe to grind* (have personal interests to serve): Bigger nations supply arms to the smaller ones primarily because they (the bigger nations) *have their own axe to grind*.
- *To keep the wolf from the door* (to keep away extreme poverty and hunger): Lakhs in India have to struggle everyday to *keep the wolf from the door*.
- *To make short work of* (to bring to sudden end): The locusts *made short work of* the ripe standing corn.
- *To make amends for* (to compensate for damage): By his kindness today he has made *amends for* his past insolence.
- *To make common cause with* (to unite, to co-operate with): During the last elections the princes *made a common cause with* the rightist parties. Both went down.
- *To make a virtue of necessity* (to do a very disagreeable thing as though from duty but really because you must do it): When a minister knows that he is going to be booted out of the cabinet he *makes a virtue of necessity* and resigns on health grounds.
- *To make much ado about nothing* (make a great fuss about a trifle): Demonstrations and protests over the change in the timing of news bulletins over AIR was *making much ado about nothing*.
- *To make a cat's paw or a tool of someone* (to use someone as a means of attaining your object): The super-powers have *made a cat's paw of* the smaller nations of Asia in their game of power politics.
- *To play into the hands of someone* (to act as to be of advantage to another) By raising the slogan 'Indira Hatao' the opposition *played into her hands* and Mrs. Gandhi won the elections hands down (easily).
- *To play second fiddle* (to take a subordinate part) : With Mrs. Gandhi as the undisputed leader of the Congress and the nation, everyone else is content to *play second fiddle to her*.
- *To put the cart before the horse* (to begin at the wrong end to do a thing): Preparing the blue print of a project without the provision of funds is like *putting the cart before the horse*.
- *To put one's shoulder to the wheel* (to make great efforts ourselves): No amount of foreign aid will pull us out of the economic morass; we have to *put our own shoulders to the wheel*.
- *To set store by* (to value highly): India, *surely sets much store by* the Indo Soviet Treaty of Friendship.
- *To set the Thames on fire* (to do something extraordinary): He is a steady worker but never likely to *set the Thames on fire*.
- *To set one's house in order* (to arrange one's affairs): Let Pakistan *set her own house in order* before talking of the welfare of the Kashmiris.
- *To take into one's head* (to occur to someone): The Manager *look it into his head* that by shutting off the electricity for a few hours daily he could save on refrigeration costs.
- *To take the bull by the horns* (to grapple with a problem courageously instead of avoiding it): There is no short cut to prosperity. We have to *take the bull by the horns* and make people work like slaves.
- *To take a leap in the dark* (to do a hazardous thing without any idea of what it may result in): You *took a leap in the dark* in going into partnership with that man.
- *To throw cold water upon* (to discourage something): The doctor *threw cold water upon* my plans for a world tour by declaring that I could never stand the strain of it.
- *To throw up the sponge* (to give up a contest): Faced with stiff competition from big companies, many a small company will *throw up the sponge*.
- *To turn over a new leaf* (to change one's course of action completely): After a long career of crime the convict suddenly *turned over a new leaf* and became a model citizen.
- *To turn tail* (to retreat ignominiously): The enemy *turned tail* in the face of heavy onslaughts on its key positions.
- *To turn the tables* (to reverse someone's success or superiority): Pakistan started war with a blitz on our positions but the superior tactics of our Armed Forces soon *turned the tables* on them.
- *To cook or doctor an account* (to tamper with or falsify the account): From the balance sheet presented to the shareholders, the company seemed to be flourishing, but it afterwards turned out that the Secretary had *cooked the accounts*.
- *To bear the brunt of* (to endure the main force or shock of): The infantry has to *bear the brunt of* a battle.
- *To beard the lion in his den* (to oppose someone, in his stronghold): The Indian Army broke through strong Pakistani fortifications, and in the Shakargarh area *bearded the lion in his own den*.
- *To bid fair to* (to give fair prospect of): His health is so good that he *bids fair to* live till he is sixty.
- *To blow one's own trumpet* (to parade one's own good deeds): Modesty does not pay. Only if you *blow your own trumpet*, you can succeed.
- *To blunt the edge of* (to make something less effective): Time *blunts the edge of* grief.
- *To build castles in the air* (to indulge in reveries or visionary schemes): There is nothing wrong if you *build castles in the air*; now put foundations under them.
- *To burn the candle at both ends* (to use too much energy): Our resources are limited. Let us use them judiciously and not *burn the candle at both ends*.
- *To buy a pig in a poke* (to purchase a thing without previously examining it): Buying shares in a new Company started by unknown entrepreneurs is like buying a *pig in a poke*.
- *To cross or pass the Rubicon* (to take a decisive step forward): The Government will have to think of many things before nationalising the textile industry for once they *cross the Rubicon* there will be no going back.
- *To cry over spilt milk* (to nurse unnecessary regrets): We have failed to build up a sizeable total against England's meagre first innings total. It is no use crying *over spilt milk* now.
- *To err on the safe side* (to choose a course which may in fact be inaccurate, but which will keep you safe from risk or harm): In going *in* for mixed economy rather than wholesale nationalisation the Government were *erring on the safe side*.

- *To flog a dead horse* (waste one's energies): We are *flogging a dead horse* if we are trying to make Sanskrit the national language of India.
- *To feather one's nest* (to provide for oneself through dishonest means): Many tax collectors make a point of *feathering their own nests* well while they have opportunity.
- *To Eat one's heart out* (to brood over one's sorrows or disappointments): Don't *eat your heart out* over failure in this competition.
- *To eat humble pie* (to have to humiliate oneself): Since none came to his support he had to eat *humble pie* and give in to their demands.
- *To eat one's words* (to retract one's assertions under compulsion): It is hard for a haughty man to have to *eat his words*.
- *To throw down the gauntlet, to take up the gauntlet* (to offer or give a challenge, to accept a challenge): It is not for a small country to throw down the gauntlet to the right and the left.
- *To run the gauntlet* (to undergo severe criticism or ill treatment): Most trend-setting books have to *run the gauntlet* of the literary critics.
- *To burn one's fingers* (to get oneself into unexpected trouble): They were happily placed in the woollen industry. But they went in for cosmetics and *burnt their fingers*.
- *To force one's hands* (to compel one to do something unwillingly or earlier than he wished to do it): The Government wanted to do all that they could to meet the workers' demands. But the violence by the strikers *forced their hands* to declare a lockout.
- *To haul over the coals* (to scold a man, reprove him): If your bad habits become known, you will get *hauled over the coals* and richly deserve it.
- *To let the grass grow under your feet* (to be inert and passive to things around): The authorities should listen to students' grievances. By being indifferent they would only *let the grass grow under their feet* till it will be too late to turn these young people away from the path of violence.
- *To put in a nutshell* (this is said of a thing which is capable, of, or presented in, brief expression): His conduct is weird. To *put in a nutshell* he is insane. The explanation of his conduct can be *put in a nutshell* - he is insane.
- *To let loose the dogs of war* (to set in motion the destructive forces of war): Pakistan has *let loose the dogs of war* in Kashmir, through organized terrorism.
- *To lord it over someone* (to dominate over someone, to act as a lord): The love of power is so strong in human nature, that when a man becomes popular he seeks to *lord it over* his fellows.
- *To mind one's Ps and Qs* (to be punctilious): The manager suspects his chief clerk of dishonesty, and if the clerk does not *mind his Ps and Qs*, he will soon find himself without a job.
- *To muster in force* (to assemble in large numbers): The citizens *mustered in force* to welcome their beloved leader.
- *To pay one back in one's own coin* (to give tit for tat, to retaliate): Howsoever revengeful you may be, unless you are strong enough you cannot *pay him back in his own coin*.
- *To plough a lonely furrow* (to work without help or support): In the organised society of today no individual or nation can *plough a lonely furrow*.
- *To poison the ears or mind* (to prejudice another person): A judge must not allow anyone to *poison his mind* against either the plaintiff or the defendant.
- *To rest on one's laurels* (to rest satisfied with honours already won, and to make no attempt to gain further distinction): Even if he wins the biggest award, a film star will never *rest on his laurels*. He will try to rise higher and higher.
- *To rest on one's oars* (to suspend efforts after something has been attained): The agitators have been vigorously at work during the winter, but at present they seem to be *resting on their oars*.
- *To harp on the same string* (to keep repeating the same sentiment over and again): This gentleman *keeps harping on the same string*: he is from Oxford and deserves this and deserves that etc.
- *To rise like a phoenix from its ashes* (the phoenix was a fabulous Arabian bird. It had no mate but when about to die, made a funeral pile of wood and aromatic gums and on it burned itself to ashes. From the ashes a young phoenix was believed to rise): Germany was completely decimated in the second world war. But she has *risen like a phoenix from its ashes*.
- *To rule the roost or roost* (to lord it over others in a party or group): In almost every party there is some overbearing person who tries to *rule the roost*.
- *To run in the same groove* (to move forward on the same path, to advance in harmony): It is clear that the ideas of both reformers *run in the same groove*.
- *To run in the blood* (a peculiarity which clings to certain families). Snobbery *runs in the blood* of the Englishmen.
- *To scatter to the winds* (to waste, to scatter abroad): We have *scattered to the winds* what we had gained by our independence.
- *To be on the right scent* (to be on the right track): The customs have decided to patrol the Kerala seas to nab smugglers from Dubai. They are *on the right scent* (Its opposite is to be on the wrong scent or wrong track)
- *To see how the wind blows* (to observe what influence, favourable or adverse, is likely to affect the existing state of things): In party-politics people sitting on the fence keep on watching *how the wind is blowing* before deciding on their options.
- *To see a thing through coloured glasses* (to regard something favourably because of one's prejudice): Pakistan has for long *looked at India through coloured glasses* and never trusted even the most genuine gestures for peace. (The world is a place of strife and one should not see it through coloured glasses.)
- *To show the white feather* (to show signs of cowardice): The agitators shouted and gesticulated but the moment the police appeared on the scene they seemed to *show the white feather*.
- *To sow broadcast* (to scatter widely or without stint): The emissaries of the banished king were *sowing sedition broadcast*.
- *To split hairs* (to make subtle and useless distinctions): As the drought played havoc in Bihar, the authorities were busy *splitting hairs* trying to decide whether it was 'scarcity conditions' or famine.

- *To steal a march* (to gain an advantage over another stealthily): While we were still debating the desirability of joint ventures with foreign concerns, Singapore and Malaysia *stole a march* over us and opened their gates to foreign investment in a big way.
- To *steer clear of* (to avoid): India decided on non-alignment to *steer clear of* the hazards of alignment with one block or the other.
- To *stick at nothing* (the phrase implies readiness to stoop to baseness or deception to reach one's end): An ambitious politician will *stick at nothing* if he can only serve himself.
- To *strain every nerve* (to use one's utmost efforts): We have to *strain every nerve* to get over the poverty line.
- To *strike while the iron is hot* (to take advantage of the opportunity when it arises): If you want to succeed in life, you must *strike the iron while it is hot*. In going in for general elections immediately after the war, the Congress *struck while the iron was hot*.
- To *swallow the bait* (to catch others by guile, by offering them large promises): The candidate offered the people everything on earth and in the heavens if selected. The people *swallowed the bait* and elected him.
- To *talk shop* (to use the phrases peculiar to one's circumstances): Except for the undertakers, people of the same professions always *talk shop* at parties.
- To *tie one's hands* (to restrain one from action): The *Government's hands are already tied* with problem plants. It would not like to go in for nationalisation in a big way.
- To *tread on the heels of* (follow close behind): Famine *treads on the heels* of drought.
- To *fish in troubled waters* (to make personal profit out of a disturbance): The super powers are *there in West Asia to fish in troubled waters*.
- To *pour oil on troubled waters* (to say or do anything which soothes and calms angry passions): The government *poured oil on troubled waters* by announcing a judicial enquiry into the firing.
- To *win or gain laurels or to bear away palm* (to achieve success in a contest): The Indian Cricket Team *won laurels* on two successive occasions once in West Indies and then in England.
- To *worship the rising sun* (to pay respect to the man who is rising in power the influence): The newly appointed manager has taken over and his clerks *worship the rising sun*.
- *Argus-eyed* (jealously watchful). The husband of a pretty wife has got to be *Argus-eyed*.
- *Aegean stables*: (to clean Aegean stables, To correct a great abuse, from the stables of king Agues of Greece, whose stables had not been cleaned for thirty years): The law against prostitution has cleaned no Aegean stables; it has merely pushed it underground.
- *Backstairs influence* (influence exerted secretly and in a fashion not legitimate): The moneyed people do exercise *backstairs influence* on Parliament.
- *Bad blood*: (active enmity): There has been *bad blood* between India and Pakistan since 1947.
- *A bone of contention* : (subject of dispute): Kashmir continues to be *a bone of contention* between India and Pakistan since 1947.
- *A bosom friend* (A very intimate and trusted friend): Bosom friends never betray one another.
- *A bull in a China shop*: (Someone who destroys everything at the same time he happens to be in): The plainsmen proved to be *a bull in a China shop* in the hills, ruining the hill people in all ways.
- *A close shave*: (a narrow escape from collision accident): The bus had a close shave as its driver swerved to the right a split second before the on-coming truck could run into it.
- *A cold comfort*: (something calculated to cause pain or irritation): The promise of a better future is only *cold comfort* to the frustrated youth of today.
- *A dog in the manger policy*: (said of a person who cannot himself use what another wants, and yet will not let that other have it): The affluent nations are *a dog-in-the manger*, destroying what they can't use themselves than giving it to the poor nations of Asia and Africa.
- *Elbow room*: (opportunity for freedom of action): Only give him *elbowroom* and he will succeed.
- *A fair-weather Friend*: (one who deserts you in difficulties): *A fair-weather friend* disappears the moment your money disappears.
- *French leave*: (*absence without permission.*) He went on a *french leave* and was summoned by the direction the next day he went to office.
- *Good offices*: (recommendation): One can get a good job only through the *good offices* of some one in power.
- *A good Samaritan*: (one who be-friends a stranger or a friendless person): Centuries ago, India played *a good Samaritan* to the hapless Parsees fleeing their native land.
- *The green-eyed monster*: (jealousy): The *green-eyed monster* strikes a woman the moment she sees her husband talking to a pretty woman.
- *A Herculean task* (a job requiring great efforts): Eradication of poverty is a *Herculean task* requiring the collective efforts of the entire country.
- *Lynch Law*: (the practice of punishing people where the punishment is inflicted by unauthorised persons and without judicial trial): Mob law denotes the same thing when carried out by a mob. In African countries they often resort to *lynch laws*.
- *A maiden speech* (the first speech of a new member in a public body as in Town Hall or in Parliament): Amitabh's *maiden speech* was very impressive.
- *A nine day's wonder* (*a fascinating but temporary phenomenon*): *Beauty is, proverbially, a nine day's wonder*.
- *An open question*: (*a matter for discussion and not yet decided*): As far as India is concerned, Kashmir is no longer *an open question*.
- *A red-letter day*: (an auspicious, fortunate or important day): The 26th January, 1950 is *a red-letter day* in India's history.
- *Scot-free*: (exempt from payment, unhurt, safe): Because he had influential connections, the culprit went *scot-free*.
- *A sheet anchor*: (the chief safety, the last refuge for safety): One's faith in God is one's *sheet anchor* in times of stress and strain.
- *Tall Talk*: (boastful language): If we have no real accomplishments, we indulge in tall *talk* to delude ourselves and others too.
- *A white elephant* (an unprofitable possession): The upper Houses are *white elephants* and should be abolished.
- *A white lie*: (an evasion, a harmless and non-malicious untruth): Professional members often indulge in *white lies*.

- *A wild goose chase* (a foolish, wild, unprofitable adventure): Attempts towards stabilisation of prices in a developing economy, is a *wild goose chase*.
- *An apple of discord*: (a subject of envy and strife): Kashmir continues to be the *apple of discord* between India and Pakistan.
- *Cock and bull story* (a silly improbable story): That India wanted to break up West Pakistan was a *cock and bull story* published by the U.S.A.
- *A fish out of water* : (a person in uncomfortable surroundings): An Indian may earn tons of money in the Western countries, but he will always feel like a *fish out of water* there.
- *The gift of the gab*: (fluency of speech): The *gift of the gab* combined with a slight cunning makes for a successful politician.
- *Lion's share*: (an unfairly large share): The big nations continue to have the *lion's share* of world trade.
- *A mare's nest* : (a discovery that turns out to be false or worthless): There was much fanfare about the solar cooker. Later it turned out to be a *mare's nest*.
- *The milk of human kindness*: (kindly feelings a phrase used by Shakespeare.): With all their poverty, Indians do not lack the *milk of human kindness*.
- *Penelope's web* : (a work which seems to be going on and yet never comes to an end.): A housewife's chores are a *penelope's web*.
- *The pros and cons of a question*: (arguments for and against a thing) They discussed the *pros and cons* of the matter before taking a decision.
- *The skin of one's teeth*: (a phrase used when one escapes losing everything except life.): The storm broke up the ship but the sailors escaped by the *skin of their teeth*.
- *A snake in the grass*: (a secret foe.): China has certainly been a *snake in the grass* for India. Even in the heyday of Hindi Chini bhai-bhai, she was quietly devouring bits of our territory.
- *A stone's throw*: (very near.): The Taj Hotel is at a *stone's throw* from the Gateway of India.
- *All moonshine*: (foolish, idle, untrue statement.): The talk about welfare of the poor is all *moonshine*.
- *Behind the scenes* : (Of a person having secret or private information and influence): The dismissed Secretary, having been *behind the scenes*, has made some strange revelations as to the way in which the business is managed.
- *Between two fires* : (assailed or shot at from two sides): A man, arbitrating between the mother and wife, is to be *between the two fires*, for his decisions can rarely please both.
- *In a body*: (together) The striking workers went in a *body* to the Manager to present their demands.
- *Wide off the mark or beside the mark*: (irrelevant): 'Beside the mark reasoning or argument'.
- *Cheek by jowl*: (in the same position): There was a lawyer who never had a client *cheek by jowl* with a doctor who never had a patient.
- *Out at elbows*: (destitute): The rising prices and the new taxes may soon see most of us *out at elbows*.
- *Part and Parcel*: (integral part of a society, community etc.) Some customs and traditions are a part and parcel of Indian culture.
- *A storm in a tea cup*: (a great fuss about a trifle): The crackers fired by Diwali revellers caused a *storm in the tea cup* when minority communities thought it to be a bomb attack by the other community.
- *A fly in the ointment* : (a trifling circumstance which mars enjoyment): It was a wonderful picnic, the only *fly in the ointment* being the absence of shady trees at the picnic spot.
- *Not worth his salt*: (good for nothing): A soldier who shivers at the boom of guns is not worth his salt.
- *With a pinch of salt*: (to take a statement with a grain of salt is to feel some doubt whether it is altogether true): Shaw's claim of having remained a celibate even after marriage has to be taken with a pinch of salt.
- *Null and void*: (Invalid, valueless, no longer in force): The court declared the appointment to be null and void.
- *To be posted up*: (well acquainted with): I want to be posted up in Indian History.
- *To be worth its weight in gold*: (extremely valuable): In the desert a bottle of water is often worth its weight in gold.
- *To be Greek or double Dutch to one*: (unintelligible): He spoke so fast that all he said was double Dutch to the audience.
- *To be within an ace of* (to be very nearly): He was within an ace of being shot.
- *To be at the beck and call*: (to be always ready to serve): You must not expect me to be at your beck and call, I have my own business to attend to.
- *To be at daggers drawn* : (in bitter enmity): With every passing year the hostility between the Arabs and the Israelis has grown more bitter. They have always been at daggers drawn.
- *To be at sea*: (contused, uncertain of mind): I am quite at sea in Mathematics.
- *To be at one's wits end*: (perplexed): With the master shouting from the bathroom and the mistress from the kitchen the servant was at his *wits end* as to whom to attend first.
- *To be in one's element*: (to be in agreeable company or work): Shaw is in his element when he is writing about the social ills of his time.
- *To be on wane*: (to be on the decline): After the second World War, the British Empire was on the wane.
- *To be on the carpet*: (to be summoned to one's employer's room for reprimand): The unpunctual clerk was repeatedly on the carpet.
- *To be on the last legs*: (about to collapse): With science dominating life more and more, religion seems to be on its last legs.
- *Chip of the old block* (a son who is very like his father): The younger Nawab of Pataudi has proved to be a *chip of the old block*. He is as good a batsman as his father.
- *To bring under the hammer*: to sell it by auction. If a person goes insolvent, his creditors will bring everything that he owns under the hammer to recover their money.
- *To pay one's way*: (not get into debt): While at college, he paid his way by working as a newspaper vendor.
- *To strike one's flag or colours or to show the white flag* : to surrender
- *To weather the storm*: (to come out of a crisis successfully): In a crisis it is unity which helps a nation to weather the storm.

- *To sail before the wind: (to go in the direction towards in which the wind is blowing): An opportunist is he who sails before the wind (Its opposite is to sail close to the wind i.e. to break a law or principle)*
- *To be in the same boat (To be equally exposed with a person to risk or misfortune):* In a nuclear war, the rich and the poor nations will be in the same boat. None will be able to protect themselves.
- *To sail under false colours: (To pretend to be what one is not, to try to deceive):* In our blessed country, a smuggler sailing under the false colours of a socialist will never be exposed.
- *To take the wind out of one's sails: (Frustrating him by anticipating his arguments, take away his advantage suddenly):* Before the U.S. could spread the canard about India's intention to destroy West Pakistan after "capturing" Bangladesh, India took the wind out of their sails by declaring a unilateral cease-fire.
- *Game is not worth the candle: (The advantage or enjoyment to be gained is not worth the time spent in gaining it)* Journey to the moon is an elaborate and costly affair and some people with a pragmatic approach feel the game is not worth the candle.
- *Not fit to hold a candle to: (One is inferior):* For all his pious platitudes and political stunts, Mr. Nixon is not fit to hold a candle to Lincoln or Roosevelt.
- *Hope springs eternal in the human breast: one never loses hope.*
- *Fools rush in where angels fear to tread : said of reckless persons.*
- *He who pays the piper calls the tune: One has to act according to the wishes of one's master*
- *You cannot make a silk purse out of sow's ear : said of something impossible.*
- *A bird in hand is worth two in the bush: right use of the present opportunity.*
- *One man's meat is another man's poison : what is good for one may be harmful for another person.*
- *Out of the frying pan into the fire : From one trouble to another.*
- *The last straw breaks the camel's back: The smallest addition to an already heavy task makes it intolerable.*
- *Distance lends enchantment to the old. Things look nice and beautiful when they are not within reach.*
- *Render unto Caesar what is Caesar's. To be wise.*
- *Look before you leap : Don't be reckless and impulsive.*
- *Make hay while the sunshines: To make/ill use of the given opportunity.*
- *Never look a gift horse in the mouth: There can be no choice about things given in charity.*
- *Beggars can't be choosers. No choice in scarcity.*
- *Nearer the Church, farther from heaven: The more opportunity you have, the less you benefit from it.*
- *Every cock fights best on his own dunghill: One is very brave and confident in one's own place.*
- *A rolling stone gathers no moss. An aimless person cannot succeed Rome was not built in a day : things take time to complete and to mature. One swallow does not make a summer. One person can't do everything*
- *Apparel proclaims the man: You judge a man's worth by his clothes.*
- *To run with the hare, to hunt with the hound. To be insincere to someone.*
- *Sweet are the uses of adversity. Sufferings are to be welcomed*
- *Uneasy lies the head that wears the crown: With power and authority come worries and responsibilities.*

EXERCISE

DIRECTIONS (Qs. 1 to 50): In each of the following sentences, an idiomatic expression or a proverb is highlighted. Select the alternative which best describes its use in the sentence.

1. There was no opposition to the new policy by the **rank and file** of the Government.
 - (a) the official machinery
 - (b) the ordinary members
 - (c) the majority
 - (d) the cabinet ministers
 - (e) None of these
2. The clerk **wiped the nose** of his employer by submitting a false bill and was dismissed from his job.
 - (a) Cleaned the nose
 - (b) Cheated
 - (c) Abused
 - (d) Slapped
 - (e) none of these
3. **I have a bone to pick** with you in this matter.
 - (a) Am in agreement
 - (b) Am angry
 - (c) Am indebted
 - (d) Will join hands
 - (e) None of these
4. The new CM **stuck his neck out** today and promised 10kgs. free wheat a month for all rural families.
 - (a) took an oath
 - (b) took a risk
 - (c) extended help
 - (d) caused embarrassment
 - (e) None of these
5. Harassed by repeated acts of injustice he decided to **put his foot down**.
 - (a) not to yield
 - (b) resign
 - (c) to accept the proposal unconditionally
 - (d) withdraw
 - (e) none of these
6. He has built a big business empire by his **sharp practices**.
 - (a) extreme hard work
 - (b) keen business skills
 - (c) dishonest dealings
 - (d) sharp intelligence
 - (e) none of these
7. The secretary and the treasurer are **hand in glove** with each other.
 - (a) very good friends
 - (b) constantly fighting
 - (c) associates in some action
 - (d) suspicious of each other
 - (e) none of these

8. He never liked the idea of keeping his wife **under his thumb** and so he let her do what she liked.
 (a) Pressed down
 (b) Unduly under control
 (c) Below his thumb
 (d) Under tyrannical conditions
 (e) none of these
9. It is time that professors came down from their **ivory towers** and studied the real needs of the students.
 (a) Detachment and seclusion
 (b) A tower made of ivory
 (c) Prison
 (d) Dream lands
 (e) none of these
10. You have to be a **cool customer** and be patient if you want to get the best buys.
 (a) Be calm and not be excitable
 (b) Have a cool head
 (c) Be uncommunicative
 (d) Be choosy
 (e) none of these
11. The class could not **keep a straight face** on hearing the strange pronunciation of the new teacher.
 (a) remain silent (b) remain serious
 (c) remain mute (d) remain disturbed
 (e) none of these
12. The parliamentary inquiry into the Bofors deal did not **bring to light** any startling facts.
 (a) Prove (b) Probe
 (c) Highlight (d) Disclose
 (e) none of these
13. His speech **went down well with** the majority of the audience.
 (a) found acceptance with
 (b) was attentively listened to by
 (c) was appreciated by
 (d) was applauded by
 (e) none of these
14. Rohit has **bitten off more than he chew**.
 (a) Is trying to do much
 (b) Is very greedy
 (c) Is always hungry
 (d) Has little regard for others
 (e) none of these
15. The detective **left no stone unturned** to trace the culprit.
 (a) took no pains
 (b) did very irrelevant things
 (c) resorted to illegitimate practices
 (d) used all available means
 (e) none of these
16. He believes in the policy of **making hay while the sun shines**.
 (a) giving bribes to get his work done
 (b) seeking advice from one and all
 (c) helping those who help him
 (d) making the best use of a favourable situation
 (e) none of these
17. His friends advised him to be **fair and square** in his dealings.
 (a) Careful (b) Considerate
 (c) Polite (d) Upright
 (e) none of these
18. It is **high time** that India did something about the population problem.
 (a) already late (b) appropriate time
 (c) desired occasion (d) auspicious moment
 (e) none of these
19. He is always **standing up** for the weak and oppressed.
 (a) Boosting the claims of
 (b) Championing the cause of
 (c) Seeking help of others for
 (d) Moving about with
 (e) none of these
20. We should **give a wide berth** to bad characters.
 (a) give publicity to (b) publicly condemn
 (c) keep away from (d) not sympathise with
 (e) none of these
21. The authorities **took him to task** for his negligence.
 (a) gave him additional work
 (b) suspended his assignment
 (c) reprimanded him
 (d) forced him to resign
 (e) none of these
22. In spite of the immense pressure exerted by the militants, the Government has decided not to **give in**.
 (a) accede (b) yield
 (c) oblige (d) confirm
 (e) none of these
23. Their business is now **on its last legs**.
 (a) About to fructify
 (b) About to perish
 (c) About to produce results
 (d) About to take off
 (e) none of these
24. He **went back on** his promise to vote for me.
 (a) withdrew (b) forgot
 (c) reinforced (d) supported
 (e) none of these
25. The old beggar **ran amuck** and began to throw stones at the passerby.
 (a) became desperate (b) ran about wildly
 (c) become annoyed (d) felt disgusted
 (e) none of these
26. Turban is **in vogue** in some communities.
 (a) in fashion (b) out of use
 (c) vaguely used (d) never used
 (e) none of these
27. The old man was **cut to the quick** when his rich son refused to recognise him.
 (a) surprised (b) hurt intensely
 (c) annoyed (d) irritated
 (e) none of these
28. I requested him to **put in a word for me**.
 (a) introduce (b) assist
 (c) support (d) recommend
 (e) none of these
29. The dacoit murdered the man **in cold blood**.
 (a) coldly (b) boldly
 (c) ruthlessly (d) deliberately
 (e) none of these
30. He is always **picking holes** in every project.
 (a) creating problems in
 (b) finding fault with
 (c) suggesting improvement in
 (d) asking irrelevant questions on
 (e) None of these

31. The **die is cast** and now let us hope for the best.
 (a) project is over (b) decision is made
 (c) death is inevitable (d) cloth has been dyed
 (e) none of these
32. Pt. Nehru was born with a **silver spoon in his mouth**.
 (a) born in a middle class family
 (b) born in a wealthy family
 (c) born in a royal family
 (d) born in a family of nationalists
 (e) none of these
33. The arrival of the mother-in-law in the family proved a **rift in the lute**.
 (a) caused unnecessary worries
 (b) brought about disharmony
 (c) caused a pleasant atmosphere
 (d) brought about a disciplined atmosphere
 (e) none of these
34. The prince did not **take after** the king.
 (a) run after (b) follow
 (c) precede (d) resemble
 (e) none of these
35. Don't lose patience, things will improve **by and by**.
 (a) soon (b) finally
 (c) gradually (d) unexpectedly
 (e) none of these
36. Having sold off his factory, he is **now a gentleman at large**.
 (a) Has no serious occupation
 (b) Is living comfortably
 (c) Is respected by everybody
 (d) Is held in high esteem
 (e) none of these
37. Though he has lot of money, yet all his plans are **built upon sand**.
 (a) established on insecure foundations
 (b) based on inexperience
 (c) resting on cheap material
 (d) resting on immature ideas
 (e) none of these
38. His plan was so complicated that it **floored** his listeners.
 (a) entertained (b) puzzled
 (c) annoyed (d) encouraged
 (e) none of these
39. There has been **bad blood** between the two communities even before shouting.
 (a) Impure blood (b) Ill feeling
 (c) Bloody fights (d) Quarrels
 (e) none of these
40. The curious neighbors were disappointed as the young couple's quarrel was just a **storm in a tea cup**.
 (a) violent quarrel (b) fuss about a trifle
 (c) brittle situation (d) quarrel about tea cups
 (e) none of these
41. Mohan always keeps **himself to himself**.
 (a) Is too busy (b) Is selfish
 (c) Is unsociable (d) Does not take sides
 (e) none of these
42. While the ladies continued their **small talk** in the drawing room, I felt bored.
 (a) whispering (b) backbiting
 (c) gossip (d) light conversation
 (e) none of these
43. My car **broke down** on way to the railway station.
 (a) stopped (b) met with an accident
 (c) ran out of petrol (d) failed to work
 (e) none of these
44. My father **strained every nerve** to enable me to get settled in life.
 (a) worked very hard (b) spent a huge amount
 (c) tried all tricks (d) bribed several persons
 (e) none of these
45. Madhuri might **scream blue murder**, but I feel Deepali should get the promotion since she is better qualified for the job.
 (a) Someone has been murdered with some blue liquid
 (b) Someone is being murdered and has become blue
 (c) Suffer from persecution complex
 (d) Make a great deal of noise and object vehemently
 (e) none of these
46. He went to his friend's house in the evening **as was his wont**.
 (a) as usual (b) as he wanted
 (c) as his want was (d) as he wanted that day
 (e) none of these
47. Why do you wish to **tread on the toes**?
 (a) To give offence to them
 (b) To follow them grudgingly
 (c) To treat them indifferently
 (d) To be kicked by them
 (e) None of these
48. He intends **setting up** as a lawyer in the adjoining district.
 (a) To establish himself (b) To migrate
 (c) To join (d) To settle
 (e) None of these
49. The autographed bat from the famous cricketer Sunil Gavaskar is **worth a jew's eye**.
 (a) Not a worthy possession
 (b) unnecessary
 (c) A costly items
 (d) A possession of high value
 (e) None of these
50. The speaker gave a **bird's eye view** of the political conditions in the country.
 (a) a personal view (b) a general view
 (c) a biased view (d) a detailed presentation
 (e) None of these

ANSWER KEY

1	(b)	6	(c)	11	(b)	16	(d)	21	(c)	26	(a)	31	(b)	36	(a)	41	(c)	46	(a)
2	(b)	7	(a)	12	(d)	17	(d)	22	(b)	27	(b)	32	(b)	37	(d)	42	(d)	47	(a)
3	(b)	8	(b)	13	(c)	18	(a)	23	(b)	28	(d)	33	(b)	38	(b)	43	(a)	48	(a)
4	(b)	9	(a)	14	(a)	19	(b)	24	(a)	29	(c)	34	(d)	39	(b)	44	(a)	49	(d)
5	(a)	10	(a)	15	(d)	20	(c)	25	(b)	30	(b)	35	(c)	40	(b)	45	(d)	50	(b)

ANALOGY

ANALOGY

Analogy literally means 'similarity' or having similar features. Questions on analogy test the ability of a candidate to understand the relationship between two given objects or words or numbers that are asked in the question. These type of questions cover all types of relationships that one can think of, there are many ways of establishing a relationship.

TYPES OF QUESTIONS

► Type I Word Analogy

ILLUSTRATION ► 1 : Ocean : Pond :: Kilometer : ?

- (a) Volt
- (b) River
- (c) Meter
- (d) Second
- (e) Kilogram

Sol. (c) As 'Pond' is a small unit of 'Ocean', similarly 'Meter' is a small unit of 'Kilometer'.

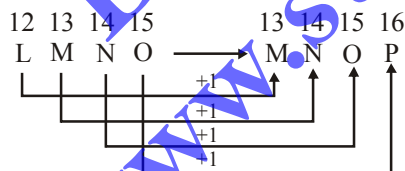
Thus, ? ⇒ Meter

► Type II Letter Analogy

ILLUSTRATION ► 2 : LMNO : MNOP :: STUD : ?

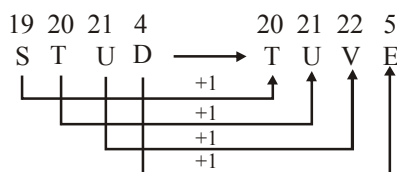
- (a) TUVW
- (b) TUEV
- (c) TUVE
- (d) TTVE
- (e) None of these

Sol. (c)



Here, we observe that each letter of 'LMNO' is increasing by 1.

Similarly,



Thus, ? ⇒ TUVE

► Type III Number Analogy

ILLUSTRATION ► 3 : 635768 : 867536 :: 819578 : ?

- (a) 785918
- (b) 875981
- (c) 875819
- (d) 818759
- (e) None of these

Sol. (e) 635768 → 867536

Here, we observe that all the digits of number '635768' are written in reverse order.

Similarly,

819578 → 875918

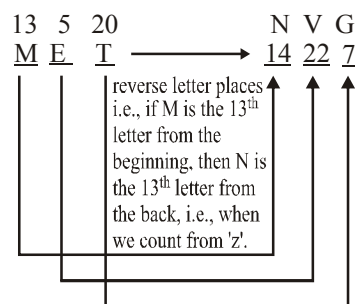
Thus, ? ⇒ 875918

► Type IV Letter and Number Analogy

ILLUSTRATION ► 4 : MET : 14227 :: DAM : ?

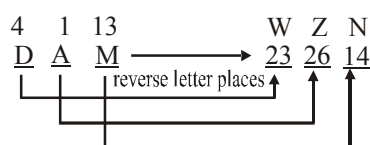
- (a) 23263
- (b) 232613
- (c) 236213
- (d) 232614
- (e) None of these

Sol. (d)



Here, we observe that the each letter of 'MET' is numbered in reverse order.

Similarly,



Thus, ? ⇒ 23 26 14

ILLUSTRATION ▶ 5 : $\frac{M}{S} : \frac{13}{19} :: \frac{K}{J} : ?$

- (a) $\frac{10}{11}$ (b) $\frac{11}{10}$
 (c) $\frac{14}{20}$ (d) $\frac{22}{21}$
 (e) $\frac{11}{15}$

Sol. (b) $\frac{M}{S} : \frac{13}{19}$

Here, we observe that the right side number is the position of the corresponding left side letter in the alphabet.

Similarly,

$$\frac{K}{J} : \frac{11}{10}$$

Thus, $? \Rightarrow \frac{11}{10}$

SOLVED EXAMPLES

EXAMPLE ▶ 1: '8' is related to '16P' and '6' is related to '12L' in the same way as '11' is related to

- (a) 22R (b) 22K
 (c) 22J (d) 22S
 (e) None of these

Sol. (e) $8 \times 2 = 16$ and P is at 16th place in English alphabet.

$6 \times 2 = 12$ and L is at 12th place in English alphabet.

Thus, 11 is related to 22V

(V is at 22nd place in English alphabet)

Since '+' relation does not exist for any options, therefore '-' relation should be checked.

EXAMPLE ▶ 2 : If 'IN' is written as 'KQ' then what will be written as 'FR' ?

- (a) EO (b) DO
 (c) DP (d) EP
 (e) None of these

Sol. (b) $I \xrightarrow{+2} K$

$$N \xrightarrow{+3} Q$$

Thus, $F \xrightarrow{-2} D$

$$R \xrightarrow{-3} O$$

EXAMPLE ▶ 3 : 'Picture' is related to 'See' in the same way as 'Book' is related to

- (a) Listen (b) Read
 (c) Buy (d) Box
 (e) None of these

Sol. (b) As picture is used to see, similarly book is used to read.

EXAMPLE ▶ 4 : Which of the following pairs have the same relationship as SLAPSTICK : LAUGHTER ?

- (a) fallacy : dismay
 (b) genre : mystery
 (c) satire : anger
 (d) mimicry : tears
 (e) horror : fear

Sol. (e) Slapstick which means comedy results in laughter; horror results in fear.

EXAMPLE ▶ 5 : Which of the following pairs have the same relationship as

SPY : CLANDESTINE ?

- (a) accountant : meticulous
 (b) furrier : rambunctious
 (c) lawyer : ironic
 (d) shepherd : garrulous
 (e) astronaut : opulent

Sol. (a) A spy acts in a clandestine which means in a hidden manner; an accountant acts in a meticulous manner.

EXAMPLE ▶ 6 : 'Gram' is related to 'weight' in the same way as 'centimetre' is related to...?.....

- (a) Area (b) Volume
 (c) Length (d) Sound
 (e) Frequency

Sol. (c) As gram is the unit of weight, similarly centimetre is the unit of length

EXERCISE

1. ACF is related to GIL in the same way as CEH is related to...?.....
 (a) ILN (b) IKN
 (c) IKM (d) ILM
 (e) None of these
2. 12 is related to 15 in the same way as 15 is related to...?.....
 (a) 24 (b) 21
 (c) 18 (d) 16
 (e) None of these
3. 'Footwear' is related to 'Cobbler' in the same way as 'Furniture' is related to
 (a) Mason (b) Goldsmith
 (c) Carpenter (d) Potter
 (e) None of these
4. 'BEAN' is related to 'NEAB' and 'SAID' is related to 'DAIS' in the same way as 'LIME' is related to
 (a) MLEI (b) ELMI
 (c) FIML (d) EILM
 (e) None of these
5. Which of the following pairs have the same relationship as OFTEN: FOTNE?
 (a) HEART: TRAHE (b) OPENS: SNEOP
 (c) ROSLU: IRSYK (d) FIRST: IFRST
 (e) RISKY: IRSYK
6. 'Army' is related to 'Soldier' in the same way as 'School' is related to which of the following?
 (a) Peon (b) Principal
 (c) Class (d) Watchman
 (e) Student
7. 'Radish' is related to 'Root' in the same way as 'Rose' is related to...?.....
 (a) Garden (b) Fragrance
 (c) Thorn (d) Flower
 (e) None of these
8. 'Captain' is related to 'Team' in the same way as 'Director' is related to which of the following?
 (a) Supervisor (b) Employee
 (c) Organisation (d) Union
 (e) Customer
9. Which of the following have the same relationship as HEART: THREA?
 (a) SWORN: NSOWR (b) FUNDS: FSDUN
 (c) GLAZE: EGZAL (d) LOWER: RLEWO
 (e) None of these
10. JM: LO:: GJ: ?
 (a) HK (b) HL
 (c) IL (d) IK
 (e) None of these
11. Which of the following indicates similar relationship as CASE' has with 'EASC' ?
 (a) PICK: KIPC (b) JAIL: IJLA
 (c) DOME: MOED (d) PILE: EPLI
 (e) None of these
12. An 'Island' is related to 'Sea' in the same way as an 'Oasis' is related to ...?.....
 (a) Water (b) Illusion
 (c) Pond (d) Trees
 (e) Desert
13. 'Mustard' is related to 'seeds' in the same way as 'carrot' is related to...?.....
 (a) Fruits (b) Stems
 (c) Flowers (d) Roots
 (e) None of these
14. 'FI' is related to 'LO' in the same way as 'PS' is related to...?.....
 (a) VY (b) VZ
 (c) WZ (d) UX
 (e) None of these
15. Which of the following pairs have the same relationship as UMBRAGE: OFFENSE ?
 (a) confusion: penance
 (b) infinity: meaning
 (c) decorum: decoration
 (d) elation: jubiliace
 (e) outrage: consideration
16. Which of the following pairs have the same relationship as DOMINANCE: HEGEMONY ?
 (a) romance: sympathy
 (b) furtherance: melancholy
 (c) independence: autonomy
 (d) tolerance: philanthropy
 (e) recompense: hilarity
17. Which of the following pairs have the same relationship as FERAL: TAME ?
 (a) rancid: rational
 (b) repetitive: recurrent
 (c) nettlesome: annoying
 (d) repentant: honorable
 (e) ephemeral: immortal
18. Which of the following pairs have the same relationship as EYRIE: EAGLE ?
 (a) capital: government (b) bridge: architect
 (c) unit: apartment (d) kennel: veterinarian
 (e) house: person

19. Which of the following pairs have the same relationship as DELTOID : MUSCLE ?
- radius : bone
 - brain : nerve
 - tissue : organ
 - blood : vein
 - scalpel : incision
20. Which of the following pairs have the same relationship as CONVICTION : INCARCERATION ?
- reduction : diminution
 - induction : amelioration
 - radicalization : estimation
 - marginalization : intimidation
 - proliferation : alliteration
21. Which of the following pairs have the same relationship as INTEREST : OBSESSION ?
- mood : feeling
 - weeping : sadness
 - dream : fantasy
 - plan : negation
 - highlight : indication
22. Which of the following pairs have the same relationship as FROND : PALM ?
- quill : porcupine
 - blade : evergreen
 - scale : wallaby
 - tusk : alligator
 - blade : fern
23. Which of the following pairs have the same relationship as EXPLORE : DISCOVER ?
- read : skim
 - research : learn
 - write : print
 - think : relate
 - sleep : wake
24. Which of the following pairs have the same relationship as FINCH : BIRD ?
- frog : toad
 - elephant : reptile
 - Dalmatian : dog
 - collie : marsupial
 - ant : ladybug
25. Which of the following pairs have the same relationship as DIVISION : SECTION ?
- layer : tier
 - tether : bundle
 - chapter : verse
 - riser : stage
 - dais : speaker
26. Which of the following pairs have the same relationship as BRISTLE : BRUSH ?
- arm : leg
 - stage : curtain
 - recline : chair
 - key : piano
 - art : sculpture
27. Which of the following pairs of words have the same relationship as FAN : HEAT ?
- Water : Drink
 - Light : Night
 - Teach : Student
 - Air : Breathe
 - Food : Hunger
28. 'Bihar' is related to 'India' in the same way as 'Florida' is related to.....?.....
- Canada
 - mexico
 - North America
 - USA
 - None of these
29. 'Forfeit' is related to 'Surrender' in the same way as 'Desist' is related to.....?.....
- Perceive
 - Confiscate
 - Exempt
 - Refrain
 - None of these
30. Which one of the following will come at the place of question mark (?)
- $$25 : 630 :: 10 : ?$$
- 105
 - 47
 - 18
 - 27
 - None of these
31. 'Offhand' is related to 'premeditation' in the same way as 'above board' is related to.....?.....
- Integrity
 - Honesty
 - Guide
 - Competition
 - None of these
32. 'Neck' is related to 'Tie' in the same way as 'Waist' is related to.....?.....
- Watch
 - Belt
 - Ribbon
 - Shirt
 - None of these
33. Which one of the following is related to : Clutch : Brake : Horn
- Stand
 - Steering
 - Car
 - Accident
 - None of these

ANSWER KEY									
1	(b)	8	(c)	15	(d)	22	(a)	29	(d)
2	(b)	9	(e)	16	(c)	23	(b)	30	(a)
3	(c)	10	(c)	17	(e)	24	(c)	31	(e)
4	(e)	11	(e)	18	(e)	25	(a)	32	(b)
5	(e)	12	(e)	19	(a)	26	(d)	33	(c)
6	(e)	13	(d)	20	(a)	27	(e)		
7	(d)	14	(a)	21	(c)	28	(d)		

ANSWERS & EXPLANATIONS

1. (b) As $A \xrightarrow{+6} G$ similarly, $C \xrightarrow{+6} I$
 $C \xrightarrow{+6} I$ $E \xrightarrow{+6} K$
 $F \xrightarrow{+6} L$ $H \xrightarrow{+6} N$
 Hence required answer = IKN
2. (b) $12 + (1 + 2) = 15$ (digits of the numbers are added to the number itself)
 $15 + (1 + 5) = 21$
3. (c) Footwear is prepared by a cobbler in the same way as furniture is prepared by a carpenter.
4. (e) EIML (places of first and last letter are interchanged).
5. (e) $\begin{matrix} 1 & 2 & 3 & 4 & 5 & & 2 & 1 & 3 & 5 & 4 \\ O & F & T & E & N & \rightarrow & F & O & T & N & E \\ 1 & 2 & 3 & 4 & 5 & & 2 & 1 & 3 & 5 & 4 \\ R & I & S & K & Y & \rightarrow & I & R & S & Y & K \end{matrix}$
6. (e) 'Army' is an organized military force related to 'soldier' in the same way as school is related to students.
7. (d) Radish to root, rose is flower.
8. (c) As captain is the head of the team, similarly director is the head of the organisation.
9. (e) None of the options matches the changes :
 $\begin{matrix} 1 & 2 & 3 & 4 & 5 & & 5 & 1 & 4 & 2 & 3 \\ H & E & A & R & T & \rightarrow & T & H & R & E & A \\ 1 & 2 & 3 & 4 & 5 & & 5 & 1 & 4 & 3 & 2 \\ L & O & W & E & R & \rightarrow & R & L & E & W & O \end{matrix}$
10. (c) As,
 $J \xrightarrow{+2} L, M \xrightarrow{+2} O$
 similarly,
 $G \xrightarrow{+2} I, J \xrightarrow{+2} L$
11. (e) None of the options matches the changes :
 $C \ A \ S \ E \rightarrow E \ A \ S \ C$
 $1 \ 2 \ 3 \ 4 \quad \quad \quad 4 \ 2 \ 3 \ 1$
12. (e) An island is located in the sea in the same way as an oasis is located in the desert.
13. (d) 'Mustard' is 'seeds' in the same way as 'carrot' is Roots.
14. (a) As $F \xrightarrow{+6} L$
 $I \xrightarrow{+6} O$
 similarly, $P \xrightarrow{+6} V$
 $S \xrightarrow{+6} Y$
15. (d) Umbrage and offense are synonyms; elation and jubilation are synonyms.
16. (c) Hegemony means dominance; autonomy means independence.
17. (e) Feral and tame are antonyms; ephemeral and immortal are antonyms.
18. (e) An eyrie is where an eagle lives; a house is where a person lives.
19. (a) The deltoid is a muscle; the radius is a bone.
20. (a) A conviction results in incarceration; a reduction results in diminution.
21. (c) Obsession is a greater degree of interest; fantasy is a greater degree of a dream.
22. (a) A palm (tree) has fronds; a porcupine has quills.
23. (b) One explores to discover; one researches to learn.
24. (c) A finch is a type of bird; a Dalmatian is a type of dog.
25. (a) Division and section are synonyms; layer and tier are synonyms.

26. (d) A bristle is a part of a brush; a key is a part of a piano.
27. (e) As fan dispels heat, similarly food dispels hunger.
28. (d) As Bihar is a state of India similarly Florida is a state of USA.
29. (d) The words in each pair are synonyms.
30. (a) $(25 \times 25) + 5 = 630$
 $(10 \times 10) + 5 = 105$.
31. (e) 'Offhand' means opposite of 'premeditation.' 'above board' has the opposite sense of none of the choices.
32. (b) As 'Tie' is worn in neck similarly 'belt' is worn in waist.
33. (c) all three items are the parts of a car.



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CLASSIFICATION

CHAPTER 2

CLASSIFICATION

Classification is a process of grouping various objects on the basis of their common properties. Classification, therefore, helps to make a homogeneous group from heterogeneous items. Questions on classification can be asked in any of the following form.

Types of Questions

► Type I Word Classification :

In this type of classification, different objects are classified on the basis of common features / properties - names, places, uses, situations, origin, etc.

ILLUSTRATION ► 1 : Four of the following five are alike in a certain way and so form a group. Which is the one that does not belong to that group?

- (a) Work : Leisure
- (b) Day : Night
- (c) Expediate : Procrastinate
- (d) Frequently : Always
- (e) Happy : Unhappy

Sol. (d) All others are the antonyms of each other.

ILLUSTRATION ► 2 : Four of the following five are alike in a certain way and so form a group. Which is the one that does not belong to that group?

- (a) March
- (b) January
- (c) July
- (d) June
- (e) May

Sol. (d) All other months have 31 days.

► Type II Alphabet Classification :

In this type, alphabets are classified in a group using a particular method or rule.

Rules or methods used for such classification are often simple and hence can easily be understood.

ILLUSTRATION ► 3 : Four of the following five - are alike in a certain way and so form a group. Which is the one that does not belong to that group?

- (a) BY
- (b) LO
- (c) EW
- (d) GT
- (e) HS

Sol. (c) All others letter pairs are in exactly opposite positions in the alphabet of each other. i.e. is B is the 11th alphabet from start, then y is the second alphabet from the end.

► Type III Number Classification

In this type, numbers are classified in a group using a particular method or rule. Rules or methods used for such classification may be based on mathematical operations.

ILLUSTRATION ► 4 : Four of the following five are alike in a certain way and so form a group. Which is the one that does not belong to that group?

- (a) 25—5
- (b) 16—4
- (c) 144—12
- (d) 64—7
- (e) 36—6

Sol. (d) In all other number pairs, the first number is the square of the second number.

$$25 \leftarrow 5^2, 16 \leftarrow 4^2, 144 \leftarrow 12^2, \boxed{64 \leftarrow 7},$$

$$36 \leftarrow 6^2$$

ILLUSTRATION ▶ 5 : Four of the following five are alike in a certain way and so form a group. Which is the one that does not belong to that group?

- (a) 28 (b) 42
 (c) 35 (d) 21
 (e) 65

Sol. (e) All other numbers are divisible by 7 while 65 is not divisible by 7.

▶ **Type IV** Number and Letter Classification

ILLUSTRATION ▶ 6 : Four of the following five are alike in a certain way and so form a group. Which is the one that does not belong to that group?

- (a) 25—E (b) 16—D
 (c) 144—L (d) 64—G
 (e) 36—F

Sol. (d) In all other number-letter pairs, the first number is the square of the position of the second number.

$$25 \leftarrow (E=) 5^2,$$

$$16 \leftarrow (D=) 4^2,$$

$$144 \leftarrow (L=) 12^2,$$

$$64 \leftarrow (H=) 8^2,$$

$$36 \leftarrow (F=) 6^2$$

▶ **Type V** Miscellaneous Classification

In this type of classification, any rule other than those described above can be used for classification or grouping. Questions on such patterns do not necessarily use alphabets and words.

ILLUSTRATION ▶ 7 : In each of the following five options each has a combination of three words forming a group except one. Which option does not belong to here?

- (a) Driver, passenger, vehicle
 (b) Chair, table, bench
 (c) Ship, passenger, captain
 (d) Pilot, Passenger, Plane
 (e) Driver, Passenger, train

Sol. (b) Chair, table and bench belong to a category of furniture.

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SOLVED EXAMPLES

EXAMPLE 1: Four of the following five are alike in a certain way and so form a group. Which is the one that does not belong to the group?

- (a) Jowar (b) Paddy
(c) Millet (d) Wheat
(e) Sesame

Sol. (e) All others are foodgrains while sesame is a condiment.

EXAMPLE 2: Four of the following five are alike in a certain way and so form a group. Which is the one that does not belong to the group?

- (a) 50 (b) 65
(c) 170 (d) 255
(e) 290

Sol. (d) All other numbers except 255 are one more than a square.

$$50 = (7)^2 + 1, 65 = (8)^2 + 1;$$

$$170 = (13)^2 + 1, 290 = (17)^2 + 1$$

$$\text{But } 255 = (16)^2 - 1$$

EXAMPLE 3: Four of the following five are alike in a certain way on the basis of their positions in the English alphabet and so form a group. Which is the one that does not belong to the group?

- (a) HJG (b) PQN
(c) DEB (d) TUR
(e) KLI

Sol. (a) $H \xrightarrow{+2} J \xrightarrow{-3} G$

$$P \xrightarrow{+1} Q \xrightarrow{-3} N$$

$$D \xrightarrow{+1} E \xrightarrow{-3} B$$

$$T \xrightarrow{+1} U \xrightarrow{-3} R$$

$$K \xrightarrow{+1} L \xrightarrow{-3} I$$

EXAMPLE 4: Four of the following five are alike in a certain way. Which is the one that does not belong to the group?

- (a) Talking (b) Thinking
(c) Writing (d) Sitting
(e) Reading

Sol. (b) All others are physical activities.

EXAMPLE 5: Four of the following five are alike in a certain way on the basis of their positions in the English alphabet and hence form a group. Which one does not belong to the group?

- (a) J (b) P
(c) F (d) V
(e) C

Sol. (e) $J \Rightarrow 10; P \Rightarrow 16; F \Rightarrow 6; V \Rightarrow 22; C \Rightarrow 3$

In english alphabet 'C' is in odd place; other letters are all in even places.

EXAMPLE 6: Four of the following five are alike in a certain way based on the position of the letters in the English alphabet and hence form a group. Which one does not belong to the group?

- (a) MOP (b) GIJ
(c) SUV (d) BDE
(e) KLN

Sol. (e) $M \xrightarrow{+2} O \xrightarrow{+1} P$

$$G \xrightarrow{+2} I \xrightarrow{+1} J$$

$$S \xrightarrow{+2} U \xrightarrow{+1} V$$

$$B \xrightarrow{+2} D \xrightarrow{+1} E$$

$$K \xrightarrow{+1} L \xrightarrow{+2} N$$

EXERCISE

DIRECTIONS : In each of the questions given below, four of the five options are alike in a certain way and so form a group. Which option does not belong to the group?

1. (a) 72 (b) 96
(c) 48 (d) 28
(e) 82
2. (a) Table (b) Chair
(c) Cupboard (d) Bed
(e) Computer
3. (a) 119 (b) 123
(c) 143 (d) 133
(e) 149
4. (a) Apple (b) Papaya
(c) Litchi (d) Guava
(e) Orange
5. (a) NEERG (b) DER
(c) KNIP (d) DLEIF
(e) EULB
6. (a) Red (b) Pink
(c) Green (d) Violet
(e) Yellow
7. (a) Kitten (b) Goat
(c) Calf (d) Foal
(e) Lamb
8. (a) Bucket (b) Tap
(c) Bottle (d) Glass
(e) Pitcher
9. (a) Bat (b) Spider
(c) Mosquito (d) Butterfly
(e) Cockroach
10. (a) Hill (b) Valley
(c) Dam (d) River
(e) Mountain
11. (a) Rose (b) Jasmine
(c) Hibiscus (d) Marigold
(e) Lotus
12. (a) Desk (b) Blackboard
(c) Classroom (d) Bench
(e) Chalk
13. (a) June (b) August
(c) December (d) January
(e) October
14. (a) 25 (b) 9
(c) 8 (d) 16
(e) 4
15. (a) Father (b) Aunt
(c) Mother (d) Uncle
(e) Niece
16. (a) Pineapple (b) Guava
(c) Grapes (d) Papaya
(e) Pear
17. (a) FH (b) KM
(c) PR (d) CE
(e) JM
18. (a) 17 (b) 19
(c) 23 (d) 29
(e) 27
19. (a) Parent (b) Child
(c) Uncle (d) Cousin
(e) Relation
20. (a) Shirt (b) Trousers
(c) Frock (d) Skirt
(e) Cloth
21. (a) Picture (b) Painting
(c) Sketch (d) Drawing
(e) Paint
22. (a) UX (b) BE
(c) GJ (d) KO
(e) NQ
23. (a) 48 (b) 24
(c) 15 (d) 35
(e) 65
24. (a) Radish (b) Ginger
(c) Turmeric (d) Potato
(e) Cabbage
25. (a) Sand (b) Cement
(c) Building (d) Wood
(e) Bricks
26. (a) Cricket (b) Volleyball
(c) Chess (d) Tennis
(e) Badminton

27. (a) Dogs (b) Cats (c) Goats (d) Giraffes (e) Cows
28. (a) Paragraph (b) Sentence (c) Page (d) Word (e) Letter
29. (a) Sweet (b) Cake (c) Pastry (d) Bread (e) Biscuit
30. (a) 115 (b) 161 (c) 253 (d) 391 (e) 345
31. (a) OMQ (b) HFJ (c) TPR (d) TRV (e) VTX
32. (a) Gold (b) Nickel (c) Platinum (d) Tungsten (e) Diamond
33. (a) M (b) S (c) U (d) Q (e) D
34. (a) NPQ (b) HJK (c) TVW (d) CEF (e) LMO
35. (a) GIJK (b) DFGH (c) CEFG (d) ABCD (e) JLMN
36. (a) UMRSME (b) EIWNTR (c) PIGRSN (d) LCUOD (e) INYAR
37. (a) Birds (b) Fish (c) Aeroplane (d) Kite (e) Butterfly
38. (a) - (b) + (c) @ (d) = (e) <
39. (a) Salt (b) Black pepper (c) Chilli (d) Coriander (e) Cumin
40. (a) Mica (b) Zinc (c) Iron (d) Chlorine (e) Aluminium
41. (a) 63 (b) 84 (c) 91 (d) 98 (e) 65
42. (a) 39 (b) 27 (c) 48 (d) 42 (e) 24

ANSWER KEY

1	(e)	10	(c)	19	(e)	28	(c)	37	(b)
2	(e)	11	(e)	20	(e)	29	(a)	38	(c)
3	(e)	12	(c)	21	(e)	30	(e)	39	(a)
4	(c)	13	(a)	22	(d)	31	(c)	40	(d)
5	(d)	14	(c)	23	(e)	32	(e)	41	(e)
6	(b)	15	(e)	24	(e)	33	(e)	42	(b)
7	(b)	16	(c)	25	(c)	34	(e)		
8	(b)	17	(e)	26	(c)	35	(d)		
9	(a)	18	(e)	27	(d)	36	(d)		

ANSWERS & EXPLANATIONS

1. (e) All other numbers are multiple of 4 except 82.
2. (e) All other are items of furniture except computer. Computer is an electronic device.
3. (e) All numbers are composite numbers except 149, which is a prime number.
4. (c) All fruits have multiple seeds in the fruit, whereas litchi has only one.
5. (d) All others are the names of colours in reverse order.
NEERG → GREEN
DER → RED
KNIP → PINK
EULB → BLUE
6. (b) All are colours of rainbow except pink.
7. (b) All are young ones of animals except goat.
8. (b) All are used to collect water except tap.
9. (a) All are insects except bat, which is a mammal.
10. (c) All are natural features except dam.
11. (e) Only lotus grows in water.
12. (c) All others are the part of classroom.
13. (a) All other months have 31 days except June.
14. (c) All numbers are the square of other numbers except 8.
15. (e) All are members of one generation above except niece.
16. (c) Only grapes grow in a bunch.
17. (e) $F \xrightarrow{+2} H; K \xrightarrow{+2} M; P \xrightarrow{+2} R;$
 $C \xrightarrow{+2} E; J \xrightarrow{+3} M$
18. (e) All numbers are prime numbers except 27.
19. (e) All others show the relations.
20. (e) Frock, Skirt, Trousers, Shirt are readymade which are prepared from cloth.
21. (e) Picture, Painting, Sketch, Drawing are the result, whereas paint is a material used for such kind of activities.
22. (d) $\begin{array}{ccccc} \text{U} & \text{X} & \text{B} & \text{E} & \text{G} & \text{J} & \text{K} & \text{O} & \text{N} & \text{Q} \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +3 & +3 & +3 & +3 & +3 & +3 & +4 & +3 & +3 & +3 \end{array}$
23. (e) $48 = (7)^2 - 1, 15 = (4)^2 - 1$
 $24 = (5)^2 - 1, 35 = (6)^2 - 1$
But, $65 = (8)^2 + 1$
24. (e) All others grow under the ground whereas cabbage grows above the ground.
25. (c) All others are used to make a building.
26. (c) All others are out-door games but chess is an indoor-game.
27. (d) All others are pet animals.
28. (c) All others are parts of a page.
29. (a) All others are prepared by baking.
30. (e) All others are not divisible by 3 whereas 345 is divisible by 3.
31. (c) In all, the first letter is two places after the second letter in the alphabet, whereas in choice (c) the first letter is four places after the second letter in the alphabet.
32. (e) All others are metals whereas diamond is a non-metal.
33. (e) $M \Rightarrow 13; S \Rightarrow 19; Q \Rightarrow 17; U \Rightarrow 21; D \Rightarrow 4$
D is at even place in the english alphabet.
34. (e) $N \xrightarrow{+2} P \xrightarrow{+1} Q$
 $H \xrightarrow{+2} J \xrightarrow{+1} K$
 $T \xrightarrow{+2} V \xrightarrow{+1} W$
 $C \xrightarrow{+2} E \xrightarrow{+1} F$
 $L \xrightarrow{+1} M \xrightarrow{+2} O$
35. (d) One letter is skipped between first two letters except ABCD.
36. (d) (a) Summer (b) Winter (c) Spring and (e) Rainy are the names of seasons.
37. (b) All others can fly in sky except fish.
38. (c) Others denote mathematical operations.
39. (a) All are spices except salt.
40. (d) All are solid whereas chlorine is a gas
41. (e) All are divisible by 7 except 65.
42. (b) All others are not cube numbers.



CODING-DECODING

CHAPTER 3

CODING-DECODING

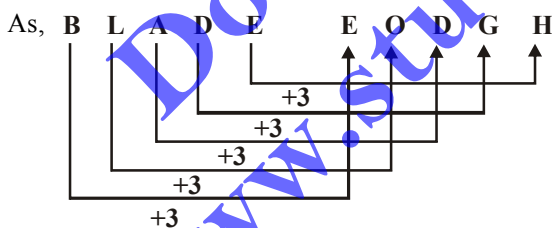
A code is a method of sending a secret message between two parties that cannot be deciphered by a third party. However Coding is done according to a certain pattern in the mind of the sender. Therefore, its meaning can be deciphered by a third person, only if he carefully studies this pattern. This process is called 'Decoding'. You will be required to find a word by analysing the given code or forming the code for a new word.

Following are the general patterns for coding - Decoding-

- Words could be written in reverse order.
- $\pm 1, \pm 2, \pm 3, \dots$ should be considered while decoding. So $+1$, means that B would be written in place of A and so on, -1 means A would be written in place of B and so on.
- Sometimes, a successive increasing or decreasing pattern can also be followed, i.e., first alphabet would be replaced by $+1$, Second alphabet by $+2$ and so on.
- Oscillation pattern can also be followed, i.e. first alphabet would be replaced by $+1$, second alphabet would be replaced by -1 and so on.
- Also, sometime the given code contains all the alphabets for the one given in question. In such a situation corresponding codes should be replaced to arrive at the answer.

ILLUSTRATION 1: If EODGH is the code for BLADE, what is the code for CRICKET?

Sol. FULFNHW



Similarly,

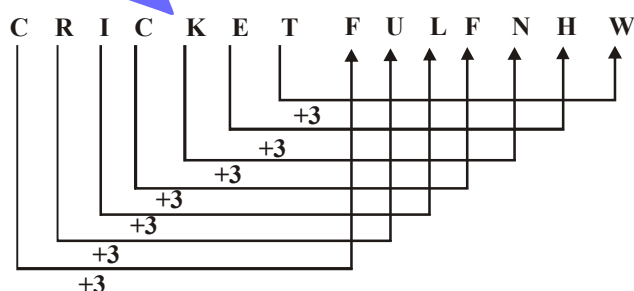


ILLUSTRATION 2: If EARTH is coded as 41590 and PALE as 2134, what is the code for PEARL?

Sol. 24153

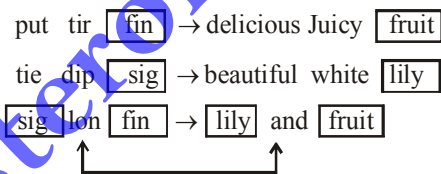
codes for letters are: P=2, E=4, A=1, R=5 and L=3

ILLUSTRATION 3: In a certain language, 'put tir fin' means 'delicious juicy fruit'; 'tie dip sig' means 'beautiful white lily', and 'sig lon fin' means 'lily and fruit'. What is the code for 'and'?

Sol. 'lon'

Common code from first and third statement for 'fin' is 'fruit'.

From second and third statement, 'sig' is 'lily'. So 'lon' means 'and' in third statement.



Types of Questions

Type I Letter Coding

In such questions, code values are assigned to a word in terms of the alphabets. There are the following types of letter coding.

ILLUSTRATION 4: The word MAN is coded as NBO. What should be the code for SKY?

Sol.

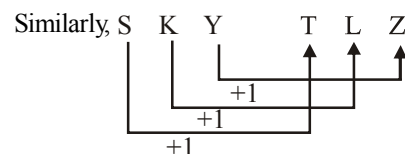
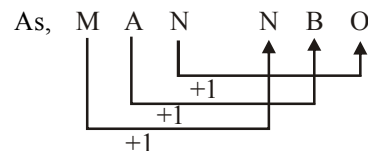


ILLUSTRATION 5: In a secret way of writing 'GANDHI WAS A GREAT LEADER OF INDIA' is written as 'RUFZOJ SUVU RDTUB QTUZZD EP JFZJU'. Keeping this in mind, pick the code for each word given below from the choices given:

1. STRONG

- | | |
|------------|------------|
| (a) VBDERE | (b) VBDEER |
| (c) VBEDFR | (d) VBDEFR |

2. ISLAND

- (a) JVQUFZ (b) ZFUQVJ
 (c) QUFZJV (d) FUZJVQ

Sol. Here each letter of the original sentence is coded from different letter in a code as shown below:

Sentence	GANDHI	WAS	A	GREAT	LEADER	OF	INDIA
Code	RUFZOJ	SUV	U	RDTUB	QTUZTD	EP	JFZJU

Hence, code for STRONG is VBDEFR Option (d) in 1
 And code for ISLAND is JVQUFZ Option (a) in 2

► **Type II Letter and Number Coding**

In these questions either numerical values are assigned to a word or alphabetical code values are assigned to the numbers. The candidate is required to analyse the code according to the directions.

ILLUSTRATION ► 6: In a given code SISTER is coded as 535301. UNCLE as 84670 and BOY as 129. How is RUSTIC written in that code?

- (a) 633185 (b) 185336
 (c) 363815 (d) 581363

Sol. In this code the alphabets are coded as follows

SISTER UNCLE BOY
 5 3 5 3 0 1 8 4 6 7 0 1 2 9

If we apply this method, the code comes out to be 185336

► **Type III Coding by Using Position Numbers in the Alphabet**

We represent the alphabet and assign numbers to the letters as follows:

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

For remembering the position of the alphabets—
 D H L P T X Code should be kept in mind where
 4 8 12 16 20 24 alphabets are positioned
 at multiples of 4

ILLUSTRATION ► 7: If 'word' is coded as 2315184 then how will 'simple' be coded as?

Take the following options

- (a) 199237612 (b) 1991316125
 (c) 21237643 (d) 22145783

Sol. Here we observe that 'W' has been replaced by its position code that is by 23. Similarly 'Q' has been replaced by 15 therefore the word 'SIMPLE' will be coded as S - 19, I - 9, M - 13, P - 16, L - 12, E - 5
 Hence required will be code 1991316125

► **Type IV Coding by substitution**

In substitution coding some particular objects are assigned as code names and then a question is asked that is to be answered in the code language.

ILLUSTRATION ► 8: If wall is called window, window is called door, door is called floor, floor is called roof and roof is called ventilator, what will a person stand on?

- (a) door (b) ventilator
 (c) Roof (d) Floor

Sol. A person stands on the floor and in the given code language, floor is called roof.
 Hence, roof will be the correct answer.

► **Type V Coding by Combinations of Letters, Numbers and/ or Symbols**

Directions (Examples 9-13) : In each question below is given a group of digits followed by four combinations of letters or symbols numbered (a), (b), (c) and (d). You have to find out which of the combinations correctly represents the group of digits based on the coding system and the conditions given below and mark the number of that combination as your answer. If none of the combinations correctly represents the group of digits, mark (e), i.e., 'None of these' as your answer.

Digit	5	1	3	4	9	6	8	2	7
Symbol	P	A	K	%	R	@	D	©	M

Conditions:

- (i) If the first digit is odd and the last digit is even, the codes for the first and last digits are to be interchanged.
 (ii) If both the first and the last digits are even, both are to be coded as ★
 (iii) If both the first and the last digits are odd, both are to be coded as \$.

ILLUSTRATION ► 9: What is the code of 215349?

- (a) RAPK%© (b) ★APK%\$
 (c) \$APK%\$ (d) ©PAK%R
 (e) None of these

Sol. (e) 2 1 5 3 4 9
 ↓ ↓ ↓ ↓ ↓ ↓
 © A P K % R

ILLUSTRATION ► 10: What is the code of 671254?

- (a) @MA©P% (b) SMA©PS
 (c) ★MA©P★ (d) %MA©P©
 (e) None of these

Sol. (c) 6 7 1 2 5 4
 ↓ ↓ ↓ ↓ ↓ ↓
 ★ M A © P ★
 Condition (ii) is applied

ILLUSTRATION ► 11: What is the code of 813469?

- (a) RAK%@D (b) DAK%@R
 (c) DAP%@R (d) ★AK%@★
 (e) None of these

Sol. (b) 8 1 3 4 6 9
 ↓ ↓ ↓ ↓ ↓ ↓
 D A K % @ R

ILLUSTRATION ► 12: What is the code of 794821?

- (a) MR%D©A (b) AR%D©M
 (c) M%RD©R (d) \$R%D©\$
 (e) None of these

Sol. (d) 7 9 4 8 2 1
 ↓ ↓ ↓ ↓ ↓ ↓
 \$ R % D © \$
 Condition (iii) is applied

ILLUSTRATION ► 13: What is the code of 591426?

- (a) @RA%©P (b) PRA%©@
 (c) @AR%©P (d) \$RA%©★
 (e) None of these

Sol. (a) 5 9 1 4 2 6
 ↓ ↓ ↓ ↓ ↓ ↓
 @ R A % © P
 Condition (i) is applied

SOLVED EXAMPLES

EXAMPLE 1: In a certain code language FIVE is written as GHWD. How is HURT written in the same code language?

- (a) ITSS (b) ITST
(c) GTSS (d) ITQU
(e) None of these

Sol. (a) As, F I V E
 $\downarrow +1 \downarrow -1 \downarrow +1 \downarrow -1$
 G H W D
 Similarly, H U R T
 $\downarrow +1 \downarrow -1 \downarrow +1 \downarrow -1$
 I T S S

EXAMPLE 2: In a certain code language 'La Ke Ta' means 'go and swim' and 'Ne La Se' means 'you swim here' and 'Pe Ke Ne Ta' means 'he and you go'. Which of the following is the code for 'here' in that code language?

- (a) Cannot be determined
(b) La
(c) Ne
(d) Se
(e) None of these

Sol. (d) $\boxed{\text{La}}$ Ke Ta \rightarrow go and $\boxed{\text{swim}}$

$\boxed{\text{Ne}}$ $\boxed{\text{La}}$ Se \rightarrow $\boxed{\text{you}}$ $\boxed{\text{swim}}$ here

Pe ke $\boxed{\text{Ne}}$ Ta \rightarrow he and $\boxed{\text{you}}$ go

Hence, the code for 'here' is 'Se'

EXAMPLE 3: In a certain code ROBE is written as 5136 and BIND is written as 3792. How is RIDE written in that code?

- (a) 5276 (b) 5726
(c) 5376 (d) 5326
(e) None of these

Sol. (b) R O B E and B I N D
 $\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow$
 5 1 3 6 3 7 9 2

Similarly,

R I D E
 $\downarrow \downarrow \downarrow \downarrow$
 5 7 2 6

EXAMPLE 4: If 'spoon' is called 'plate' 'plate' is called 'knife', 'knife' is called 'jug', 'jug' is called 'glass', 'glass' is called 'saucer' and 'saucer' is called 'spoon', by what do we cut fruit?

- (a) spoon (b) jug
(c) glass (d) saucer
(e) None of these

Sol. (b) We cut fruit with knife and knife is called jug, hence correct answer is jug.

EXAMPLE 5: If 'A' is substituted by 26, 'B' by 25 and so on upto 'Z' which is substituted by 1, what will be the sum of the numbers substituted for the word 'WAXY'?

- (a) 33 (b) 35
(c) 37 (d) 73
(e) None of these

Sol. (b) W A X Y
 $\downarrow \downarrow \downarrow \downarrow$
 4 + 26 + 3 + 2 = 35

EXAMPLE 6: In a certain code BOARD is written as 54#12 and MORE is written as 941\$. How is DREAM written in that code?

- (a) 21\$#9 (b) 2\$1#9
(c) 51\$#9 (d) 25\$#9
(e) None of these

Sol. (a) B O A R D and M O R E
 $\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow$
 5 4 # 1 2 9 4 1 \$

Hence,

D R E A M
 $\downarrow \downarrow \downarrow \downarrow \downarrow$
 2 1 \$ # 9

EXAMPLE 7: If E is coded as V, D is coded as Q, N is coded as Z, G is coded as T, R is coded as I and A is coded as M, which of the following will be the correct form of the word DANGER?

- (a) QMZTIV (b) QMZTVI
(c) QMZTIV (d) QZMTVI
(e) None of these

Sol. (b) D A N G E R
 $\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow$
 Q M Z T V I

EXAMPLE 8: If 'A' is substituted by 1, 'B' by 2 and so on upto 'Z' which is substituted by 26, what will be, the sum of the numbers substituted for the word DECAF?

- (a) 38 (b) 41
(c) 40 (d) 37
(e) None of these

Sol. (a) D E C A F
 $\downarrow \downarrow \downarrow \downarrow \downarrow$
 4 + 5 + 3 + 1 + 25 = 38

EXERCISE

1. In a certain code language 'PULSE' is written as 'DRKTO' and 'NEW' is written as 'VDM'. How will 'PROBES' be written in that code language?
 - (a) RDANQO
 - (b) QSPCFT
 - (c) TFCPSQ
 - (d) OPNADR
 - (e) None of these
 2. If REMIT is written as *£3□7 and CONSUL is written as =%8 β \$5; then OCELOT will be written as
 - (a) %=3587
 - (b) %=£5%7
 - (c) %=35%□
 - (d) %35%7
 - (e) None of these
 3. If AMONG is written as NAOGM and SPINE is written as NSIEP, then LAMON will be written as
 - (a) OALNM
 - (b) MLONA
 - (c) OLMNA
 - (d) OLNMA
 - (e) None of these
 4. In a certain code RETAIL is written as UFSBJM, how is EXPECT written in that code?
 - (a) FQYFDU
 - (b) QYFIJOF
 - (c) YQFDU
 - (d) QYFFDU
 - (e) None of these
 5. In a certain code SEAL is written as \$75@ and DOSE is written as #8\$7. How is SOLD written in that code?
 - (a) \$8@#
 - (b) #8\$5
 - (c) #8\$7
 - (d) \$5@#
 - (e) None of these
 6. In a certain code BOND is written as 1543 and DEAN is written as 3 864. How is BED written in that code?
 - (a) 153
 - (b) 183
 - (c) 138
 - (d) 143
 - (e) None of these
 7. In a certain code NAMES is written as TFNBO. How is CRANE written in that code?
 - (a) FMBQD
 - (b) D\$BOF
 - (c) FOBSD
 - (d) FBODS
 - (e) None of these
 8. In a certain code 'go home' is written as 'ta na' and 'nice little home' is written as 'na ja pa'. How is 'go' written in that code?
 - (a) ta
 - (b) na
 - (c) ja
 - (d) na or to
 - (e) None of these
 9. In a certain code DAYLONG is written as ZBEKHOP. How is CORDIAL written in that code?
 - (a) SPDCMBJ
 - (b) SPDEMBJ
 - (c) DPSCMBJ
 - (d) SPDCJBM
 - (e) None of these
 10. In a certain code 'good and bad' is written as '725'; 'one and all' is written as '932' and 'this is good' is written as '154'. How is 'one' written in that code?
 - (a) 9
 - (b) 3
 - (c) 2
 - (d) Date inadequate
 - (e) None of these
 11. In a certain code CHANDIGARH is written as DNAHCHRAGI. How is SIKKIM written in that code?
 - (a) TJKJKM
 - (b) TJLLJN
 - (c) MIKKIS
 - (d) KISMIK
 - (e) None of these
 12. In a certain code language 'do re me' means 'he is late', 'fa me la' means 'she is early' and 'so ti do' means 'he leaves soon'. Which word in that language means 'late'?
 - (i) la
 - (b) do
 - (c) me
 - (d) Date inadequate
 - (e) None of these
 13. If 'table' is called 'chair'; 'chair' is called 'cupboard', 'cupboard' is called 'chalk', 'chalk' is called 'book', 'book' is called 'duster' and 'duster' is called 'table', what does the teacher use to write on the black board?
 - (a) book
 - (b) cupboard
 - (c) table
 - (d) duster
 - (e) None of these
 14. In a certain code 'MOTHER' is written as OMHURF. How will 'ANSWER' be written in that code?
 - (a) NBWRRF
 - (b) MAVSPE
 - (c) NBWTRD
 - (d) NBXSSE
 - (e) None of these
 15. In a certain code 'GROW' is written as '=@%#' and 'WITHIN' is written as '# ÷ + ⊙ ÷ Δ'. How is 'WING' written in that code?
 - (a) # ÷ Δ =
 - (b) # % Δ =
 - (c) % ÷ Δ =
 - (d) # ÷ ⊙ =
 - (e) None of these
- Directions (Q. 16-20) :** Below are given letters and their numeric codes. Below that are given some conditions to be followed while codifying the given letter groups in each question. Study them and find out the correct numeric coded form of the given letter group in each question. If none of the coded forms is correct, your answer will be (e) i.e. 'None of these'.
- | | | | | | | | | | |
|--------|---|---|---|---|---|---|---|---|---|
| Digits | 2 | 5 | 7 | 8 | 9 | 4 | 6 | 3 | 1 |
| Code | M | R | T | B | W | K | D | N | J |
- Conditions:**
- (i) If the first and last numbers are odd digits, both are to be coded as I.
 - (ii) If the first and last numbers are even digits, both are to be coded as Y.
16. 726395
 - (a) IMDNWI
 - (b) YMDNWI
 - (c) TMDNWR
 - (d) IMDNWR
 - (e) None of these

17. 263847
 (a) IDNBKI (b) YDNBKY
 (c) IDNBKY (d) MDNBKY
 (e) None of these
18. 591248
 (a) IWJMKB (b) RWJMKY
 (c) YWJMKY (d) RWJMKB
 (e) None of these
19. 615824
 (a) IJRBMI (b) IJRBYM
 (c) YJRBYM (d) IJRBMK
 (e) None of these
20. 831795
 (a) INJTWR (b) BNJTWR
 (c) BNJTWY (d) UNJYWY
 (e) None of these
21. In a certain code DESIGN is written as FCUGIL, how is REPORT written in that code?
 (a) TCRMPR (b) TCRMTR
 (c) TCTMPR (d) TCTNTR
 (e) None of these
22. In a certain code CREAM is written as NBDBQ. How is BREAD written in that code?
 (a) EBFAQ (b) EBDAQ
 (c) BEDQA (d) BEFQA
 (e) None of these
23. In a certain code DUPLICATE is written as MRV FJFVBE. How is CARTOUCHE written in that code?
 (a) UTBEPWDJF (b) UTBFOFJDW
 (c) UTBEQFJDW (d) UTBEFJJDW
 (e) None of these
24. In a certain code RAIL is written as 5796 and TAPE is written as 3748. How is PAIR written in that code?
 (a) 4795 (b) 4785
 (c) 3795 (d) 8795
 (e) None of these
- Directions (Q. 25-31):** In each of these questions, a group of digits is given followed by four combinations of letters and symbols numbered (a), (b), (c) and (d). The group of digits is to be coded as per the scheme and conditions given below. The serial number of the combination which correctly represents the group of digits is your answer. If none of the four combinations is correct, your answer is (e) i.e., 'None of these'.
- | Digits | 5 | 8 | 4 | 3 | 6 | 2 | 9 | 0 | 7 | 1 |
|--------|---|---|----|---|---|---|---|---|---|---|
| Code | T | J | \$ | # | H | Q | @ | L | % | K |
- Conditions:**
- (i) If the first as well as the last digit is odd, both are to be coded as ©.
- (ii) If the first as well as the last digit is even, their codes are to be swapped.
- (iii) If '0' is the last digit, it is to be coded as *.
25. 270514
 (a) ©%LTK© (b) \$%LTKQ
 (c) Q%LTK\$ (d) \$%*TKQ
 (e) None of these
26. 364279
 (a) ©H\$Q%© (b) #H\$Q%
 (c) ©H\$Q%# (d) #H\$Q%©
 (e) None of these
27. 875306
 (a) J%T#L11 (b) H%T#LH
 (c) H%T#LJ (d) J% oT#LJ
 (e) None of these
28. 592476
 (a) HCOQ\$%T (b) Q\$% oT
 (c) H©Q\$%OO (d) CCQ\$%o©
 (e) None of these
29. 468910
 (l) \$HJ©KL (b) LHJ@K\$
 (c) *HJ@K\$ (d) \$HJ@K*
 (e) None of these
30. In a certain code CHITON is written as IHCNOT. How will DILATE be written in that code?
 (a) ETALID (b) LIDATE
 (c) LIETA (d) ETADIL
 (e) None of these
31. In a certain code 'you are' means 'Se Pa', 'see you' means 'La Se' and 'parrots are' means 'Ni Pa'. What does 'see parrots' mean in that code language?
 (a) Cannot be determined
 (b) La Ni
 (c) Se Ni
 (d) La Pa
 (e) None of these
32. In a certain code, MIGHT is written as LHFSG. How is BELOW written in that code?
 (a) CFMPX (b) ADJNU
 (c) ADKMV (d) ADKNV
 (e) None of these
33. If 'DO' is written as 'FQ' and 'IN' is written as 'KP' then how would 'AT' be written?
 (a) CV (b) BS
 (c) CU (d) DV
 (e) None of these
34. If 8 is written as B, 1 as R, 6 as K, 9 as O, 4 as M, 7 as W and 3 as T, then how, would WROMBT be Written in the numeric form?
 (a) 714983 (b) 719483
 (c) 769483 (d) 719486
 (e) None of these F
35. In a code language, PINK is written as QHOJ and BOLT is written as CNMS. How would MUST be written in that code?
 (a) NVT\$ (b) NTT\$
 (c) NTRS (d) NITU
 (e) None of these

36. In a certain code ROPE is written as \$3%6 and RITE is written as \$4#6. How is PORT written in that code?
 (a) %4\$# (b) \$3%#
 (c) \$64% (d) %3\$#
 (e) None of these
37. In a certain code HOUSE is written as FTVPI how is CHAIR written in that code?
 (a) DIBJS (b) SBJID
 (c) SHBGD (d) SJBID
 (e) None of these
38. In a certain code COIMBATORE is written as DPJNCBUPSF. How is INDORE written in that code?
 (a) JOENQF (b) JMCPOD
 (c) JOEPSF (d) HMCNQD
 (e) None of these
39. In a certain code language 'in ba pe' means 'he has won', 'le ki ba' means 'she has lost' and 'in se pe' means 'he always won'. Which word in that language means 'he'?
 (a) in (b) pe
 (c) se (d) Data inadequate
 (e) None of these
40. If 1 is coded as \$, 5 is coded as %, 9 is coded as ★, 3 is coded as +, 7 is coded as # and 4 is coded as?, what will be the correct code of the number 435971?
 (a) ?+ % ★ # \$ (b) ?+ % \$ # ★
 (c) ?+ ★ # % \$ (d) \$ # ★ % + ?
 (e) None of these
41. ENIMY
 (a) 1%28 (b) ?732?
 (c) 17328 (d) ?7328
 (e) None of these
42. GENIR
 (a) ?173? (b) 6%39
 (c) 6%79 (d) 61739
 (e) None of these
43. QUERI
 (a) 5%93 (b) ?413?
 (c) ?4139 (d) ?419?
 (e) None of these
44. EINUM
 (a) 1%72 (b) 0%42
 (c) 1374? (d) 13742
 (e) None of these
45. UNGRE
 (a) \$769\$ (b) 4769\$
 (c) 47691 (d) \$7691
 (e) None of these
46. In a certain code BAKE is written as 3792 and BIT is written as 368. How is BITE written in that code?
 (a) 3682 (b) 3768
 (c) 3782 (d) 3672
 (e) None of these
47. In a certain code GROUP is written as OTNQF. How is THEIR written in that code?
 (a) SJFIU (b) QHDGS
 (c) SGDHOQ (d) QJFIS
 (e) None of these
48. In a certain code 'LOCK' is written as 'MPBJ' and 'BLOW' is written as 'CMNV'. How is 'WINE' written in that code?
 (a) VHOE (b) XJMD
 (c) XJOR (d) VHMD
 (e) None of these

Directions (Q. 41-45): Below are given letters and their numeric codes. Below that are given some conditions to be followed while codifying the given letter groups in each question. Study them and find out the correct numeric coded form of the given letter group in each question. If none of the coded form is correct, your answer will be (e) i.e. 'None of these'.

Digit	M	Q	I	N	E	Y	U	G	R
Code	2	5	3	7	1	8	4	6	9

Conditions:

- (i) If the first and last letters are vowels both are to be coded as \$.
- (ii) If the second letter is a vowel and the third letter is a consonant, a single code is to be used and both are to be coded jointly as %.
- (iii) If the first letter is a consonant and the last letter is a vowel, both are to be coded as '?'

41. ENIMY
 (a) 1%28 (b) ?732?
 (c) 17328 (d) ?7328
 (e) None of these
42. GENIR
 (a) ?173? (b) 6%39
 (c) 6%79 (d) 61739
 (e) None of these

Directions (Q49-53) : In each of the questions given below, a group of digits is given followed by four combinations of letters/ symbols numbered (a), (b),(c) and(d). You have to find out which of the four combinations correctly represents the group of digits based on the letter/symbol codes and the conditions given below. If none of the four combinations represents the group of digits correctly, give (e) i.e. 'None of these' as the answer.

Digit	2	8	3	9	4	7	6	5	1
Code	B	=	T	@	K	\$	©	P	C

Conditions:

- (i) If the first digit is odd and last digit is even, the codes for the first and the last digits are to be interchanged.
- (ii) If the first as well as the last digit is even, both are to be coded by the code for last digit.
- (iii) If the first as well as the last digit is odd, both are to be coded as X.
- (iv) If the first digit is even and last digit is odd, both are to be coded by the code for the first-digit.

49. 2976581
 (a) B@\$©P=B (b) C@\$©P=C
 (c) B@\$©P=C (d) C@\$©P=B
 (e) None of these

50. 7269534
 (a) \$BC@PTK (b) KBC@PTS
 (c) \$B@PTS (d) KBC@P=\$
 (e) None of these
51. 8135246
 (a) =CTPBK= (b) ©CTP=K©
 (c) ©CTPBK© (d) CTPB\$=
 (e) None of these
52. 4352718
 (a) XTPB\$CX (b) KTPB\$C=
 (c) =TPB\$CK (d) KTP\$CK
 (e) None of these
53. 9256473
 (a) XBP©K\$T (b) @BP©K\$X
 (c) @BP©K\$T (d) XBP©K\$X
 (e) None of these
54. In a certain code language GONE is written as '5139' and NODAL is written as '31268'. How is LODGE written in that code?
 (a) 81259 (b) 84259
 (c) 82459 (d) 82659
 (e) None of these
55. In a certain code MEADOW is written as BFNVNC. How is CORNER written in that code?
 (a) DPSQDM (b) SPDMDQ
 (c) SPDQDM (d) DPSMDQ
 (e) None of these
56. In a certain code SOLDIER is written as JFSCRNK. How is GENIOUS written in that code?
 (a) PVTHHFO (b) PVTHFDM
 (c) PVTHMDF (d) TVPHFDM
 (e) None of these
57. If blue means green, green means black, black means white, white means pink, pink means red and red means orange, then what is the colour of blood?
 (a) Red (b) Black
 (c) White (d) Pink
 (e) None of these
58. In a certain code language KITE is written as %2\$# and STUD is written as @\$57 How is DESK written in that code?
 (a) 8%©# (b) ©8%#
 (c) #7%@ (d) 7#@%
 (e) None of these

Directions (59-63) : Study the following information to answer the given questions :

In a certain code 'colours of the sky' is written as 'ki la fa so', 'rainbow colours' is written as 'ro ki' and 'sky high rocket' is written as 'la pe jo' and 'the rocket world' is written as 'pe so ne'.

59. Which of the following is the code for 'colours sky high' ?
 (a) ro jo la (b) fa la jo
 (c) la ki so (d) ki jo la
 (e) fa ki jo
60. Which of the following will/may represent 'the' ?
 (a) Only 'fa' (b) Either 'fa' or 'la'
 (c) Only 'so' (d) Only 'la'
 (e) Either 'so' or 'fa'
61. What does 'pe' represent in the code ?
 (a) colours (b) sky
 (c) high (d) rainbow
 (e) rocket
62. How can 'bird of the rainbow sky' be written in this code ?
 (a) fa la tu ki jo (b) fa so pe la ro
 (c) jo fa ro la tu (d) so ro fa tu la
 (e) ki la fa tu ro
63. Which of the following is the code for 'high' ?
 (a) Only 'la' (b) Only 'jo'
 (c) Either 'la' or 'jo' (d) Only 'ro'
 (e) None of these
64. In a certain code language 'bring the white board' is written as 'ka na di pa' and 'white and black board' is written as 'na di sa ra'. How is 'the' written in that code?
 (a) ka (b) pa
 (c) ka or pa (d) Data inadequate
 (e) None of these
65. In a certain coding system, RBM STD BRO PUS means 'the cat is beautiful'. TNH PUS DIM STD means 'the dog is brown'. PUS DIM BRO PUS CUS means 'the dog has the cat'. What is the code for 'has' ?
 (a) CUS (b) BRO
 (c) DIM (d) STD
 (e) None of these
66. If NAXALITE is written in a certain code as LYVYJGRC' how will INTEGRATE be written in the same code ?
 (a) LGRECYPRC (b) GLRCEPYRC
 (c) PYWMNOPQR (d) BLACKHOLE
 (e) None of these

DIRECTIONS (Qs. 67-71) : In each of these questions a group of letters is given followed by four combinations of numbers codes lettered (a), (b), (c) and (d). The group of letters is to be coded with the numbers codes and the condition given below. The serial letter of the number combination, which correctly represents the letter group is your answer.

Letters	D	J	K	Q	H	V	N	E	B	A
Numbers Codes	3	9	7	6	4	8	2	1	5	0

Condition :

If the first or the last letter or both in the letter group is /are a vowel then the same is/are to be coded by symbol #.

67. EHNDJV
 (a) #42389 (b) 142398
 (c) #42398 (d) 14239#
 (e) None of these
68. KQDJNH
 (a) 763942 (b) 736924
 (c) #36924 (d) #63924
 (e) None of these
69. AJNVQE
 (a) #9286# (b) 09286#
 (c) #92861 (d) 092861
 (e) None of these
70. QHJVND
 (a) 648923 (b) 649823
 (c) #49823 (d) 64892#
 (e) None of these
71. JKEDHA
 (a) 97#34# (b) 971340
 (c) 971430 (d) 97134#
 (e) None of these
72. In a certain code language, 134 means **good and tasty**, 478 means **see good pictures** and 729 means **pictures are faint**. Which of the following numerical symbols stands for **see** ?
 (a) 1 (b) 2
 (c) 7 (d) 8
 (e) None of these
73. BRIDGE is written as EULGJH in a certain code. How will FRUIT be written in that code ?
 (a) IUXLW (b) IVLXW
 (c) IUWXL (d) IUXVT
 (e) None of these
74. In a certain code language DREA is written as BFSE, MING is written as FMHL और TREA is written as BFSU How will TISE be written in that code ?
 (a) DTHS (b) DSTV
 (c) DSHS (d) FUGS
 (e) None of these
75. ENGLAND is written as 1234526 and FRANCE as 785291. How will GREECE be written in this coding scheme ?
 (a) 381191 (b) 381911
 (c) 394132 (d) 562134
 (e) None of these

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ANSWER KEY

1	(a)	17	(e)	33	(a)	49	(a)	65	(a)
2	(b)	18	(d)	34	(b)	50	(b)	66	(b)
3	(c)	19	(c)	35	(b)	51	(c)	67	(c)
4	(d)	20	(b)	36	(d)	52	(e)	68	(e)
5	(a)	21	(b)	37	(d)	53	(d)	69	(a)
6	(b)	22	(b)	38	(c)	54	(a)	70	(b)
7	(c)	23	(d)	39	(d)	55	(c)	71	(d)
8	(a)	24	(a)	40	(a)	56	(b)	72	(d)
9	(a)	25	(b)	41	(c)	57	(e)	73	(a)
10	(d)	26	(a)	42	(b)	58	(d)	74	(e)
11	(d)	27	(c)	43	(d)	59	(d)	75	(a)
12	(e)	28	(e)	44	(d)	60	(c)		
13	(a)	29	(d)	45	(a)	61	(e)		
14	(e)	30	(c)	46	(a)	62	(d)		
15	(a)	31	(b)	47	(b)	63	(b)		
16	(a)	32	(d)	48	(b)	64	(c)		

ANSWERS & EXPLANATIONS

1. (a) As,

P U L S E
 $\begin{matrix} -1 & -1 & -1 & -1 & -1 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ O & T & K & R & D \end{matrix}$

reverse order
 D R K T O

and N E W
 $\begin{matrix} -1 & -1 & -1 \\ \downarrow & \downarrow & \downarrow \\ M & D & V \end{matrix}$

reverse order
 V D M

Similarly,

P R O B E S
 $\begin{matrix} -1 & -1 & -1 & -1 & -1 & -1 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ O & Q & N & A & D & R \end{matrix}$

reverse order
 R D A N Q O

Hence, required code: RDANQO

2. (b) As,

R E M I T
 $\begin{matrix} \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ * & \text{£} & 3 & \square & 7 \end{matrix}$

and

C O N S U L
 $\begin{matrix} \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ = & \% & 8 & \beta & \$ & 5 \end{matrix}$

Similarly,

O C E L O T
 $\begin{matrix} \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ \% & = & \text{£} & 5 & \% & 7 \end{matrix}$

3. (c)

1 2 3 4 5 → 4 1 3 5 2
 A M O N G → N A O G M
 1 2 3 4 5 → 4 1 3 5 2
 S P I N E → N S I E P

Hence,

1 2 3 4 5 → 4 1 3 5 2
 L A M O N → O L M N A

4. (d) As,

R E T A I L
 $\begin{matrix} \swarrow & \downarrow & \searrow & \downarrow & \downarrow & \downarrow \\ +1 & +1 & +1 & +1 & +1 & +1 \\ U & F & S & B & J & M \end{matrix}$

Similarly,

E X P E C T
 $\begin{matrix} \swarrow & \downarrow & \searrow & \downarrow & \downarrow & \downarrow \\ +1 & +1 & +1 & +1 & +1 & +1 \\ Q & Y & F & F & D & U \end{matrix}$

5. (a) S E A L and D O S E
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
 \$ 7 5 @ # 8 \$ 7

Hence,

S O L D
 ↓ ↓ ↓ ↓
 \$ 8 @ #

6. (b) B O N D D E A N
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
 1 5 4 3 3 8 6 4

Hence,

B E D
 ↓ ↓ ↓ ↓
 1 8 3

7. (c) N A M E S
 ↓+1 ↓+1 ↓+1 ↓+1 ↓+1
 O B N F T
 ↓ reverse order
 T F N B O

Similarly,

C R A N E
 ↓+1 ↓+1 ↓+1 ↓+1 ↓+1
 D S B O F
 ↓ reverse order
 F O B S D

8. (a) go [home] → ta [na]
 nice.little [home] → [na] japa
 Hence, code of 'go' is 'ta'

9. (a) As,

D A Y I O N G
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
 +1 ↓+1 +1 +1 ↓+1 +1
 Z B E K H O P

Similarly,

C O R D I A L
 ↓ ↓ ↓ ↓ ↓ ↓ ↓
 +1 ↓+1 +1 -1 +1 ↓+1 +1
 S P D C M B J

10. (d) Data is inadequate

11. (d) CHANDIGARH SIK KIM
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
 DNAHCHRAGI KIS MIK

12. (e) (do) re [me] (he) [is] late
 fa [me] la she [is] early
 so ti (do) (he) leaves soon

Hence re → Late

13. (a) Teacher write on blackboard with chalk, here chalk is called book, hence here the code of chalk is book.

14. (e) As,

M O T H E R
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
 +1 +1 +1
 O M H U R F

Similarly,

A N S W E R
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
 +1 +1 +1
 N A W T R F

15. (a) G R O W W I T H I N
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
 = @ % # # ÷ + © ÷ △

W I N G
 ↓ ↓ ↓ ↓
 # ÷ △ =

16. (a) 726395 = IMDNWI condition (i) is applied

17. (e) 263847 = MDNBKT

18. (d) 591248 = RWJMKB

19. (c) 615824 = YJRBMX condition (ii) is applied

20. (b) 831795 = BNJTWR

21. (b)

D E S I G N
 +2 ↓ -2 ↓ +2 ↓ -2 ↓ +2 ↓ -2 ↓
 F C U G I L

Similarly,

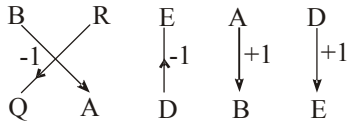
R E P O R T
 +2 ↓ -2 ↓ +2 ↓ -2 ↓ +2 ↓ -2 ↓
 T C R M T R

22. (b)

C R E A M
 ↓ ↓ ↓ ↓ ↓
 -1 -1 +1 +1
 Q -1 B D B N

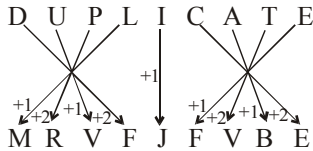
In the reverse order of above code we obtain NBDBQ which is the given code in question.

Similarly,

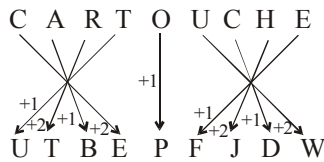


In the reverse order of above code we obtain EBDAQ.

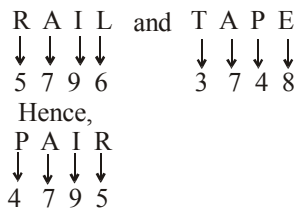
23. (d) As,



Similarly,



24. (a) As,



25. (b) 2 7 0 5 1 4
 ↓ ↓ ↓ ↓ ↓ ↓
 \$ % L T K Q

condition (ii) is applied

26. (a) 3 6 4 2 7 9
 ↓ ↓ ↓ ↓ ↓ ↓
 © H \$ Q % ©

condition (i) is applied

27. (c) 8 7 5 3 0 6
 ↓ ↓ ↓ ↓ ↓ ↓
 H % T # L J

condition (ii) is applied

28. (e) 5 9 2 4 7 6
 ↓ ↓ ↓ ↓ ↓ ↓
 T @ Q \$ % H

29. (d) 4 6 8 9 1 0
 ↓ ↓ ↓ ↓ ↓ ↓
 \$ H J @ K ★

condition (iii) is applied

30. (c) As,

CHITON → IHCNOT
 1 2 3 4 5 6 3 2 1 6 5 4

Similarly,

DILATE → LI DET A
 1 2 3 4 5 6 3 2 1 6 5 4.

31. (b) You are → Se Pa

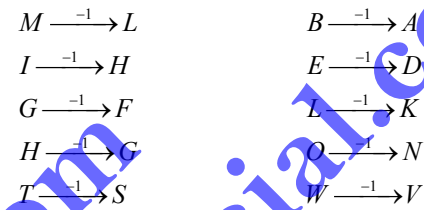
See you → La se

and, Parrots are → Ni pa

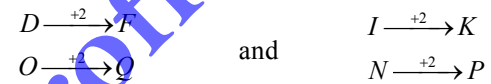
∴ See parrots → La Ni

32. (d) As,

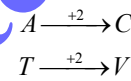
Similarly,



33. (a) As,

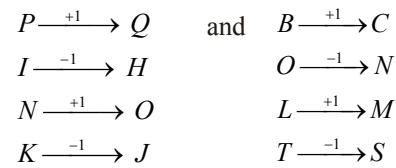


Similarly,

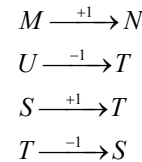


34. (b) W R O M B T → 7 1 9 4 8 3

35. (b) As,

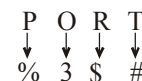


Similarly,



36. (d) R O P E and R I T E
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
 \$ 3 % 6 \$ 4 # 6

Hence,



37. (d) $\begin{matrix} H & O & U & S & E \\ +1\downarrow & +1\downarrow & +1\downarrow & +1\downarrow & +1\downarrow \\ I & P & V & T & F \end{matrix}$

Reverse order of code is FTVPI.

Similarly,

$\begin{matrix} C & H & A & I & R \\ +1\downarrow & +1\downarrow & +1\downarrow & +1\downarrow & +1\downarrow \\ D & I & B & J & S \end{matrix}$

required code is SJBID

38. (c) $\begin{matrix} C & O & I & M & B & A & T & O & R & E \\ +1\downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ D & P & J & N & C & B & U & P & S & F \end{matrix}$

Similarly,

$\begin{matrix} I & N & D & O & R & E \\ +1\downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow +1 \\ J & O & E & P & S & F \end{matrix}$

39. (d) in (ba) pe → he (has) won

le ke (ba) → she (has) lost

in se pe → he always won

Code for word 'he' is 'in or 'pe'.

40. (a) $\begin{matrix} 4 & 3 & 5 & 9 & 7 & 1 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ ? & + & \% & \star & \# & \$ \end{matrix}$

41. (c) $\begin{matrix} E & N & I & M & Y \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 1 & 7 & 3 & 2 & 8 \end{matrix}$

42. (b) $\begin{matrix} G & E & N & I & R \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 6 & \% & 3 & 9 & \end{matrix}$

condition (ii) is applied

43. (d) $\begin{matrix} Q & U & E & R & I \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ ? & 4 & 1 & 9 & ? \end{matrix}$

condition (iii) is applied

44. (d) $\begin{matrix} E & I & N & U & M \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 1 & 3 & 7 & 4 & 2 \end{matrix}$

45. (a) $\begin{matrix} U & N & G & R & E \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ \$ & 7 & 6 & 9 & \$ \end{matrix}$

condition (i) is applied

46. (a) $\begin{matrix} B & A & K & E & & & B & I & T \\ \downarrow & \downarrow & \downarrow & \downarrow & & & \downarrow & \downarrow & \downarrow \\ 3 & 7 & 9 & 2 & & & 3 & 6 & 8 \end{matrix}$

Hence, $\begin{matrix} B & I & T & E \\ \downarrow & \downarrow & \downarrow & \downarrow \\ 3 & 6 & 8 & 2 \end{matrix}$

47. (b) As,

$\begin{matrix} G & R & O & U & P \\ -1\downarrow & -1\downarrow & -1\downarrow & -1\downarrow & -1\downarrow \\ F & Q & N & T & O \\ & & \downarrow & & \text{reverse order} \\ O & T & N & Q & F \end{matrix}$

Similarly,

$\begin{matrix} T & H & E & I & R \\ -1\downarrow & -1\downarrow & -1\downarrow & -1\downarrow & -1\downarrow \\ S & G & D & H & Q \\ & & \downarrow & & \\ Q & H & D & G & S \end{matrix}$

48. (b) As,

$\begin{matrix} L & O & C & K \\ +1\downarrow & +1\downarrow & -1\downarrow & -1\downarrow \\ M & P & B & J \end{matrix}$
and
 $\begin{matrix} B & L & O & W \\ +1\downarrow & +1\downarrow & -1\downarrow & -1\downarrow \\ C & M & N & V \end{matrix}$

Similarly,

$\begin{matrix} W & I & N & E \\ +1\downarrow & +1\downarrow & -1\downarrow & -1\downarrow \\ X & J & M & D \end{matrix}$

49. (a) 2976581 → B@\$©P=B

50. (b) 7269534 → KB©@PT\$

51. (c) 8135246 → ©CTPBK©

52. (e) 4352718 → =TPB\$C=

53. (d) 9256473 → XBP©K\$X

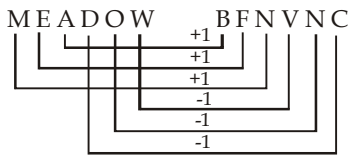
54. (a) $\begin{matrix} G & O & N & E \\ \downarrow & \downarrow & \downarrow & \downarrow \\ 5 & 1 & 3 & 9 \end{matrix}$

and $\begin{matrix} N & O & D & A & L \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 3 & 1 & 2 & 6 & 8 \end{matrix}$

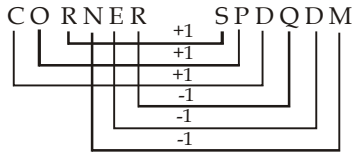
Hence, $\begin{matrix} L & O & D & G & E \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 8 & 1 & 2 & 5 & 9 \end{matrix}$



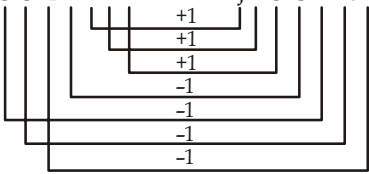
55. (c)



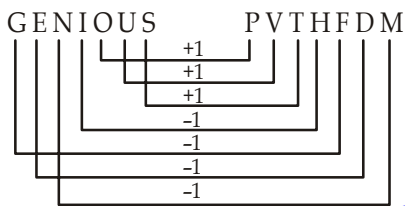
Similarly,



56. (b) SOLDIER JFSCRNK



Similarly,



57. (e) The colour of blood is red and here red means orange.

58. (d) K I T E and S T U D
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
 % 2 \$ # @ \$ 5 7

So, D E S K
 ↓ ↓ ↓ ↓
 7 # @ %

(59-63): colours of the sky
 ⇒ ki la fa so
 rainbow colours ⇒ ro ki
sky high rocket ⇒ la pe jo
the rocket world
 ⇒ pe so ne

59. (d) colours sky high ⇒ ki la jo

60. (c) The code of 'the' is 'so'.

61. (e) 'pe' represents 'rocket'.

62. (d) 'of the rainbow sky' is coded as 'fa so ro la'. So the answer could be option (b) or (d). The code for 'rocket' is 'pe', so option (b) is not correct. So option (d) is the correct answer, as the code for 'bird' cannot be found from the given information.

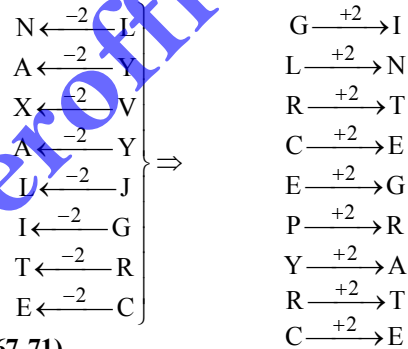
63. (b) Code for 'high' is 'jo'.

64. (c) bring the White board ⇒ ka na di pa

white and black board ⇒ na di sa ra
 ∴ the ⇒ ka or pa

65. (a) RBM STD BRO PUS ≡ the cat is beautiful ... (i)
 TNH PUS DIM STD ≡ the dog is brown ... (ii)
 PUS DIM BRO PUS CUS ≡ the dog has the cat ... (iii)
 (i) and (ii) ⇒ STD PUS ≡ is the
 (ii) and (iii) ⇒ PUS DIM ≡ the dog
 (i) and (iii) ⇒ PUS BRO ≡ the cat
 ∴ From (iii), CUS ≡ has

66. (b) As, Similarly,



For (Qs. 67-71)

67. (c)

Letter	E	H	N	D	J	V
Code	#	4	2	3	9	8

Condition is applied.

68. (e)

Letter	K	Q	D	J	N	H
Code	7	6	3	9	2	4

69. (a)

Letter	A	J	N	V	Q	E
Code	#	9	2	8	6	#

Condition is applied.

70. (b)

Letter	Q	H	J	V	N	D
Code	6	4	9	8	2	3

71. (d)

Letter	J	K	E	D	H	A
Code	9	7	1	3	4	#

Condition is applied.

72. (d) 134 ≡ Good and tasty ... (i)
 478 ≡ See good pictures. ... (ii)
 729 ≡ Pictures are faint ... (iii)

Form (i) and (ii) 4 ≡ good
 and from (ii) and (iii) 7 ≡ pictures
 Hence the code for see is 8

73. (a) As, Similarly,

$B \xleftarrow{+3} E$	$F \xleftarrow{+3} I$
$R \xleftarrow{+3} U$	$R \xleftarrow{+3} U$
$I \xleftarrow{+3} L$	$U \xleftarrow{+3} X$
$D \xleftarrow{+3} G$	$I \xleftarrow{+3} L$
$G \xleftarrow{+3} J$	$T \xleftarrow{+3} W$
$E \xleftarrow{+3} H$	

74. (e)

D R E A	M I N G
+1 ↙ ↘	-1 ↙ ↘
B F S E	F M H L

Similarly,

T R E A	T I S E
+1 ↙ ↘	-1 ↙ ↘
B F S U	D R H S

75. (a) $G \rightarrow 3, R \rightarrow 8, E \rightarrow 1, C \rightarrow 9$.
 Similarly, Greece \rightarrow 381191.

◆◆◆

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SERIES

CHAPTER 4

SERIES

Series consist of items having identical features.

Series tests are a type of aptitude test which require you to find the missing or wrong number in a sequence. This missing or wrong number may be at the beginning or middle or at the end of the sequence. The crux of solving these questions lie in identifying the common feature.

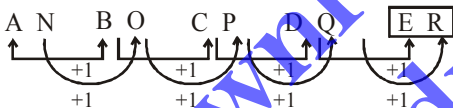
Type of questions

► Type I Letter based Series

ILLUSTRATION 1: Which of the following will come in place of the question mark (?) in the series given below?

AN, BO, CP, DQ, ?

- (a) BQ (b) AD
(c) ER (d) RE

Sol. (c) 

Hence, 'ER' will come in place of the question mark.

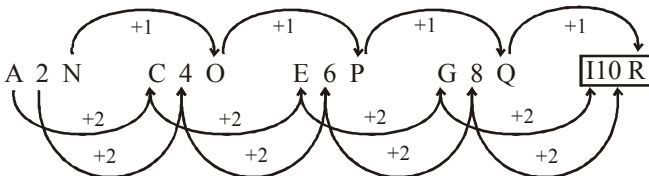
► Type II Letter and Number Based Series

ILLUSTRATION 2: Which of the following will come in place of the question mark (?) in the series given below?

A2N C4O E6P G8Q ?

- (a) I10R (b) I12R
(c) I10Q (d) I10R

Sol. (a)



Hence, 'I 10 R' will come in place of the question mark.

► Type III Missing Letters or Numbers based Series

ILLUSTRATION 3: Which one of the following is the correct order of missing letters in the series given below?

a-ab-bc-cd—d

- (a) aaaa (b) bbbb
(c) cccc (d) abcd

Sol. (d) The series is: aaa/bbb/ccg/ddd

Hence, abcd will complete the series

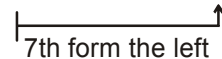
► Type IV Series based on arrangement of Letters and Numbers

ILLUSTRATION 4: In the arrangement of letters and numbers given below, first all the numbers are arranged in descending order and then all the letters are written in alphabetical order. Then which letter/ number will be 4th to the left of the 11th element from the left end in the new arrangement?

P N 3 W 9 Q 1 8 L K 4 6 B 7

- (a) K (b) 3
(c) B (d) 1
(e) None of these

Sol. (d) 9 8 7 6 4 3 1 B K L N P Q W


7th from the left

Hence, $(11-4 = 7)$ 7th letter/ number (1) will be 4th to the left of the 11th element from the left end in the new arrangement.

SOLVED EXAMPLES

EXAMPLE 1: What will come in place of question mark (?) in the alphabetical order given below ?

A C A B B D B C C E C ?

- (a) B (b) F
(c) D (d) C
(e) None of these

Sol. (c) $A \xrightarrow{+2} C, A \xrightarrow{+1} B$

$B \xrightarrow{+2} D, B \xrightarrow{+1} C$

$C \xrightarrow{+2} E, C \xrightarrow{+1} D$

EXAMPLE 2: Which number will come next in the following series?

2 1 2 1 3 2 1 3 4 2 1 3 4 5 2 1 3 4 5 6 2 1 3 4 5 ?

- (a) 6 (b) 7
(c) 8 (d) 5
(e) None of these

Sol. (a) The series proceeds as follows :

21

213

2134

21345

213456

21345(6)7

EXAMPLE 3: Which one of the following is the correct order of missing letters in the series given below ?

_ stt _ tt _ tts _

- (a) tsts (b) ttst
(c) sstt (d) tsst
(e) None of these

Sol. (d) The series is: tst/tst/tst/tst. Thus, the term 'tst' is repeated

EXAMPLE 4: Second and third digits of each number given below are interchanged. Then, the 1st and the last digits of each new number thus formed are interchanged. Which of the following numbers then will be the highest number among the five ?

273 372 438 184 526

- (a) 273 (b) 372
(c) 438 (d) 184
(e) 526

Sol. (d) $273 \Rightarrow 237 \Rightarrow 732$

$372 \Rightarrow 327 \Rightarrow 723$

$438 \Rightarrow 483 \Rightarrow 384$

$184 \Rightarrow 148 \Rightarrow 841$

$526 \Rightarrow 562 \Rightarrow 265$

\therefore highest number is $841 \Rightarrow 184$

EXAMPLE 5: In the number 76534218 each digit is replaced by the next digit i.e., '1' is replaced by '2', '2' is replaced by '3' and so on and then the digits are arranged in ascending order from left to right. Which digit will be fifth from the left end?

- (a) 6 (b) 5
(c) 7 (d) 4
(e) None of these

Sol. (a) $76534218 \rightarrow 87645329$

ascending order of digits

2 3 4 5 (6) 7 8 9

fifth from the left

Directions (Examples 6-10): Study carefully the following arrangement of letters, digits and symbols to answer these questions.

M 7 £ 8 L P @ ? 6 N ß T Y 3 2 = E \$ 4 9 © G H 5

EXAMPLE 6: How many such letters are there in the arrangement each of which is immediately followed by a number?

- (a) Three (b) Four
(c) One (d) Two
(e) None of these

Sol. (a) Letter Number

Such combinations are: (M7), (Y3), (H5)

EXAMPLE 7: How many such symbols are there in the arrangement each of which is immediately preceded by a number?

- (a) Two (b) Three
(c) Four (d) Nil
(e) None of these

Sol. (b) Number Symbol

Such combinations are: (7£), (2=), (9©)

EXAMPLE 8: If all the symbols are deleted from the arrangement, which of the following will be fourth to the left of the 17th element from the left end ?

- (a) 9 (b) E
(c) 2 (d) Y
(e) None of these

Sol. (e) New arrangement is:

M 7 8 L P 6 N T Y 3 2 E 4 9 G H 5

The fourth to the left of the 17th element from the left end $(17 - 4) = 13$ th from the left $\Rightarrow 4$.

EXAMPLE 9 : '78' is to 'P?6' and '?N' is to 'T32' in the same way as '2E' is to in the arrangement.

- (a) 9CG (b) 49G
(c) 4CG (d) 9GH
(e) None of these

Sol. (c) $7 \xrightarrow{+4} P$

$8 \xrightarrow{+4} ? \xrightarrow{+1} 6$

$? \xrightarrow{+4} T$

$N \xrightarrow{+4} 3 \xrightarrow{+1} 2$

Similarly,

$2 \xrightarrow{+4} 4$

$E \xrightarrow{+4} \textcircled{C} \xrightarrow{+1} G$

EXAMPLE 10 : If all the numbers are deleted from the arrangement, then which of the following will be fifth to the right of the 13th element from the right end? .

- (a) β (b) N
(c) Y (d) T
(e) None of these

Sol. (d) New arrangement

M £ L P @ ? N β T Y = E \$ © G H

The fifth to the right of the 13th element from the right end (13 - 5 =) 8th from the right \Rightarrow T

EXERCISE

- What will come in place of the question mark (?) in the following alphabet series?
AC EH IM MR ?
(a) MI (b) IL
(c) IM (d) QW
(e) None of these
- What will come in place of the question mark (?) in the following series of the English alphabet?
AE, CG, EI, GK, ?
(a) MI (b) IM
(c) HM (d) IL
(e) None of these
- Which of the following will come in place of the question mark (?) in the order given below?
ABABCBCBCDCD?
(a) D (b) E
(c) C (d) F
(e) None of these
- Which of the letters will come next in the following series?
a ab abc abcd abcde abcde?
(a) a (b) f
(c) b (d) Cannot be determined
(e) None of these
- What should come next in the following letter series?
b a c b a c d b a c d e b a c d e f b a c d ?
(a) c (b) d
(c) e (d) f
(e) g
- The following groups of alphabets form a certain pattern with regard to their position in the English alphabetical series. Based upon the pattern, which of the following five alternatives should replace the question mark?
XDH, VGJ, TJL, RMN, ?
(l) QQP (b) PPP
(c) SNO (d) QLM
(e) None of these
- What will come in place of the question mark (?) in the following alphabet series?
CD FG JK ? UV
(a) NP (b) OP
(c) MN (d) OS
(e) LP
- What should come next in the following letter series?
H G F E D C B A H G F E D C B H G F E D C H
(a) F (b) G
(c) B (d) A
(e) None of these
- What should come next in the following letter series?
HGFEDCBAGFEDCBAFEDCBA
(a) E (b) G
(c) F (d) B
(e) None of these
- Which one of the following is the correct order of missing letters in the series given below?
_ a _ b _ ab a a _ bab _ abb
(a) aaabb (b) ababb
(c) babab (d) babba
(e) None of these
- Which one of the following is the correct order of missing letters in the series given below?
_ tu _ rt _ s _ _ usrtu _
(a) rtusru (b) rsutrr
(c) rsurtr (d) rsurts
(e) None of these

12. Which one of the following is the correct order of missing letters in the series given below ?
 __ aba __ ba _ ab
 (a) abbbba (b) abbab
 (c) baabb (d) bbaba
 (e) None of these
13. Which one of the following is the correct order of missing letters in the series given below ?
 _ bbca _ bcca _ ac _ a _ cb
 (a) abeba (b) acbab
 (c) bacab (d) bcaajb
 (e) None of these
14. Which one of the following is the correct order of missing letters in the series given below ?
 ac _ cab _ baca _ aba _ acac
 (a) aacb (b) acbc
 (c) babb (d) bcbb
 (e) None of these
15. Which one of the following is the correct order of missing letters in the series given below ?
 aab _ aa _ bbb _ aaa _ bbba
 (a) abba (b) baab
 (c) aaab (d) abab
 (e) None of these
16. Which one of the following is the correct order of missing letters in the series given below ?
 a _ n _ b _ _ ncb _ _ ncb
 (a) abbbcc (b) abcacb
 (c) bacbab (d) bcabab
 (e) None of these
17. Which one of the following is the correct order of missing letters in the series given below ?
 cccbb _ aa _ cc _ bbbaa _ c
 (a) aebe (b) baca
 (c) baba (d) acba
 (e) None of these
18. Which one of the following is the correct order of missing letters in the series given below ?
 bca _ b _ aabc _ a _ caa
 (a) acab (b) bcbb
 (c) cbab (d) ccab
 (e) None of these
19. Which one of the following is the correct order of missing letters in the series given below ?
 m _ nm _ n _ an _ a _ ma _
 (a) aamnan (b) ammann
 (c) aammnn (d) amammn
 (e) None of these
20. Which one of the following is the correct order of missing letters in the series given below ?
 _ op _ mo _ n _ _ pnmpop _
 (a) mnpmon (b) mpnmop
 (c) mnompn (d) mnpomn
 (e) None of these
21. Which one of the following is the correct order of missing letters in the series given below ?
 _ nmmn _ mmmn _ mnnm _
 (a) nmmn (b) mmmn
 (c) nmm (d) mmm
 (e) None of these
22. Which one of the following is the correct order of missing letters in the series given below ?
 a _ ba _ b _ b _ a _ b
 (a) abaab (b) abbab
 (c) aabba (d) bbabb
 (e) None of these
- Directions (Q. 23-29):** Study the following arrangement carefully and answer the questions given below.
 R 4 E J 5 T 1 A M Q 3 8 N I K 7 W F 6 D 9 U 2 Y V
23. Four of the following five are alike in a certain way based on their positions in the above arrangement and so form a group. Which is the one that does not belong to this group?
 (a) J54 (b) 38M
 (c) 7WI (d) 2Y9
 (e) 8IQ
24. How many such vowels are there in the above arrangement, each of which is immediately preceded by a number and immediately followed by a consonant?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
25. How many such numbers are there in the above arrangement, each of which is immediately preceded by a consonant but not immediately followed by a consonant?
 (a) One (b) Two
 (c) Three (d) Four
26. Which of the following is exactly in the middle between A and D in the above arrangement?
 (a) I (b) N
 (c) K (d) 8
 (e) None of these
27. If all the numbers in the above arrangement are dropped, which of the following will be the ninth to the left of D?
 (a) T (b) A
 (c) V (d) J
 (e) None of these
28. Which of the following is the sixth to the left of the eleventh from the left end of the above arrangement?
 (a) M (b) 9
 (c) W (d) 5
 (e) None of these
29. Which of the following is the fourth to the right of the tenth from the right end of the above arrangement?
 (a) 8 (b) D
 (c) I (d) T
 (e) None of these

Directions (Q.30 - 34): Study the following arrangement carefully, and answer the questions given below:

B 2 I J K 4 3 H 5 E R P 6 N A 9 W 8 T U 1 V D 7 F

30. Which of the following is the third to the right of the tenth from the right end of the above arrangement?
- (a) 3 (b) 6
(c) T (d) E
(e) None of these
31. How many such numbers are there in the above arrangement each of which is immediately preceded by a vowel and immediately followed by a consonant ?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
32. How many such consonants are there in the given arrangement each of which is immediately followed by a number but not immediately preceded by a vowel?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
33. Four of the following five are alike in a certain way and so form a group based on their positions in the given arrangement. Which is the one that does not belong to this group?
- (a) JK4 (b) PRE
(c) 6NA (d) 8TU
(e) 1VD
34. What should come in place of the question mark (?) in the following series based on the given arrangement?
2J 4H EP ?
- (a) N9 (b) NW
(c) AW (d) 6A
(e) None of these
- Directions (Q. 35-41):** Study the following arrangement carefully and answer these questions.
O 4 E J 5 T 1 A M Q 3 8 N I K 7 W F 6 S 9 U 2 Y X
35. Four of the following five are alike in a certain way based on their positions in the above arrangement and so form a group. Which is the one that does not belong to this group?
- (a) J54 (b) 38M
(c) 7WI (d) 2Y9
(e) 8IQ
36. How many such vowels, are there in the above arrangement, each of which is immediately preceded by a number and immediately followed by a consonant ?
- (a) None (b) One
(c) Two (d) Three
(e) More than three

37. How many such numbers are there in the above arrangement, each of which is immediately preceded by a consonant and also immediately followed by a consonant?
- (a) One (b) Two
(c) Three (d) Four
(e) More than four
38. Which of the following is exactly in the middle between A and S in the above arrangement?
- (a) I (b) N
(c) K (d) 8
(e) None of these
39. If all the numbers in the above arrangement are dropped, which of the following will be the ninth to the left of S?
- (a) T (b) A
(c) V (d) J
(e) None of these
40. Which of the following is the sixth to the left of the eleventh from the left end of the above arrangement?
- (a) M (b) 9
(c) W (d) 5
(e) None of these
41. Which of the following is the fourth to the right of the tenth from the right end of the above arrangement?
- (a) 8 (b) S
(c) I (d) T
(e) None of these

Directions (Q. 42-46): Study of the following arrangement carefully and answer the questions given below.

Q E * P M 8 R A @ C 9 U H W # J Z S β Y N 5 \$ G I T

42. How many such vowels are there in the above arrangement each of which is immediately followed by a symbol
- (a) None (b) One
(c) Three (d) More than three
(e) None of these
43. What should come in place of the question mark (?) in the following series based on the above arrangement ?
QP@ MAH @UZ ?
- (a) H#Y (b) WZY
(c) HJN (d) 9#S
(e) None of these
44. Which of the following is eighth to the right of the thirteenth element from the left end of the arrangement?
- (a) M (b) N
(c) 5 (d) 8
(e) None of these
45. Which of the following is exactly in the middle between the twelfth from the right and the seventh from the left end?
- (a) 3 (b) #
(c) U (d) 9
(e) None of these
46. If the first element in the above arrangement exchanges its position with the element in the 26th position and the second with the one in the 25th position and so on, which of the following will be in the tenth position from the left after rearrangement?
- (a) Z (b) M
(c) C (d) 5
(e) None of these

Directions (Q. 47-51): These questions are based on the following arrangement. Study it carefully and answer the questions.

J ★ R 3 P L 2 # I N 7 O C @ K 5 D = M \$ 6 B > A Q 4

47. Four of the following five are alike in a certain way based on the positions of the elements in the arrangement and hence form a group. Which one does not belong to the group?
 (a) 23 # (b) O I C
 (c) K O 5 (d) # P I
 (e) B \$ >
48. What will come in place of the question mark in the following series based on the above arrangement?
 PRJ # L3 712 @ ON ?
 (a) DKC (b) 5@O
 (c) DK@ (d) =5@
 (e) None of these
49. If the above arrangement is written in reverse order, which element will be eleventh to the left of sixteenth from the left?
 (a) J (b) 6
 (c) B (d) >
 (e) None of these
50. How many such numbers are there in the above arrangement which are not immediately followed by a symbol and also are immediately preceded by a consonant?
 (a) Nil (b) Two
 (c) Four (d) Three
 (e) None of these
51. How many such symbols are there in the above arrangement each of which is immediately followed by a consonant and immediately preceded by a number ?
 (a) One (b) Two
 (c) Three (d) More than three
 (e) None of these

Directions (Q. 52-56): Study the following arrangement carefully and answer the questions given below.

7 R E T 4 A 9 % D F 1 U # B @ 8 H I © W M ★ 3 2 V \$ 5 N P 6 Q

52. How many such consonants are there in the above arrangement, each of which is immediately preceded by a consonant and immediately followed by a number ?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
53. How many such numbers are there in the above arrangement, each of which is immediately preceded by a letter but not immediately followed by a symbol?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
54. How many such vowels are there in the above arrangement, each of which is immediately followed by a symbol ?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three

55. Four of the following five are alike in a certain way based on their position in the above arrangement and so form a group. Which is the one that does not belong to the group?
 (a) RTA (b) 9DF
 (c) #@H (d) 3V5
 (e) IW ★
56. Which of the following is the fourth to the left of the twelfth from the left end ?
 (a) % (b) 8
 (c) 2 (d) H
 (e) None of these
57. In the arrangement P26 M9 K S 4 V 7, the positions of the 1st and the 6th elements are interchanged, those of the 2nd and the 7th are interchanged, and so on. Then, which of the following will be the 4th element from the left end in the fresh, arrangement?
 (a) M (b) 7
 (c) 4 (d) 9
 (e) None of these

Directions (Q. 58-62): To answer these questions study carefully the following arrangement of letters, digits and symbols.

6 = £ C E 3 8 G L M 7 ★ @ P R 4 © N T 5 \$ V

58. How many such letters are there in the arrangement each of which is immediately followed by a symbol?
 (a) None (b) One
 (c) Two (d) Three
 (e) None of these
59. How many such symbols are there in the arrangement each of which is immediately preceded by a number ?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
60. How many such digits are there in the arrangement each of which is immediately preceded by a letter?
 (a) One (b) Two
 (c) Three (d) Four
 (e) More than four
61. If all the symbols in the arrangement are removed, then which of the following will be the 7th to the left of the 13th element from the left end?
 (a) 3 (b) 8
 (c) G (d) L
 (e) None of these
62. If all the digits in the arrangement are removed, then which of the following will be the 8th to the right of the 15th element from the right end?
 (a) M (b) P
 (c) L (d) @
 (e) None of these

63. How many such numbers are there in the following series, each of which is immediately preceded by 6 but not immediately followed by 4?

3 8 6 8 4 2 6 9 8 4 6 8 4 8 6 2 6 8 4 8

- (a) None (b) One
(c) Two (d) Three
(e) More than three

Directions (Q. 64-66): These questions are based on the following letter/number/symbol arrangement. Study it carefully and answer the questions that follow.

5 D H E ★ 7 9 \$ F I 6 R % L 1 A J 3 B # 4 @ K P 8 U M 2

64. If all the symbols are removed from the above arrangement, which element will be third to the left of thirteenth from the left?

- (a) L (b) R
(c) 6 (d) I
(e) None of these

65. What will come in place of the question marks (?) in the following series based on the above arrangement ?

EDH 9 ★ 7 I \$ F ???

- (a) 6RI (b) %R6
(c) RI6 (d) %6R
(e) None of these

66. Which element will be fifth to the right of ninth from the right end if all the numbers are removed from the above arrangement?

- (a) K (b) @
(c) P (d) #
(e) None of these

Directions (Q. 67-71): The following questions are based on the five three digit numbers given below:

972 526 487 359 251

67. If the positions of the first and second digits are interchanged which of the following will be third if they are arranged in ascending order?

- (a) 359 (b) 972
(c) 526 (d) 487
(e) 251

68. If 2 is added to the sum of the digits of each of the above numbers how many will be multiples of 5?

- (a) None (b) One
(c) Two (d) Three
(e) None of these

69. If 1 is subtracted from the last digit of each of the above numbers, the sum of the digits of how many of them are prime numbers?

- (a) None (b) Two
(c) One (d) Three
(e) All five

70. If the digits in each of the above numbers are written in reverse order which will be the second highest number?

- (a) 251 (b) 359
(c) 487 (d) 526
(e) 972

71. If the positions of the digits of each of the numbers are interchanged such that the first becomes second, second becomes third and third becomes first, which of the following will be the highest?

- (a) 972 (b) 526
(c) 487 (d) 251
(e) 359

Directions (Q. 72-76): These questions are based on the following arrangement. Study it carefully and answer the questions.

8 H % 3 7 T A 4 # 6 B I @ R 1 Q ★ L E 2 K \$ U 5 9

72. Which element is sixth to the right of fifteenth from the right end ?

- (a) Q (b) ★
(c) L (d) 1
(e) None of these

73. Four of the following five are alike in a certain way on the basis of their positions in the above arrangement and so form a group. Which is the one that does not belong to the group ?

- (a) 1# (b) EQ
(c) 2★ (d) \$2
(e) 5K

74. How many such symbols are in the above arrangement each of which is immediately followed by a number but not immediately preceded by another number ?

- (a) None (b) One
(c) Two (d) Three
(e) Four

75. If all the symbols are dropped from the above arrangement, which element will be ninth from the left end ?

- (a) B (b) 6
(c) 4 (d) 1
(e) None of these

76. What will come in place of the question mark in the following series based on the above arrangement?

7 T 3 4 # A B I 6 ?

- (a) R@1 (b) IQR
(c) R1@ (d) Q★1
(e) None of these

Directions (Q. 77-82) : To answer these questions, study the following arrangement of digits, letters and symbols carefully.

6 N P = @ 7 1 £ R T 3 L B ★ E 4 © 8 G H \$ 5 K M ? 2 D C

77. '=N' is to 'T1' and 'B3' is to 'G4' in the same way as 'EB' is to
 (a) SH (b) \$8
 (c) \$G (d) SG
 (e) None of these
78. If all the letters in the arrangement are deleted, which of the following will be the third to the right of the 11th element from the right end?
 (a) ★ (b) £
 (c) 1 (d) ©
 (e) None of these
79. Four of the following five are alike in a certain way based on the positions of the elements in the arrangement and hence form a group. Which one does not belong to the group?
 (a) P=76 (b) £T37
 (c) 3L★R (d) ©8HE
 (e) 5K?H
80. If all the digits in the arrangement are deleted, which of the following will be midway between the 3rd and the 15th elements from the left end?
 (a) T (b) ★
 (c) L (d) B
 (e) None of these
81. How many such digits are there in the arrangement each of which is immediately followed by a symbol but not immediately preceded by a letter?
 (a) Nil (b) Three
 (c) One (d) Four
 (e) None of these
82. If all the symbols in the arrangement are deleted, which of the following will be the 4th to the left of the 12th element from the left end?
 (l) G (b) L
 (c) 3 (d) H
 (e) None of these
83. If the digits in the number 5734629 are arranged in ascending order from left to right, how many digits will remain at the same position?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
- Directions (Q. 84-88):** These questions are based on the following set of numbers.
 738 495 329 653 849
84. If in each number the first and the third digits are interchanged and the newly formed numbers are arranged in ascending order, which number will be the third?
 (a) 738 (b) 495
 (c) 329 (d) 653
 (e) 849
85. If '1' is added to the first digit of each number and '1' is subtracted from the second digit, which number will be the largest?
 (a) 738 (b) 495
 (c) 329 (d) 653
 (e) 849
86. If in each number the positions of the first and the second digits are interchanged which number will be the smallest?
 (a) 738 (b) 495
 (c) 329 (d) 653
 (e) 849
87. If '1' is subtracted from the last digit as well as the first digit and then the second and third digits are interchanged, which number will be the second if arranged in ascending order?
 (a) 653 (b) 849
 (c) 495 (d) 738
 (e) 329
88. If '1' is subtracted from the last digit of each number and then the numbers are arranged in descending order, which number will be the first?
 (a) 653 (b) 849
 (c) 495 (d) 738
 (e) 329
89. How many such digits are there in the number 83165 each of which is as far away from the beginning of the number as when the digits are rearranged in ascending order within the number?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
90. What would come next in the following number sequence?
 2 3 2 3 4 2 3 4 5 2 3 4 5 6 2 3 4 5 6 7 2 3 4
 (a) 6 (b) 5
 (c) 8 (d) 9
 (e) None of these
- Directions (Q. 91-95):** Following questions are based on the five three-digit numbers given.
 513 248 371 634 167
91. Which of the following is the middle digit of the second highest number among these numbers?
 (a) 1 (b) 4
 (c) 7 (d) 3
 (e) 6
92. Which of the following is the last digit of the middle number when they are arranged in ascending order?
 (a) 3 (b) 8
 (c) 1 (d) 4
 (e) 7
93. If the position of the first and third digits in each of these numbers are interchanged, which of the following will be the highest number among them?
 (a) 513 (b) 248
 (c) 371 (d) 634
 (e) 167

94. If the positions of the first and the second digits in each of these numbers are interchanged, Which of the following will be the lowest number among them?
 (a) 513 (b) 248
 (c) 371 (d) 634
 (e) 167
95. Which of the following represents the total of all the three digits of the lowest number among them ?
 (a) 9 (b) 15
 (c) 11 (d) 13
 (e) 14
96. The positions of how many digits in the number 7354612 will remain unchanged after the digits within the numbers are rearranged in descending order from left to right?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than Three
97. Which of the following will be the middle digit of the second lowest number among the five numbers given below?
 317 528 439 254 861
 (a) 1 (b) 2
 (c) 3 (d) 5
 (e) 6
98. The positions of the first and the second digits in the number 7986032451 are interchanged. Similarly the positions of the third and fourth digits are interchanged and so on. Which of the following will be the fifth digit from the right end after the rearrangement?
 (a) 3 (b) 6
 (c) 4 (d) 0
 (e) None of these
99. What should come next in the following number sequence ?
 2 2 3 2 3 4 2 3 4 5 2 3 4 5 6 2 3 4 5 6 7 2 3 4
 (a) 8 (b) 5
 (c) 6 (d) 2
 (e) None of these
100. How many such digits are there in the number 5231698 each of which is as faraway from the beginning of the number as when the digits are rearranged in ascending order ?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
101. In the following set of numbers, if '1' is added to the last digit and then the order of digits is reversed, which number will be fourth if arranged in ascending order?
 567, 284, 696, 865, 738
 (a) 567 (b) 284
 (c) 696 (d) 865
 (e) 738
102. In the set of three-digit numbers given below, the first two digits of each number are interchanged. Which one among them will be in the middle if they are arranged in ascending order after the change?
 230 422 328 516 138
 (a) 230 (b) 328
 (c) 516 (d) 138
 (e) None of these
103. If the digits of the number 5726489 are arranged in ascending order, how many digits will remain at the same position
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
104. How many such pairs of digits are there in the number 947863512, each of which has those many digits between them in the number as they have between them when arranged in descending order within the number ?
 (l) None (b) One
 (c) Two (d) Three
 (e) More than three
- Directions (Q. 105-106):** These questions are based on the following set of numbers.
 389 476 635 847 568
105. Which number will be the smallest if the first and the last digits are interchanged in all the numbers?
 (a) 389 (b) 476
 (c) 635 (d) 847
 (e) 568
106. If in all the numbers the first two digits are interchanged and then the numbers are arranged in ascending order, which number will be the second ?
 (a) 389 (b) 476
 (c) 635 (d) 847
 (e) 568
107. How many such pairs of digits are there in the number 7326985 each of which has as many digits between them in the given number as when the digits of the number are rearranged in ascending order within the number ?
 (a) Three (b) Nil
 (c) Two (d) One
 (e) None of these
108. How many such 4s are there in the following number series each of which is immediately followed by 5 but not immediately preceded by 3?
 5 4 4 3 3 4 5 4 5 5 3 4 4 3 4 5 4 3 3 5 4 5 4 3 5 4 4 3 5 4
 (a) Nil (b) One
 (c) Two (d) Three
 (e) More than three

109. How many such digits are there in the number 52361984 each of which is as far away from the beginning of the number as when the digits are rearranged in ascending order within the number?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
- Directions (110-111):** Following questions are based on the five three-digit numbers given below:
519 368 437 246 175
110. Which of the following is the sum of the middle digits of the highest and the lowest numbers?
- (a) 6 (b) 9
(c) 8 (d) 5
(e) None of these
111. Which of the following is the third digit of the second highest number?
- (a) 9 (b) 8
(c) 7 (d) 6
(e) 5
112. In the number 7524693, how many digits will be as far away from the beginning of the number if arranged in ascending order as they are in the number?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
113. If the digits of the number 26839514 are arranged in descending order, the position of how many digits will remain unchanged?
- (a) One (b) Two
(c) Three (d) Four
(e) None
114. If two is subtracted from each odd digit and three is added to each even digit in the number 3675249, how many digits will appear twice in the new number thus formed?
- (a) None (b) One
(c) Two (d) Three
(e) Four
115. How many such digits are there in the number 5831649 each of which is as far away from the beginning of the number as when the digits are rearranged in ascending order?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
116. If the numbers from 1 to 45 which are exactly divisible by 3 are arranged in ascending order, minimum number being on the top, which would come at the ninth place from the top?
- (a) 18 (b) 24
(c) 21 (d) 27
(e) None of these
117. What should come next in the following letter series?
nsi, org, pqe, qpc, ?
- (a) pqa (b) rqd
(c) aor (d) roa
(e) None of these
118. The positions of the first and the fifth digits in the number 53216894 are interchanged. Similarly the positions of the second and the sixth digits are interchanged and so on. Which of the following will be the second from the right end after the rearrangement?
- (a) 3 (b) 2
(c) 1 (d) 9
(e) None of these
119. The positions of how many digits in the number 53147926 will remain unchanged after the digits within the number are rearranged in descending order?
- (a) None (b) One
(c) Two (d) Three
(e) More than three

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ANSWER KEY

1	(d)	26	(a)	51	(e)	76	(c)	101	(a)
2	(b)	27	(a)	52	(c)	77	(b)	102	(e)
3	(b)	28	(d)	53	(d)	78	(a)	103	(d)
4	(b)	29	(b)	54	(c)	79	(b)	104	(e)
5	(c)	30	(c)	55	(b)	80	(d)	105	(c)
6	(b)	31	(c)	56	(a)	81	(c)	106	(d)
7	(b)	32	(e)	57	(e)	82	(c)	107	(e)
8	(b)	33	(b)	58	(a)	83	(c)	108	(c)
9	(a)	34	(a)	59	(e)	84	(a)	109	(d)
10	(d)	35	(e)	60	(d)	85	(e)	110	(c)
11	(d)	36	(c)	61	(c)	86	(c)	111	(e)
12	(b)	37	(c)	62	(b)	87	(c)	112	(b)
13	(b)	38	(a)	63	(c)	88	(b)	113	(e)
14	(a)	39	(a)	64	(b)	89	(c)	114	(c)
15	(b)	40	(d)	65	(d)	90	(b)	115	(c)
16	(d)	41	(b)	66	(a)	91	(a)	116	(d)
17	(b)	42	(e)	67	(a)	92	(e)	117	(d)
18	(a)	43	(c)	68	(d)	93	(b)	118	(b)
19	(c)	44	(b)	69	(b)	94	(a)	119	(b)
20	(a)	45	(d)	70	(c)	95	(e)		
21	(c)	46	(a)	71	(e)	96	(d)		
22	(d)	47	(e)	72	(b)	97	(a)		
23	(e)	48	(a)	73	(d)	98	(d)		
24	(c)	49	(c)	74	(b)	99	(b)		
25	(d)	50	(c)	75	(a)	100	(d)		

ANSWERS & EXPLANATIONS

- (d) First letter of each term is + 4 letters ahead of the previous term. Similarly second letter is + 5 letters ahead of the previous term.
- (b) $A \xrightarrow{-2+} C \xrightarrow{-2+} E \xrightarrow{-2+} G \xrightarrow{-2+} I$
 $E \xrightarrow{-2+} G \xrightarrow{-2+} I \xrightarrow{-2+} K \xrightarrow{-2+} M$
- (b) A B A, B C B, C B C, D C D, E D E.
- (b) a, ab, abc, abcd, abcde, abcdef
- (c) bac bacd bacde bacdef bacd E fg
- (b) $X \xrightarrow{-2} V \xrightarrow{-2} T \xrightarrow{-2} R \xrightarrow{-2} P$
 $D \xrightarrow{+3} G \xrightarrow{+3} J \xrightarrow{+3} M \xrightarrow{+3} P$
 $H \xrightarrow{+2} J \xrightarrow{+2} L \xrightarrow{+2} N \xrightarrow{+2} P$
- (b) $C \xrightarrow{+3} F \xrightarrow{+4} J \xrightarrow{+5} O \xrightarrow{+6} U$
 $D \xrightarrow{+3} G \xrightarrow{+4} K \xrightarrow{+5} P \xrightarrow{+6} V$
- (b) HGFEDCBA
HGFEDCB
HGFEDC
H G FED
- (a) HGFEDCBA
GFEDCBA
FEDCBA
E DCBA
- (d) The series is: baa/bba/baa/bba/baa/bb
- (d) The series is: rtus/rtus/rtus/rtus.
- (b) The series is: ab/ab/ab/ab/ab/ab
- (b) The series is: abbc/ac/bcca/ba/caab/cb
- (a) The series is: acac/abab/acac/abab/acac
- (b) The series is: aabb/aaabbb/aaaabbbb/a.
- (d) The series is: abncb/abncb/abncb
- (b) The series is: ccc bbb aaa/ccc bbb aaa/c
- (a) The series is: bcaa/bcaa/bcaa/bcaa.
- (c) The series is: man/man/man/man/man.
- (a) The series is: mopn/mopn/mopn/mopn.
- (c) The series is: nmmm/nmmm/nmmm/nmmm.
- (d) The series is: abb/abb/abb/abb

23. (e) $J \xrightarrow{+1} 5 \xrightarrow{-3} 4$ $7 \xrightarrow{+1} W \xrightarrow{-3} I$
 $3 \xrightarrow{+1} 8 \xrightarrow{-3} M$ $2 \xrightarrow{+1} Y \xrightarrow{-3} 9$
 $8 \xrightarrow{+2} I \xrightarrow{-4} Q$

24. (c) Number — Vowel — Consonant

Such combinations are: 4 E J and 1 A M

25. (d) Consonant — Number — Vowel or Number

Such combinations are:

R 4 E, T 1 A, Q 3 8, D 9 U

26. (a) A is 8th from left and D is 20th from left. Exactly in their middle will be the 14th term, i.e. I.

27. (a) If all the numbers are removed, the arrangement becomes :

R E J T A M Q N I K W F D U Y V
↑
9th to left

Here T becomes 9th to the left of D.

28. (d) 6th to the left of 11th from the left means 5th from left. 5th from left \Rightarrow 5.

29. (b) 4th to the right of 10th from right means 6th from right. 6th from right is D.

30. (c) 3rd to the right of the 10th from the right means 7th from the right i.e., T.

31. (c)

Vowel	Number	Consonant
-------	--------	-----------

Such combinations are:

A9W

;

U1V

32. (e)

Not Vowel	Consonant	Number
-----------	-----------	--------

Such combinations are

JK4

;

3H5

;

RP6

;

9W8

;

VD7

33. (b) $J \xrightarrow{+1} K \xrightarrow{+1} 4$

$P \xrightarrow{-1} R \xrightarrow{-1} E$ (not +1)

$6 \xrightarrow{+1} N \xrightarrow{+1} A$

$8 \xrightarrow{+1} T \xrightarrow{+1} U$

$1 \xrightarrow{+1} V \xrightarrow{+1} D$

34. (a) $2 \xrightarrow{+4} 4 \xrightarrow{+4} E \xrightarrow{+4} N$

$J \xrightarrow{+4} H \xrightarrow{+4} P \xrightarrow{+4} 9$

35. (e) $J \xrightarrow{+1} 5 \xrightarrow{-3} 4$

$3 \xrightarrow{+1} 8 \xrightarrow{-3} E$

$7 \xrightarrow{+1} W \xrightarrow{-3} I$

$2 \xrightarrow{+1} Y \xrightarrow{-3} 9$

$8 \xrightarrow{-5} 1 \xrightarrow{+3} Q$ (not +1 & -3)

36. (c)

Number	Vowel	Consonant
--------	-------	-----------

Such combinations are :

4EJ, 1AM

37. (c)

Consonant	Number	Consonant
-----------	--------	-----------

J5T, K7W, F6S

38. (a) A is 8th from left and S is 20th from left. Exactly in their middle will be the 14th term, i.e. I.

39. (a) The series would be as follows :

O E J T A M Q N I K W F S U Y X

40. (d) Sixth to the left of eleventh from the left means 5th from the left. This is the number 5.

41. (b) Fourth to the of tenth from the right means 6th from the right. This is the consonant S.

42. (e)

VOWEL	SYMBOL
-------	--------

Such combinations are:

E★

,

A@

43. (c) $Q \xrightarrow{+4} M \xrightarrow{+4} @ \xrightarrow{+4} H$

$P \xrightarrow{+4} A \xrightarrow{+4} U \xrightarrow{+4} J$

$@ \xrightarrow{+4} H \xrightarrow{+4} Z \xrightarrow{+4} N$

44. (b) 8th to the right of 13th from the left means 21st from left. 21st from left \Rightarrow N

45. (d) RA@C

9

 UHW#

46. (a) There are 26 elements. After rearrangement, 13th element from the right will become 13th element from the left. Therefore, 10th from the left after rearrangement will be the 10th element from the right in the original sequence.

10th from right \Rightarrow Z

47. (e) $2 \xrightarrow{-3} 3 \xrightarrow{+4} \#$

$O \xrightarrow{-3} 1 \xrightarrow{+4} C$

$K \xrightarrow{-3} O \xrightarrow{+4} 5$

$\# \xrightarrow{-3} P \xrightarrow{+4} I$

$B \xrightarrow{-2} \$ \xrightarrow{-3} >$

48. (a) $P \xrightarrow{+3} \# \xrightarrow{+3} 7 \xrightarrow{+3} @ \xrightarrow{+3} D$

$R \xrightarrow{+3} L \xrightarrow{+3} I \xrightarrow{+3} O \xrightarrow{+3} K$

$J \xrightarrow{+3} 3 \xrightarrow{+3} 2 \xrightarrow{+3} N \xrightarrow{+3} C$

49. (c) 11th to the left of 16th from left means 5th from the left. But the sequence has been reversed. Therefore, required element will be 5th from right in the original sequence.

5th from right \Rightarrow B

50. (c) Such combination are:

R3P, N7O, K5D, Q4

51. (e)

Number	Symbol	Consonant
--------	--------	-----------

There is no such combination.

52. (c)

Consonant	Consonant	Number
-----------	-----------	--------

Some combinations are :

DF1

NP6

53. (d)

Letter	Number	Letter or Number
--------	--------	------------------

Such combinations are:

T4A

F1U

P6Q

54. (c)

Vowel	Symbol
-------	--------

Such combinations are:

U#

I©

55. (b) $R \xrightarrow{+2} T \xrightarrow{+2} A$
 $9 \xrightarrow{+2} D \xrightarrow{+1} F$ (not +2)
 $\# \xrightarrow{+2} @ \xrightarrow{+2} H$
 $3 \xrightarrow{+2} V \xrightarrow{+2} 5$
 $I \xrightarrow{+2} W \xrightarrow{+2} \star$
56. (a) Fourth to left of 12th from left means 8th from left.
 $7 \text{ R E T 4 A 9 \% D F}$
 $\underbrace{\hspace{10em}}_{\text{8th from left}}$
57. (e) New arrangement would be as follows:
 K S 4 V 7 P 2 6 M 9
 \therefore Fourth element is V in the new arrangement.
58. (a)

Letter	Symbol
--------	--------

 There is no such combination.
59. (e) Required symbols are : =, \star , © and \$
60. (d) Required numbers are: 3, 7, 4 and 5
61. (c) New arrangement would be as follows:
 6, C, F, 3, 8, \boxed{G} , L, M, 7, P, R, 4, \boxed{N} , T, 5, V
 13th element from left is N and 7th element to left of N is G
62. (b) New arrangement would be as follows:
 =, $\boxed{\text{£}}$, C, F, G, L, M, \star , @, \boxed{P} , R, ©, N, T, \$, V
 15th element from right is £ and 8th element to the right of £ is P.
63. (c) 9 and 2
64. (b) Third to left of thirteenth from the left means 10th from the left. The arrangement is
 $5 \text{ D H E 7 9 F I 6 R L 1 A J 3 B 4 K P 8 U M 2}$
 $\underbrace{\hspace{10em}}_{\text{10th from left}}$
65. (d) $E \xrightarrow{+3} 9 \xrightarrow{+3} I \xrightarrow{-3} \%$
 $D \xrightarrow{+3} \star \xrightarrow{+3} \$ \xrightarrow{+3} 6$
 $H \xrightarrow{+3} 7 \xrightarrow{-3} F \xrightarrow{+3} R$
66. (a) If all the numbers are removed, the arrangement becomes :
 D H E \star \$ F I R % L A J B # @ K P U M
 $\underbrace{\hspace{10em}}_{\text{9th from right}}$
 $\underbrace{\hspace{5em}}_{\text{5th to right}}$
 Here, 9th from right is 'A' and 5th to its right is 'K'.
67. (a) $972 \Rightarrow 792, 526 \Rightarrow 256,$
 $487 \Rightarrow 847, 359 \Rightarrow 539,$
 $251 \Rightarrow 521$
 $256 < 521 < 539 < 792 < 847$
68. (d) $9 + 7 + 2 + 2 = 20$ (multiple of 5)
 $5 + 2 + 6 + 2 = 15$ (multiple of 5)
 $4 + 8 + 7 + 2 = 21$
 $3 + 5 + 9 + 2 = 19$
 $2 + 5 + 1 + 2 = 10$ (multiple of 5)

69. (b) $972 - 1 = 971 = 17$ (prime), $526 - 1 = 525 = 12,$
 $487 - 1 = 486 = 18, 359 - 1 = 358 = 16,$
 $251 - 1 = 250 = 7$ (prime)
 17 and 7 are prime numbers.
70. (c) $972 \Rightarrow 279, 526 \Rightarrow 625,$
 $487 \Rightarrow 784, 359 \Rightarrow 953,$
 $251 \Rightarrow 152$
 $953 > 784 > 625$
71. (e) $972 \Rightarrow 297, 526 \Rightarrow 652,$
 $487 \Rightarrow 748, 359 \Rightarrow 935,$
 $251 \Rightarrow 125$
72. (b) 6th to right of 15th element from right means 9th element from right i.e., \star
73. (d) $I \xrightarrow{-3} \#, E \xrightarrow{-3} Q, 2 \xrightarrow{-3} \star$
 $\$ \xrightarrow{-2} 2, 5 \xrightarrow{-3} K$
74. (b) SYMBOL / LETTER — SYMBOL — NUMBER
 Such combination is only one:
 $\boxed{H \% 3}$
75. (a) There are only two symbols in the first 11 terms. Hence, required answer will be: 11th from left i.e., B
76. (c) $7 \xrightarrow{+3} 4 \xrightarrow{+3} B \xrightarrow{+3} R$
 $T \xrightarrow{+3} \# \xrightarrow{+3} I \xrightarrow{-3} 1$
 $3 \xrightarrow{+3} 4 \xrightarrow{+3} 6 \xrightarrow{+3} @$
77. (b) $\underbrace{\boxed{N}}_{-2} \cdot \underbrace{\boxed{T}}_{-3} \underbrace{\boxed{I}}_{-2} \underbrace{\boxed{B}}_{-2} \underbrace{\boxed{3}}_{-2} : \underbrace{\boxed{G}}_{-3} \underbrace{\boxed{4}}_{-3}$
 $\therefore \underbrace{\boxed{E}}_{-2} \underbrace{\boxed{B}}_{-3} : \underbrace{\boxed{\$}}_{-3} \underbrace{\boxed{8}}_{-3}$
78. (a) New arrangement would be as follows:
 $6 = @ 7 1 \text{ £ } 3 \star 4 \text{ © } 8 \$ 5 ? 2$
 In new arrangement, 11th element from right and 3rd element to right from 11th element is \star
79. (b) $P \xrightarrow{+1} = \xrightarrow{+2} 7 \xrightarrow{-5} 6$
 $\text{£} \xrightarrow{+2} T \xrightarrow{+1} 3 \xrightarrow{-5} 7$ (not +1, +1, -5)
 $3 \xrightarrow{+1} L \xrightarrow{+2} \star \xrightarrow{-5} R$
 $\text{©} \xrightarrow{+1} 8 \xrightarrow{+2} H \xrightarrow{-5} E$
 $5 \xrightarrow{+1} K \xrightarrow{+2} ? \xrightarrow{-5} H$
80. (d) New arrangement would be as follows:
 NP = @ £ RTLB \star E © GH\$KM ? DC
 In new arrangement, 3rd element from left is '=' and 15th element is '\$'. B is exactly between '=' and '\$'.
81. (c) 7 1 £
82. (c) New arrangement would be as follows:
 6 N P 7 1 R T 3 L B E 4 8 G H 5 K M 2 D C
 In new arrangement, 12th element from left is 4 and 4th element to its left 4 is 3.
83. (c) 5 7 3 4 6 2 9
 2 3 4 5 6 7 9
84. (a) $738 \Rightarrow 837; 495 \Rightarrow 594;$
 $329 \Rightarrow 923; 653 \Rightarrow 356;$
 $849 \Rightarrow 948$
 $356 < 594 < 837 < 923 < 948$
 \downarrow
 Third number

85. (e) $738 \Rightarrow 828$; $495 \Rightarrow 585$;
 $329 \Rightarrow 419$; $653 \Rightarrow 743$;
 $849 \Rightarrow 939$
 Greatest number $\Rightarrow 849 \Rightarrow 939$
86. (c) $738 \Rightarrow 378$; $495 \Rightarrow 945$;
 $329 \Rightarrow 239$; $653 \Rightarrow 563$;
 $849 \Rightarrow 489$
 Smallest number $\Rightarrow 239$
87. (c) $738 \Rightarrow 637$; $495 \Rightarrow 394$;
 $329 \Rightarrow 228$; $653 \Rightarrow 552$;
 $849 \Rightarrow 748$
 Now, interchanging second and third digits,
 $637 \Rightarrow 673$; $394 \Rightarrow 349$;
 $228 \Rightarrow 282$; $552 \Rightarrow 525$;
 $748 \Rightarrow 784$
 $282 < 349 < 525 < 673 < 784$
88. (b) According to question, numbers will be as follows:
 $737, 494, 328, 652, 848$
 $\therefore 848 > 737 > 652 > 494 > 328$
89. (c) $8 \begin{array}{|c|} \hline 3 \\ \hline \end{array} 1 \begin{array}{|c|} \hline 6 \\ \hline \end{array} 5$
 $1 \begin{array}{|c|} \hline 3 \\ \hline \end{array} 5 \begin{array}{|c|} \hline 6 \\ \hline \end{array} 8$
90. (b) 23, 234, 2345, 23456, 2345
91. (a) $634 > 5 \begin{array}{|c|} \hline 1 \\ \hline \end{array} 3 > 371$
92. (c) $165 < 248 < 37 \begin{array}{|c|} \hline 1 \\ \hline \end{array} < 513 < 634$
93. (b) $513 \Rightarrow 315$; $248 \Rightarrow 153$
 $371 \Rightarrow 173$; $634 \Rightarrow 364$;
 $167 \Rightarrow 617$
94. (a) $513 \Rightarrow 153$; $248 \Rightarrow 428$;
 $371 \Rightarrow 731$; $634 \Rightarrow 364$;
 $167 \Rightarrow 617$
95. (e) $1+6+7=14$
96. (d) $\begin{array}{|c|} \hline 7 \\ \hline \end{array} 3 \begin{array}{|c|} \hline 5 \\ \hline \end{array} 4 \begin{array}{|c|} \hline 6 \\ \hline \end{array} 1 \begin{array}{|c|} \hline 2 \\ \hline \end{array}$
 $\begin{array}{|c|} \hline 7 \\ \hline \end{array} 6 \begin{array}{|c|} \hline 5 \\ \hline \end{array} 4 \begin{array}{|c|} \hline 3 \\ \hline \end{array} 2 \begin{array}{|c|} \hline 1 \\ \hline \end{array}$
97. (a) Second smallest number = 317
 \therefore Middle digit = 1
98. (d) $7986032451 \Rightarrow 9768304215$
 fifth from right
99. (b) 2, 23, 234, 23456, 234567, 2345
100. (d) Given number = $5 \begin{array}{|c|} \hline 2 \\ \hline \end{array} \begin{array}{|c|} \hline 3 \\ \hline \end{array} 1 \begin{array}{|c|} \hline 6 \\ \hline \end{array} 9 \begin{array}{|c|} \hline 8 \\ \hline \end{array}$
 New arrangement = $1 \begin{array}{|c|} \hline 2 \\ \hline \end{array} \begin{array}{|c|} \hline 3 \\ \hline \end{array} 5 \begin{array}{|c|} \hline 6 \\ \hline \end{array} 8 \begin{array}{|c|} \hline 9 \\ \hline \end{array}$
101. (a) $567 \Rightarrow 568 \Rightarrow 865$
 $284 \Rightarrow 285 \Rightarrow 582$
 $696 \Rightarrow 697 \Rightarrow 796$
 $865 \Rightarrow 866 \Rightarrow 668$
 $738 \Rightarrow 739 \Rightarrow 937$
 $582 < 668 < 796 < 865 < 937$
102. (e) According to question, after interchanging of first two digits, numbers will be as follows:
 $320, 242, 238, 156, 318$
- Ascending order of the numbers will be as follows:
 $156, 238, 242, 318, 320$
103. (d) $5 \begin{array}{|c|} \hline 7 \\ \hline \end{array} 2 \begin{array}{|c|} \hline 6 \\ \hline \end{array} 4 \begin{array}{|c|} \hline 8 \\ \hline \end{array} \begin{array}{|c|} \hline 9 \\ \hline \end{array}$
 $2 \begin{array}{|c|} \hline 4 \\ \hline \end{array} 5 \begin{array}{|c|} \hline 6 \\ \hline \end{array} 7 \begin{array}{|c|} \hline 8 \\ \hline \end{array} \begin{array}{|c|} \hline 9 \\ \hline \end{array}$
104. (e) $9 \begin{array}{|c|} \hline 4 \\ \hline \end{array} 7 \begin{array}{|c|} \hline 8 \\ \hline \end{array} 6 \begin{array}{|c|} \hline 3 \\ \hline \end{array} 5 \begin{array}{|c|} \hline 1 \\ \hline \end{array} 2$
 $9 \begin{array}{|c|} \hline 8 \\ \hline \end{array} 7 \begin{array}{|c|} \hline 6 \\ \hline \end{array} 5 \begin{array}{|c|} \hline 4 \\ \hline \end{array} 3 \begin{array}{|c|} \hline 2 \\ \hline \end{array} 1$ (descending order)
 \therefore Required pairs are: 79, 12, 58 and 78
105. (c) $389 \Rightarrow 983$; $476 \Rightarrow 674$;
 $635 \Rightarrow 536$; $847 \Rightarrow 748$;
 $568 \Rightarrow 865$
106. (d) $839, 746, 365, 487, 658$
 $365 < 487 < 658$
107. (e) $7 \begin{array}{|c|} \hline 3 \\ \hline \end{array} \begin{array}{|c|} \hline 2 \\ \hline \end{array} \begin{array}{|c|} \hline 6 \\ \hline \end{array} \begin{array}{|c|} \hline 9 \\ \hline \end{array} \begin{array}{|c|} \hline 8 \\ \hline \end{array} 5$
 $2 \begin{array}{|c|} \hline 3 \\ \hline \end{array} 5 \begin{array}{|c|} \hline 6 \\ \hline \end{array} 7 \begin{array}{|c|} \hline 8 \\ \hline \end{array} 9$
 Required pairs are: 23, 89, 36, 68
108. (c) 545 and 545
109. (d) Original number : 52361984
 Ascending order : 12345689
 So, the position of 2, 3 and 8 remain unchanged
110. (c) Required sum = $1+7=8$
111. (c) Second highest number : 437
 Third digit = 7
112. (b) Number : 7524693
 Ascending order : 2345679
 So, the position of 6 remains the same.
113. (e) Number : 26839514
 Descending order : 98654321
 The position of all the digits changes.
114. (c) Original number : 3675249
 Changed number : 1953577
 So, 5 and 7 appear twice.
115. (c) Original number : 5831649
 Ascending order : 1345689
 So, the position of 6 and 9 remains the same.
116. (d) 3 6 9 12 15 18 21 24 (27) 30 33 36 39 42 45
117. (d) The first letter of each group moves + 1 step, second letter moves - 1 step and the third letter moves - 2 steps. Thus, the next group of letters would be roa.
118. (b) Original number : 53216894
 Changed number : 68945321
 So the second digit from the right end will be 2.
119. (b) Original number : 53147926
 Changed number : 97654321
 The only digit whose place is unchanged is 2. i.e. there is only one such number.



ALPHABET

CHAPTER

5

ALPHABET

Questions based on English alphabet are relatively easier and these questions may acquire different formats.

Some important tips for solving questions based on English alphabet:

- ❖ From your right implies from right to left.
- ❖ From your left implies left to right.
- ❖ To the right implies from left to right.
- ❖ To the left implies from right to left.
- ❖ If you have to find out a letter to the right of a certain letter counting from your right, you should apply the subtraction method.
- ❖ If you have to find out a letter to the right of a certain letter counting from your left you should apply the addition method.
- ❖ You should remember EJOTY, which helps in determining the position of other alphabets counting from your left. Each letter in the term EJOTY represents the position which is a multiple of 5. Thus.

E	J	O	T	Y
5	10	15	20	25
—————→				
from left to right.				

Types of Questions

- **Type I** Formation of words using the specified letters of a keyword.

ILLUSTRATION 1 : If it is possible to make only one meaningful word from the second, the fourth, the fifth, the seventh and the eleventh letters of the word 'DISTRIBUTION', third letter of that word is your answer. If more than one such word can be formed your answer is 'M' and if no such word can be formed your answer is 'X'.

- (a) B (b) I
(c) O (d) X
(e) M

Sol. (a) Order of letters is as follows :
1 2 3 4 5 6 7 8 9 10 11 12
D I S T R I B U T I O N
↓ ↓ ↓ ↓ ↓
I T R B O
⇒ O R **I** T

According to the question we obtain five letters I, T, R, B and 'O' which can form one meaningful word 'ORBIT'. The third letter of that word is 'B'.

Hence, required letter ⇒ B

- **Type II** Pointing out a pair of letters in a keyword which have as many letters between them in the word as in the alphabet.

ILLUSTRATION 2 : How many such pairs of letters are there in the word 'IDEAL' each of which has as many letters between them in the word as in the English alphabet ?

- (a) Nil (b) One
(c) Two (d) Four
(e) None of these

Sol. (b) $\overset{9}{I} \overset{4}{D} \overset{5}{E} \overset{1}{A} \overset{12}{L}$
I D E A L
⇒ DE

Here we observe that in the above word, only 'DE' is a letter pair each of which has as many letters between them in the word as in the English alphabet.

Hence, number of required letter pair ⇒ One

- **Type III** Arrangement of words in alphabetical order

ILLUSTRATION 3 : If two such letters are there in the word 'BOXES', each of which has as many letters between them in the word as in the English alphabet, then which letter will come first?

- (a) B (b) E
(c) S (d) O
(e) X

Sol. (a) $\textcircled{2} \text{---} \textcircled{5}$
B O X E S
⇒ B, E

[Here alphabet ordering value of both 'B' and 'E' are respectively '2' and '5']

Here, we observe in the above word only 'BE' is a letter pair each of which has as many letter between them in word as in the English alphabet. Among B and E, B come first.

Hence, required letter ⇒ B

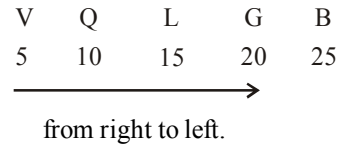
- **Type IV** Arrangement According to Dictionary

ILLUSTRATION 4 : Which of the following will be fourth if they are arranged alphabetically as in the dictionary?

- (a) Clever
- (b) Clam
- (c) Cloth
- (d) Custom
- (e) Cone

Similarly, the term VQLGB signifies the same arrangement in the reverse order of English alphabets.

Thus,



Sol. (e) According to dictionary, the order of words would be as follows:

Clam, Clever, Cloth, Cone, Custom

Points to Remember

- ❖ From your left means \Rightarrow from left to right. Hence, $(A \rightarrow Z)$ means from A to Z
- ❖ From your right means \Rightarrow from right to left. Hence, in alphabet $(A \leftarrow Z)$ means from Z to A

Alphabet	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Reverse alphabet	Z	Y	X	W	V	U	T	S	R	Q	P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A
Reverse Order	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

SOLVED EXAMPLES

EXAMPLE 1 : How many pairs of letters are there in the word FOREIGN, each of which has as many letters between them as there are between them in the English alphabet?

- (a) Two
- (b) Nil
- (c) One
- (d) Three
- (e) More than three

EXAMPLE 3 : How many meaningful English words can be made with all the letters ERTU using each letter only once in each word?

- (a) None
- (b) One
- (c) Two
- (d) Three
- (e) More than three

Sol. (b) Meaningful word is: TRUE

Sol. (a) F O R E I G N



EXAMPLE 2 : If in the English Alphabet each consonant is substituted by the immediate preceding letter and each vowel is substituted by the immediate following letter, then the word CAPITALISE will be written as:

- (a) BBOJSBMJRF
- (b) BBOJSBKJRD
- (c) BBQJSBKJRF
- (d) BBOJSBKJRF
- (e) None of these

EXAMPLE 4 : If it is possible to make only one meaningful English word with the third, the seventh, the eighth and the tenth letters of the word PREDICAMENT, which of the following will be the third letter of that word? If no such word can be made, give 'X' as the answer and if more than one such word can be made, give 'Y' as the answer.

- (a) M
- (b) N
- (c) E
- (d) X
- (e) Y

Sol. (e) Third, the seventh, the eighth and the tenth letters of the word PREDICAMENT are E, A, M and N respectively. Meaningful words are: MEAN, NAME and MANE.

Sol. (d)

C	A	P	I	T	A	L	I	S	E
-1↓	+1↓	-1↓	+1↓	-1↓	+1↓	-1↓	+1↓	-1↓	+1↓
B	B	O	J	S	B	K	J	R	F

EXERCISE

1. How many such pairs of letters are there in the word STRIVE each of which has as many letters between them in the word as in the English alphabet ?
- (a) One (b) Two
(c) Three (d) Four
(e) None of these
2. How many meaningful English words can be formed with the letters 'ATN' using each letter only once in each word?
- (l) One (b) Two
(c) Three (d) Four
(e) More than four
3. The serial order of how many letters in the word CLIENT will not differ than their serial order in the arrangement where the letters of the word are arranged alphabetically?
- (a) Four (b) One
(c) Three (d) Two
(e) None of these
4. If the letters of the word HANDOVER are arranged alphabetically from left to right, how many letters will remain at the same position?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
5. How many such pairs of letters are there in the word EXCURSION, each of which has as many letters between them in the word as they have in the English alphabet?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
6. If it is possible to make only one meaningful word from the second, the third, the sixth and the eighth letters of the word DEVIATION, the first letter of the meaningful word is your answer. If more than one such word can be formed your answer is 'A' and if no such word can be formed your answer is 'B'.
- (a) V (b) T
(c) E (d) A
(e) B
7. If each alternate letter beginning with the first in the word WORKING is replaced by the next letter in the English alphabet and each of the remaining letters is replaced by the previous letter in the English alphabet, which of the following will be the fourth from the right end after the replacement?
- (a) N (b) Q
(c) J (d) M
(e) None of these
8. How many such pairs of letters are there in the word GOLDEN, each of which has as many letters between them in the word as in the English alphabet?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
9. Select the combination of numbers so that letters arranged accordingly will form a meaningful word.
- R A C E T
1 2 3 4 5
- (a) 1, 2, 3, 4, 5 (b) 3, 2, 1, 5, 4
(c) 5, 2, 3, 4, 1 (d) 5, 1, 2, 3, 4
(e) 5, 3, 2, 4, 1
10. How many meaningful English words can be made with the letters ENAL using each letter only once in each word?
- (a) One (b) Two
(c) Three (d) Four
(e) More than four
11. If all the letters in the word ARGUMENT are rearranged in alphabetical order and substituted by the letter immediately following it in the English alphabet, what will be the new arrangement of letters?
- (a) BFHNOSUV (b) BFHONSWV
(c) BFHNOUSV (d) BFHNOQUV
(e) None of these
12. How many pairs of letters are there in the word DELUSION which have as many letters between them in the word as there are in the English alphabet?
- (l) None (b) One
(c) Two (d) Three
(e) None of these
13. How many three - letter meaningful words can be formed from the word TEAR beginning with 'A' without repeating any letter within that word?
- (a) One (b) Three
(c) Five (d) Two
(e) None of these

14. If the letters of the word ARROGANCE are interchanged, first with fifth, second with sixth, third with seventh, fourth with eighth and the position of the ninth remains unchanged, then what will the new arrangement of letters be?
- (a) GANACRROE (b) GANCRAROE"
(c) GNACORRAE (d) GANCARROE
(e) None of these
15. How many such pairs of letters are there in the word 'CHILDREN' each of which has as many letters between them in the word as there are between them in the English alphabet ?
- (a) 3 (b) 5
(c) 4 (d) 2
(e) None of these
16. If it is possible to make a meaningful word with the third, the fifth, the seventh and the tenth letters of the word OUTRAGEOUS, which of the following will be the second letter of that word? If more than one such word can be formed, give 'X' as the answer and if no such word can be formed, give 'Y' as the answer.
- (a) E (b) A
(c) S (d) Y
(e) X
17. If all the letters in the word 'PRINCE' are rearranged in alphabetical order, then how many letter(s) will remain unchanged?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
18. How many meaningful English words can be formed with ESRO using each letter only once in each word?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
19. How many such pairs of letters are there in the word CONSTABLE, each of which has as many letters between them in the word as in the English alphabet?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
20. How many meaningful words can be made from the letters ACER using each letter only once?
- (a) NIL (b) One
(c) Two (d) Three
(e) More than three
21. In the word FLOURISH, all the vowels are first arranged alphabetically and then all the consonants are arranged alphabetically and then all the vowels are replaced by the previous letter and all the consonants are replaced by the next letter from the English alphabet. Which letter will be third from the right end?
- (a) I (b) S
(c) M (d) V
(e) None of these
22. How many such pairs of letters are there in the word PHYSICAL, each of which has as many letters between them in the word as they have in the English alphabet?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
23. How many pairs of letters are there in the word 'SHIFTED' each of which has as many letters between its two letters as there are between them in the English alphabet?
- (a) None (c) One
(c) Two (d) Three
(e) None of these
24. How many meaningful English words can be formed by using any two letters of the word 'GOT'?
- (a) Three (b) Two
(c) One (d) More than three
(e) None of these
25. How many such pairs of letters are there in the word KNIGHT, each of which has as many letters between them in the word as they have in the English alphabet?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
26. If in the word STABLE all the consonants are replaced by the previous letter and all the vowels are replaced by the next letter, which letter will be third from the left end ?
- (a) S (b) B
(c) A (d) K
(e) None of these
27. How many meaningful words can be made from the letters AEHT, using each letter only once?
- (a) None (b) One
(c) Two (d) Three
(e) More than three

28. If it is possible to make a meaningful word from the second, the third, the tenth and the eleventh letters of the word PASSIONATELY using each letter only once, second letter of that word is your answer. If no such word can be formed your answer is X and if more than one word can be formed your answer is Y.
- (a) A (b) E
(c) L (d) X
(e) Y
29. How many three-letter meaningful English words can be formed from the word NOTE beginning with T and without repeating any letter within that word?
- (a) Three (b) One
(c) Two (d) None
(e) None of these
30. If the letters of the word OBSERVANT are interchanged, such that the first becomes ninth, second becomes eighth, and so on and the position of the fifth letter remains unchanged, then what will be the new arrangement of letters?
- (a) TNAVERSBO (b) TNYARESBO
(c) NTAVERSBO (d) VANTRESBO
(e) None of these
31. How many pairs of letters are there in the word ANSWER, each of which has as many letters between them in the word as there are in the English language?
- (a) One (b) Two
(c) Four (d) Three
(e) None of these
32. If all the letters in the word MERCIFUL are rearranged in alphabetical order and substituted by the alphabet preceding them in the English alphabet, what will be the new arrangement of letters?
- (a) BDFIEKLQI (b) BDEHKLQT
(c) BDEHLKQT (d) BDEJMLQT
(e) None of these
33. If in the word CERTIFICATE, the first and the seventh letters are interchanged, similarly the second and the eighth letters are interchanged and so on up to the fifth and eleventh letters are interchanged, then which letter will be third to the right of sixth from the right end?
- (a) T (b) R
(c) A (d) C
(e) None of these
34. How many such pairs of letters are there in the word DOCUMENT, each of which has as many letters between them in the word as in the English alphabet ?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
35. If it is possible to make only one meaningful word, from the first, the third, the fifth and the eighth letters of word ENTERPRISE using each letter only once, first letter of the word is your answer. If more than one such word can be made your answer is 'X' and if no such word can be made, your answer is 'Y'.
- (a) P (b) S
(c) T (d) X
(e) Y
36. If in the word DISTANCE all the vowels are replaced by the next letter and all the consonants are replaced by the previous letter and then all the letters are arranged alphabetically, which letter will be third from the right?
- (a) M (b) P
(c) R (d) J
(e) None of these
37. After arranging the letters of the word FOLK in alphabetical order, if each letter is substituted by the letter immediately preceding to it in the English alphabet, what will be the resultant form of the word?
- (a) GLMP (b) EJKP
(c) EKJN (d) EJKN
(e) None of these
38. If A is denoted by 1, B by 2, C by 3, D by 1, E by 2, F by 3 and so on, what would be the sum of the digits for the word MULE ?
- (a) 7 (b) 8
(c) 9 (d) 10
(e) None of these
39. What will come in place of question mark (?) in the following letter-group series based on English alphabet ?
WC RE NI KO ?
- (a) JX (b) JW
(c) IX (d) IW
(e) None of these
40. How many meaningful English words can be made with the letters ARTSE using each letter only once in each word?
- (a) None (b) One
(c) Two (d) Three
(e) More than three

41. How many such pairs of letters are there in the word PROFITABLE, each of which has as many letters between them in the word as in the English alphabet?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
42. How many such pairs of letters are there in the word ELEVATION, each of which have as many letters between them in the word as they have between them in the English alphabet?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
43. If each vowel of the word WEBPAGE is substituted with the next letter of the English alphabet, and each consonant is substituted with the letter preceding it, which of the following letters will appear thrice?
- (a) G (b) F
(c) Q (d) V
(e) None of these
44. How many such pairs of letters are there in the word DOCUMENTARY, each of which has as many letters between them in the word as there are between them in the English alphabet?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
45. How many meaningful four letter English words can be formed with the letters TPSI using each letter only once in each word?
- (a) One (b) Two
(c) Three (d) Four
(e) More than four
46. How many such pairs of letters are there in the word HORIZONTAL, each of which has as many letters between them in the word as they have between them in the English alphabetic?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
47. How many meaningful five-letter words can be formed with the letters SLIKL using each letter only once ?
- (a) One (b) Two
(c) Three (d) More than three
(e) None
48. If each vowel in the word HABITUAL is changed to the next letter in the English alphabet and each consonant is changed to the previous letter in the English alphabet, which of the following will be fourth from the left ?
- (a) A (b) S
(c) J (d) H
(e) None of these
49. Which of the following groups of alphabets should replace the blank spaces so that the group of alphabets, given in bold, follow a logical pattern from the preceding and the following group of alphabets ?
- bw __ yza d stuv __ opqre**
- (a) x, e, d (b) x, c, f
(c) v, e, f (d) x, c, d
(e) x, e, n
50. The positions of how many alphabets will remain unchanged if each of the alphabets in the word WALKING is arranged in alphabetical order from left to right ?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
51. How many such pairs of letters are there in the word REGIONAL, each of which has as many letters between them in the word as they have between them in the English alphabet?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
52. If it is possible to make only one meaningful word with the first, fifth, ninth and the tenth letters of the word 'AUTOMOBILE', which would be the second letter of the word from the right? If more than one such word can be formed, give 'Y' as the answer. If no such word can be formed, give 'Z' as your answer.
- (a) Y (b) L
(c) A (d) E
(e) Z
53. How many such pairs of letters are there in the word CORPORATE, each of which has as many letters in the same sequence between them in the word as in the english alphabet ?
- (a) Four (b) One
(c) Two (d) Three
(e) None of these

54. If the first three letters of the word COMPREHENSION are reversed, then the last three letters are added and then the remaining letters are reversed and added, then which letter will be exactly in the middle ?
- (a) H (b) N
(c) R (d) S
(e) None of these
55. If the first and second letters in the word DEPRESSION were interchanged, also the third and the fourth letters, the fifth and the sixth letters and so on, which of the following would be the seventh letter from the right ?
- (a) R (b) O
(c) S (d) P
(e) None of these
56. If the positions of the third and tenth letters of the word DOCUMENTATION are interchanged, and likewise the positions of the fourth and seventh letters, the second and sixth letters, which of the following will be eleventh from the right end ?
- (a) C (b) I
(c) T (d) U
(e) None of these
57. Arrange the given words in alphabetical order. Which one comes in the middle?
- (a) Restrict (b) Rocket
(c) Robber (d) Random
(e) Restaurant

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ANSWER KEY

1	(a)	13	(b)	25	(c)	37	(d)	49	(b)
2	(b)	14	(d)	26	(b)	38	(c)	50	(c)
3	(a)	15	(c)	27	(c)	39	(d)	51	(e)
4	(a)	16	(e)	28	(e)	40	(e)	52	(a)
5	(e)	17	(c)	29	(a)	41	(c)	53	(c)
6	(d)	18	(e)	30	(e)	42	(e)	54	(d)
7	(c)	19	(d)	31	(b)	43	(b)	55	(d)
8	(c)	20	(d)	32	(b)	44	(c)	56	(c)
9	(d)	21	(c)	33	(b)	45	(c)	57	(a)
10	(c)	22	(c)	34	(a)	46	(e)		
11	(a)	23	(d)	35	(d)	47	(b)		
12	(e)	24	(b)	36	(a)	48	(c)		

ANSWERS & EXPLANATIONS

1. (a) $\overline{\text{STRIVE}}$
2. (b) Meaningful words are : TAN and ANT
3. (a)

C	L	I	E	N	T
C	E	I	L	N	T
4. (a) H A N D O V E R
A D E H N O R V
None will remain in the same position.
5. (e) $\overline{\text{EXCURSION}}$
6. (d) 1 2 3 4 5 6 7 8 9
D E V I A T I O N
Second, Third, Sixth and Eighth letters are E, V, T and O.
Meaningful words are: VETO, VOTE
7. (c)

W	O	R	K	I	N	G
+1	-1	+1	-1	+1	-1	+1
↓	↓	↓	↓	↓	↓	↓
X	N	S	J	J	M	H
			↑ fourth from right			
8. (c) $\overline{\text{GOLDEN}}$
9. (d) 5, 1, 2, 3, 4 ; word 'TRACE'.
10. (c) ELAN, LEAN and LANE
11. (a) Given word : A R G U M E N T
Alphabetically the sequence is

A	E	G	M	N	R	T	U
↓ ⁻¹	↓ ⁻¹	↓ ⁻¹	↓ ⁻¹	↓ ⁻¹	↓ ⁻¹	↓ ⁻¹	↓ ⁻¹
B	F	H	N	O	S	U	V
12. (e) $\overline{\text{DELUSSION}}$
13. (b) Meaningful words are : ARE, ART, ATE
14. (d) New order of letters : GANCARROE
15. (c) $\overline{\text{CHILDREN}}$
Required pairs of letters
= HI, EI, HN and IN
16. (e) O U $\overline{\text{T}}$ R $\overline{\text{A}}$ G $\overline{\text{E}}$ O U $\overline{\text{S}}$
1 2 3 4 5 6 7 8 9 10
From letters T, A, E and S, meaningful words are SEAT, and EAST.
17. (c) According to english alphabet, resultant group will be as follows:

P	R	I	N	C	E
C	E	I	N	P	R

 Only two letters 'I and N' will remain unchanged.
18. (e) Meaningful words are : ROSE, SORE, EROS and ORES.

19. (d) $\begin{matrix} 3 & 15 & 14 & 19 & 20 & 1 & 2 & 12 & 5 \\ C & O & N & S & T & A & B & L & E \end{matrix}$

20. (d) Meaningful word are : RACE, CARE and ACRE.

21. (c) According to the question

$\begin{matrix} F & L & O & U & R & I & S & H \\ & & \downarrow & & & & & \\ I & O & U & F & H & L & R & S \\ & & \downarrow & & & & & \\ I & O & U & F & H & L & R & S \\ -1\downarrow & -1\downarrow & -1\downarrow & +1\downarrow & +1\downarrow & +1\downarrow & +1\downarrow & +1\downarrow \\ H & N & T & G & I & M & S & T \end{matrix}$
 3rd from right

22. (c) $\begin{matrix} P & H & Y & S & I & C & A & L \end{matrix}$

23. (d) $\begin{matrix} S & H & I & F & T & E & D \end{matrix}$

24. (b) Meaningful words are : GO and TO

25. (c) $\begin{matrix} K & N & I & G & H & T \end{matrix}$

26. (b) $\begin{matrix} S & T & A & B & L & E \\ \downarrow -1 & \downarrow -1 & \downarrow +1 & \downarrow -1 & \downarrow -1 & \downarrow +1 \\ R & S & B & A & K & F \end{matrix}$
 3rd from left

27. (c) Meaningful words are : HATE and HEAT

28. (e) Meaningful words are : SEAL and SALE

29. (a) Meaningful words are : TON, TOE, TEN

30. (e) $\begin{matrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ O & B & S & E & R & V & A & N & T \end{matrix}$
 $\begin{matrix} T & N & A & V & R & E & S & B & O \end{matrix}$

31. (b) $\begin{matrix} 1 & 14 & 19 & 23 & 5 & 18 \\ A & N & S & W & E & R \end{matrix}$

32. (b) According to order of alphabet

$\begin{matrix} C & E & F & I & L & M & R & U \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ B & D & E & H & K & L & Q & T \end{matrix}$

33. (b) According to question,

third to the right of F
 $\begin{matrix} I & C & A & T & E & F & C & E & R & T & I \end{matrix}$
 sixth from right

34. (a) 4 15 3 21 13 5 14 20
 D O C U M E N T

35. (d) Meaningful word are : TIRE, TIER and RITE.

36. (a) $\begin{matrix} D & I & S & T & A & N & C & E \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ C & J & R & S & B & M & B & F \end{matrix}$
 B B C F J **M** R S

37. (d) FOLK → FKLO → EJKN

38. (c) MULE = 1 + 3 + 3 + 2 = 9

39. (d) $W \xrightarrow{-5} R \xrightarrow{-4} N \xrightarrow{-3} K \xrightarrow{-2} I$
 $C \xrightarrow{+2} E \xrightarrow{+4} I \xrightarrow{+6} O \xrightarrow{+8} W$

40. (e) Meaningful words are : TEARS, STARE, RATES and ASTER.

41. (c) $\begin{matrix} P & R & O & F & I & T & A & B & L & E \end{matrix}$

So, there are two pairs : A, B and B, F.

42. (e) $\begin{matrix} E & L & E & V & A & T & I & O & N \end{matrix}$

So, there are four pairs : EA, EI, VT, ON

43. (b) Word: WEBPAGE

Changed word :

VFAOBFF

So, F appears thrice.

44. (c) $\begin{matrix} D & O & C & U & M & E & N & T & A & R & Y \end{matrix}$

So, there are two pairs : MR and TR

45. (c) Words : TIPS, SPIT and PITS.

46. (e) $\begin{matrix} H & O & R & I & Z & O & N & T & A & L \end{matrix}$

So, there are four pairs :

HN, RO, RN, ON

47. (b) SKILL, KILLS

48. (c) Original word :

HABITUAL

Changed word :

GBAJSVBK

So, fourth from the left is J.

49. (b) $\begin{matrix} b & w & x & y & z & a \\ d & s & t & u & v & c \\ f & o & p & q & r & e \end{matrix}$

50. (c) Word :
WALKING
Alphabetical order :
A G I K L N W
So, the positions of K and N remain unchanged.

51. (e) R E G I O N A L



So, there are four pairs :
GL, ON, NL and OL

52. (a) Letters :
A, M, L, E
Words : MALE, MEAL, LAME

53. (c) C O R P O R A T E



Three pairs — (P, R), (R, T) and (P, O) have as many letters between them in the word as in the English alphabet. But since the letters must be in the same sequence in the word as in the English alphabet, so the desired pairs are (P, R) and (R, T) only.

54. (d) Clearly, we have :
COMPREHENSION → (COM)(PREHENS)(ION)
→ MOCIONSNEHERP

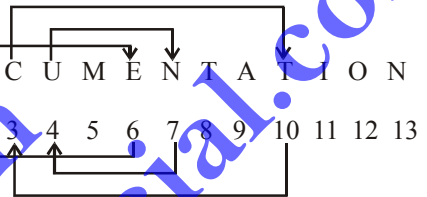
The middle letter is the seventh letter, which is S.

55. (d)

↶	↶	↶							
D	E	P	R	E	S	S	I	O	N
E	D	R	P	S	E	I	S	N	O
1	2	3	4	5	6	7	8	9	10
↷	↷	↷							

56. (c)

D O C U M E N T A T I O N



57. (a) Random, Restaurant, **Restrict**, Robber, Rocket.

58. (d) 5, 1, 2, 3, 4; word 'TRACE'.



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BLOOD RELATION

CHAPTER

6

BLOOD RELATION

Questions based on blood relationships are very common in bank exams. In these type of questions, a roundabout description is given in the form of certain small relationships and direct relationship between the persons concerned is to be deciphered. Questions based on Blood Relation may appear confusing but easier to answer if we break the questions into parts and analyze it with the help of a diagram.

Representation of one generation to the next

1st generation	Grandfather, Grandmother
2nd generation	Mother, Father, uncle, aunty
3rd generation	Self, Sister, Brother & Brother/Sister-in-law
4th generation	Son, Daughter, nephew, niece

Points to Remember

MEMORABLE FACTS ABOUT BLOOD RELATIONS

❖ My mother's or father's son	⇒ my Brother.
❖ My mother's or father's daughter	⇒ my Sister.
❖ My mother's or father's father	⇒ my Grandfather.
❖ My mother's or father's sister	⇒ my Aunt.
❖ My mother's or father's brother	⇒ my Uncle.
❖ My son's wife	⇒ my daughter-in-law.
❖ My daughter's husband	⇒ my Son-in-law.
❖ My brother's son	⇒ my Nephew.
❖ My brother's daughter	⇒ my Niece.
❖ My sister's husband	⇒ my brother-in-law.
❖ My brother's wife	⇒ my Sister-in-law.
❖ My husband's or wife's sister	⇒ my Sister-in-law.
❖ My husband's or wife's brother	⇒ my Brother-in-law.
❖ My uncle's or aunt's son or daughter	⇒ my Cousin.
❖ My wife's father or husband's father	⇒ my Father-in-law.
❖ My wife's mother or husband's mother	⇒ my Mother-in-law.
❖ My father's wife	⇒ my Mother.
❖ My mother's husband	⇒ my Father.
❖ My son's or daughter's son	⇒ my Grandson.
❖ My son's or daughter's daughter	⇒ my Granddaughter.

Types of Questions

► Type I Questions based on Coded Relation

ILLUSTRATION 1 : If $A + B$ means A is the mother of B; $A \times B$ means A is the father of B; $A \$ B$ means A is the brother of B and $A @ B$ means A is the sister of B, then which of the following means P is the son of Q?

- (a) $Q + R @ P @ N$ (b) $Q + R * P @ N$
 (c) $Q \times R \$ P @ N$ (d) $Q + R \$ P \$ N$

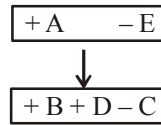
Sol. (d)

- $Q + R = Q$ is the mother of R
- $R \$ P = R$ is the brother of P
- $P \$ N = P$ is the brother of N
Therefore P is the son of Q.

► Type II Questions based on Relationship of Family

ILLUSTRATION 2 : A has 3 children. B is the brother of C and C is the sister of D, E who is the wife of A is the mother of D. There is only one daughter of the husband of E. What is the relation between D and B?

Sol. With the chart



Therefore, D is a boy because there is only one daughter of E

Hence, B is the brother of D.

► Type III Find the direct relation from indirect statements

ILLUSTRATION 3 : Pointing to a photograph, Rekha says to Lalli, "The girl in the photo is the second daughter of the wife of the only son of the grandmother of my younger sister." How is this girl of photograph is related to Rekha?

Explanation by direct method:

- Grandmother of younger sister of Rekha is Grandmother of Rekha
- Wife of only son of grandmother is Mother of Rekha
- Younger daughter of the mother is Younger sister of Rekha.

Note: While solving the question (+) can be used for male and (-) can be used for female.

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SOLVED EXAMPLES

EXAMPLE 1: P is the brother of Q. M is sister of Q. T is brother of P. How is Q related to T?

- (a) Brother (b) Sister
(c) Brother or Sister (d) Data inadequate
(e) None of these

Sol. (c) T and P are the brothers of Q.
Sex of Q is not given.

Hence, Q is either brother or sister of T.

EXAMPLE 2: Pointing to a boy, Seema said "He is the son of my grandfather's only child". How is boy related to Seema?

- (a) Brother (b) Cousin
(c) Sister (d) Data inadequate
(e) None of these

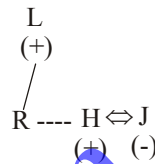
Sol. (a) Only child of Seema's Grandfather means Seema's mother or Seema's father.

Hence, that boy is Seema's brother.

EXAMPLE 3: If 'A × B' means 'B is father of A', 'A + B' means 'A is wife of B' and 'A ÷ B' means 'A is brother of B', then, what is the relation of J with L in 'J + H ÷ R × L'?

- (a) Daughter (b) Daughter-in-law
(c) Sister-in-law (d) Cannot be determined
(e) None of these

Sol. (b)



J is R's brother's wife. L is the father of H and R.

∴ J is daughter-in-law of L.

EXERCISE

Directions (Q. 1-5): Following questions are based on the information provided below:

'A × B' means 'A is mother of B'.

'A – B' means 'A is brother of B'.

'A + B' means 'A is sister of B'.

'A ÷ B' means 'A is father of B'.

1. Which of the following means 'R' is maternal uncle of 'T'?

- (a) $R - M \times T$ (b) $R + M \times T$
(c) $T \times M - R$ (d) $T + M \div R$
(e) None of these

2. Which of the following means 'F' is paternal grandfather of 'H'?

- (a) $F - J \div H$ (b) $F \div J - H$
(c) $F \div J \div H$ (d) $H \div J \div F$
(e) None of these

3. How is K related to M in $R \div M - K$?

- (a) Son (b) Daughter
(c) Nephew (d) Cannot be determined
(e) None of these

4. How will 'M is daughter of N' be written?

- (a) $M + D \times N$ (b) $N \div M + W$
(c) $N \div M$ (d) $N \times M$
(e) None of these

5. How is 'H' related to D in ' $D \div R - M \times H$ '?

- (a) Grandson
(b) Granddaughter
(c) Grandson or Granddaughter
(d) Data inadequate (e) None of these

6. Deepika tells Shraddha "Your mother's father's son is the husband of my sister." How is Deepika related to Shraddha?

- (a) Sister-in-law (b) Cousin.
(c) Aunt (d) Data inadequate
(e) None of these

7. D is A's son. C is the mother of P and wife of D. How is A related to C?

- (a) Father (b) Uncle
(c) Father-in-law (d) Data inadequate
(e) None of these

8. Pointing to the lady in the photograph, Mrinalini said, "Her son's father is the only son-in-law of my mother". How is Mrinalini related to the - lady?
- (a) Sister (b) Mother
(c) Cousin (d) Aunt
(e) None of these
9. If 'A ★ B' means 'A is the father of B', 'A × B' means 'A is the mother of B' and 'A # B' means 'A is the husband of B', then which of following means P is the grandson of Q?
- (a) $Q \# R \times S \star P$ (b) $Q \star N \times P \# R$
(c) $Q \star L \# N \times P$ (d) $P \# N \times M \star Q$
(e) None of these
10. A is brother of R. C is mother of B. M is sister of C. How is M related to B?
- (a) Nephew (b) Niece
(c) Aunt (d) Cannot be determined
(e) None of these
11. R is the daughter of Q. M is the sister of B who is the son of Q. How M is related to R?
- (a) Cousin (b) Niece
(c) Sister (d) Aunt
(e) None of these
12. Pointing to a photograph Nikita said 'She is the only granddaughter of my grandmother's daughter'. How is the girl in photograph related to Nikita ?
- (a) Sister (b) Niece/daughter
(c) Aunt (d) Cannot be Determined
(e) None of these
13. If 'P × Q' means 'P is wife of Q', 'P + Q' means 'P is father of Q' and 'P ÷ Q' means 'P is sister of Q' then in $G \times H + R \div D$, how is G related to D?
- (a) Cannot be determined (b) Mother
(c) Niece (d) Aunt
(e) None of these
14. Pointing to a photograph of Hari, Vijay said, "The father of his sister is the husband of my wife's mother". How is Vijay related to Hari?
- (a) Brother (b) Brother-in-law
(c) Uncle (d) Data inadequate
(e) None of these
15. M is N's brother. S is D's mother and M's aunt. How is D related to M?
- (a) Sister (b) Cousin
(c) Aunt (d) Cannot be determined
(e) None of these
16. Pointing to a photograph, Sachin said "She is the grandmother of my father's sister's son". How is the woman in the photograph related to Sachin ?
- (a) Mother (b) Aunt
(c) Cousin (d) Cannot be determined
(e) None of these
17. P is father of J. S is mother of N who is brother of J. B is son of S. C is sister of B. How J is related to C?
- (a) Data inadequate (b) Cousin
(c) Brother (d) Sister
(e) None of these

Directions (Q. 18-19) : Study the following information carefully to answer these questions.

- (i) 'P × Q' means 'P is brother of Q'
(ii) 'P - Q' means 'P is sister of Q'.
(iii) 'P + Q' means 'P is mother of Q'
(iv) 'P ÷ Q' means 'P is father of Q'
18. Which of the following means 'M is daughter of R'?
- (a) $R \div D \times M$ (b) $R + D \times M$
(c) $M - J \times R + T$ (d) $R + M - T$
(e) None of these
19. Which of the following means 'K is maternal uncle of W'?
- (a) $K - J + W$ (b) $K \times J \div W$
(c) $K \times J + W$ (d) $W + J \times K$
(e) None of these

Directions (Q. 20-25) : These questions are based on the following information. Study it carefully and answer the questions.

- (i) 'A × B' means 'A is father of B'.
(ii) 'A ÷ B' means 'A is daughter of B'.
(iii) 'A + B' means 'A is sister of B'.
(iv) 'A - B' means 'A is husband of B'.
20. Which of the following indicates 'N is mother of K'?
- (a) $K + L \div N \times F$ (b) $K + L \div N - M$
(c) $H \times K \div N$ (d) $N \times F + K$
(e) None of these
21. In $F \div R \times H - L$, how is H related to F?
- (a) Father (b) Brother
(c) Sister (d) Cannot be determined
(e) None of these
22. In $G \times T + Q \div M$, how is M related to G?
- (a) Brother (b) Sister
(c) Sister-in-law (d) Cannot be determined
(e) None of these

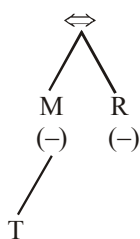
23. In $F - R + H \div T$, how is F related to T?
 (a) Son-in-law (b) Daughter-in-law
 (c) Son (d) Daughter
 (e) None of these
24. D is brother of B. M is brother of B. K is father of M. T is wife of K. How is B related to T?
 (a) Son (b) Daughter
 (c) Son or Daughter (d) Data inadequate
 (e) None of these
25. Pointing to a woman, Nirmal said, "She is the daughter of my wife's grandfather's only child". How is the woman related to Nirmal?
 (a) Wife (b) Sister-in-law
 (c) Sister (d) Data inadequate
 (e) None of these
26. X told Y, "Though I am the son of your father, you are not my brother". How is X related to Y?
 (a) Sister (b) Son
 (c) Daughter (d) Father
 (e) None of these
27. Introducing Rajesh, Neha said, his brother's father is the only son of my grandfather. How is Neha related to Rajesh?
 (a) Daughter (b) Sister
 (c) Mother (d) Niece
 (e) None of these
28. Pointing to a photograph, Arun said, 'She is the mother of my brother's son's wife's daughter.' How is Arun related to the lady?
 (a) Uncle (b) Daughter-in-law
 (c) Cousin (d) Brother
 (e) None of these
29. A boy goes to see a film and finds a man who is his relative. The man is the husband of the sister of his mother. How is the man related to the boy?
 (a) Brother (b) Nephew
 (c) Uncle (d) Father
 (e) None of these
30. Lakshmi and Meena were Rohan's wives, Shalini is Meena's step-daughter. How was Lakshmi related to Shalini?
 (a) Sister (b) Mother-in-Law
 (c) Mother (d) Step-mother
 (e) None of these
31. Daya has a brother, Anil. Daya is the son of Chandra. Bimal is Chandra's father. In terms of relationship, what is Anil of Bimal?
 (a) Son (b) Grandson
 (c) Brother (d) Grandfather
 (e) None of these
- Direction (Q. 32-34) :** Study the following information carefully to answer these questions.
- (i) ' $P \times Q$ ' means 'P is brother of Q'
 (ii) ' $P - Q$ ' means 'P is sister of Q'
 (iii) ' $P + Q$ ' means 'P is father of Q'.
 (iv) ' $P \div Q$ ' means 'P is mother of Q'.
32. Which of the following represents 'M is nephew of N' ?
 (a) $N - K + M$ (b) $N \times K \div M$
 (c) $N \div K \times M$ (d) $N - K + M \times T$
 (e) None of these
33. How is T related to D in the expression :
 $H + T \div R - D$?
 (a) Nephew (b) Niece
 (c) Nephew or Niece (d) Data inadequate
 (e) None of these
34. Which of the following represents F is daughter of W?
 (a) $W \div R + F$ (b) $W \times R \times F$
 (c) $W + R \times F - T$ (d) $W + R - F + T$
 (e) None of these

ANSWER KEY

1	(a)	8	(e)	15	(b)	22	(e)	29	(c)
2	(c)	9	(b)	16	(e)	23	(a)	30	(c)
3	(d)	10	(c)	17	(a)	24	(c)	31	(b)
4	(b)	11	(c)	18	(d)	25	(d)	32	(d)
5	(c)	12	(b)	19	(c)	26	(a)	33	(e)
6	(c)	13	(b)	20	(c)	27	(b)	34	(c)
7	(d)	14	(b)	21	(b)	28	(a)		

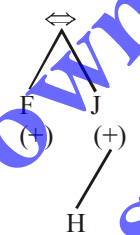
ANSWERS & EXPLANATIONS

1. (a) $R - M \times T$:

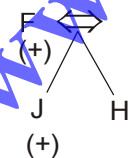


Hence, R is the maternal uncle of T.

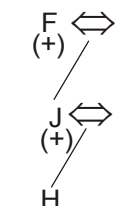
2. (c) I. $F - J \div H$:



II. $F \div J \div H$:

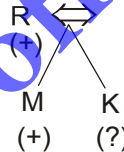


III. $F \div J \div H$:



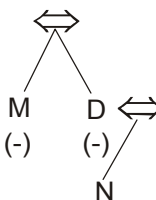
Hence, F is the paternal grandfather of H.

3. (d) $R \div M - K$:

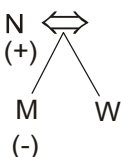


Sex of K is not clear

4. (b) I. $M + D \times N$

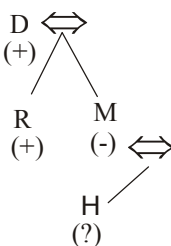


II. $N \div M + W$



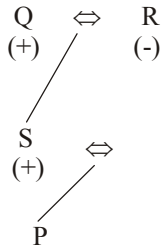
Hence, M is the daughter of N.

5. (c) $D \div R - M \times H$:



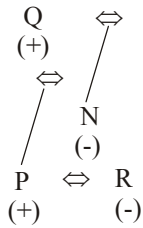
The gender of H is unknown, therefore H may be grand son or granddaughter of D.

6. (c) Shraddha's mother's father's son \Rightarrow Shraddha's maternal uncle. Shraddha's maternal uncle is husband of Deepika's sister. Deepika is 'aunt' of Shraddha.
7. (d) C is the wife of D and D is the son of A. Hence, A is either father-in-law or mother-in-law of C.
8. (e) Photograph is of Mrinalini.
9. (a) $Q \# R \times S \star P$:



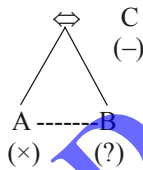
The gender of P is unknown, therefore 'P is grandson of Q' is not true

- (b) $Q \star N \times P \# R$:



(Here, the gender of P is known, therefore 'P is grandson of Q').

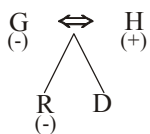
10. (c) According to question,



From above diagram it is clear that M is the aunt of B.

11. (c) $R \xleftarrow{\text{daughter}} Q \xrightarrow{\text{son}} B \xrightarrow{\text{sister}} M$
 $\therefore M, R$'s sister.

12. (b)
13. (b) From given information,

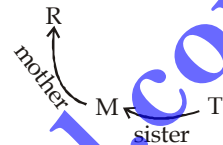


Hence, G is the mother of D.

14. (b) The father of his sister is the husband of Vijay's wife's mother means Vijay's mother-in-law and mother-in-law's daughter's brother means Vijay's brother-in-law.
15. (b) S, is D's mother and M's aunty. Therefore, D is M's cousin.
16. (e) The lady is the grandmother of Sachin's father's sister's son. Hence, she is Sachin's grandmother.
17. (a) $P(+)$ \Leftrightarrow $S(-)$
 $J - N(+)$ $B(+)$ - $C(-)$

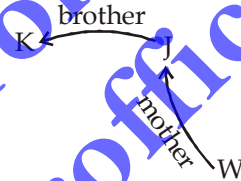
The gender of J is unknown, therefore J may be brother or sister of C.

18. (d)



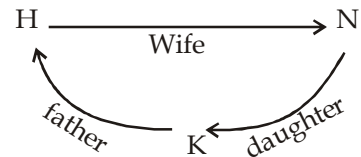
So, M is daughter of R.

19. (c)



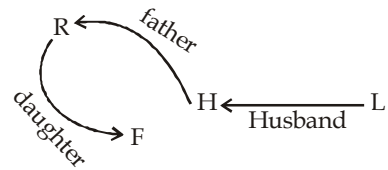
So, K is maternal uncle of W.

20. (e)



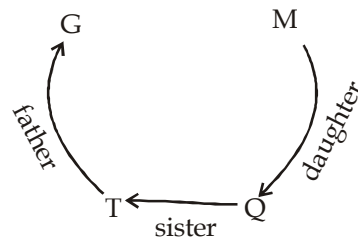
So, N is wife of H and mother of K.

21. (b)

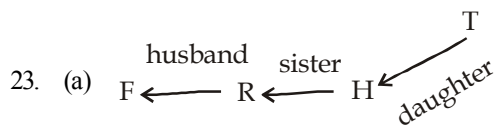


So, H is brother of F.

22. (e)

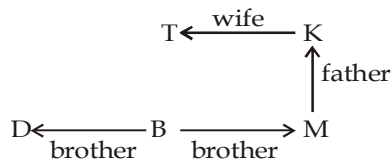


So, M is wife of G.



So, F is son-in-law of T.

24. (c)



So, B is either son or daughter of T.

25. (d) Grandfather's only child means either father or mother. So the woman is either Nirmal's wife or sister - in - law.

26. (a) As X is the son of Y's father and Y is the sister of X he has to be the brother of Y.

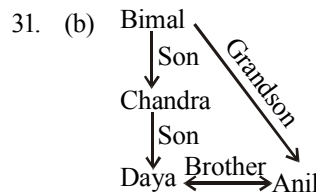
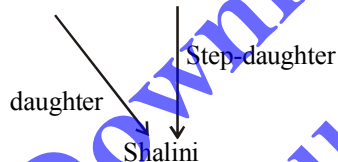
27. (b) Neha is the sister (because Rajesh's grandfather is the same as Neha's).

28. (a) One's brother's son's wife's daughter implies paternal grand-daughter of one's brother. Now, the mother of paternal grand-daughter of one's brother implies wife of one's nephew.

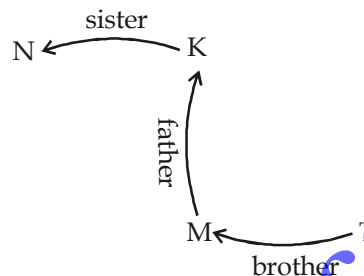
Thus, we can conclude that Arun is the paternal uncle of the female's husband.

29. (c) The sister of one's mother is one's maternal aunt. Hence the man is the husband of the boy's maternal aunt.

30. (c) Rohit + Lakshmi & Meena

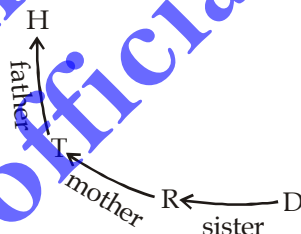


32. (d)



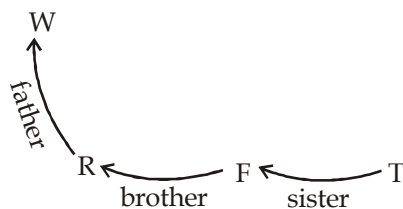
So, M is nephew of N

33. (e)



So, T is mother of D.

34. (c)



So, F is daughter of W.

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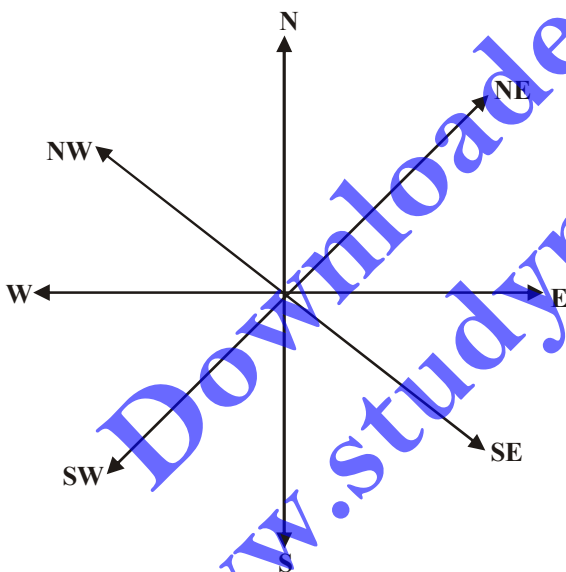
DIRECTION SENSE & CALENDAR TEST

CHAPTER 7

DIRECTION SENSE

In this part, the questions consist of a sort of direction puzzle and the candidates are required to ascertain the final direction or the distance between the two points. The test is meant to judge the candidate's ability to trace and follow the direction correctly.

The adjoining diagram shows the four main directions (North N, South S, East E, and West W) and the four cardinal directions (North-East NE, North-West NW, South-East SE, and South-West SW). Candidates should memorize the same.



How to solve the problems

The easiest way of solving these problems is to draw a diagram as you read information about the problem and let the diagram reflect all the information given in the problem. To solve these types of problems, the student should know the directions properly without any confusion.

Points to Remember

- ❖ At the time of sunrise if a man stands facing the east, his shadow will be towards west, i.e. behind him.
- ❖ At the time of sunset the shadow of an object is always to the east.
- ❖ If a man stands facing the North, at the time of sunrise his shadow will be towards his left and at the time of sunset it will be towards his right.
- ❖ At 12:00 noon, the rays of the sun are vertically downward and hence there will be no shadow.
- ❖ The shortest distance from a particular point after travelling a distance of x metres in the horizontal direction and a distance of y metres in the vertical direction is equal to $\sqrt{x^2 + y^2}$.

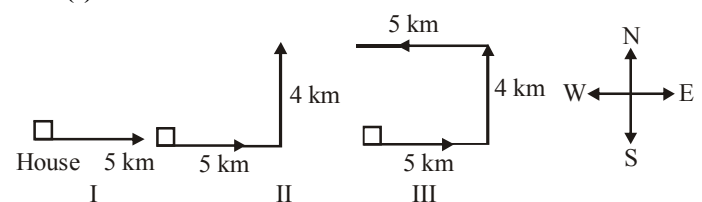
Types of Questions

► Type I

ILLUSTRATION ► 1 : Siva, starting from his house, goes 5 km in the East, then he turns to his left and goes 4 km. Finally he turns to his left and goes 5 km. Now how far is he from his house and in what direction?

- (a) In East, at a distance of 5 km
- (b) In East, at a distance of 4 km
- (c) In West, at a distance of 4 km
- (d) In North, at a distance of 4 km
- (e) None of these

Sol. (d)

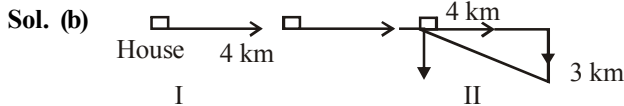


From third position it is clear he is at 4 km from his house and is in North direction.

► **Type II**

ILLUSTRATION 2 : Suresh, starting from his house, goes 4 km in the East, then he turns to his right and goes 3 km. What minimum distance will be covered by him to come back to his house?

- (a) 4 km
- (b) 5 km
- (c) 6 km
- (d) 7 km
- (e) None of these



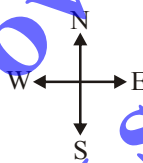
$$\begin{aligned} \text{Minimum distance} &= \sqrt{(4)^2 + (3)^2} \\ &= \sqrt{16+9} \\ &= \sqrt{25} \\ &= 5 \text{ km.} \end{aligned}$$

► **Type III**

ILLUSTRATION 3 : One morning just after sunrise Juhi, while going to school, met Lalli at Boring Road crossing. Lalli's shadow was exactly to the right of Juhi. If they were face to face, which direction was Juhi facing?

- (a) East
- (b) North East
- (c) West
- (d) South
- (e) None of these

Sol. (d) In the morning the sun rises in the east.

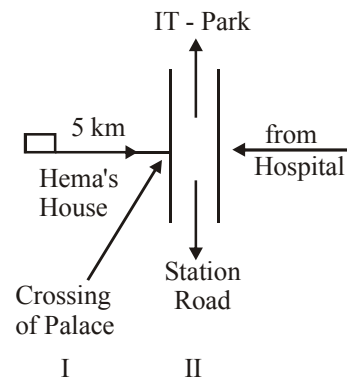


So in the morning the shadow falls towards the west. Now Lalli's shadow falls to the right of the Juhi. Hence Juhi is facing South.

► **Type IV**

ILLUSTRATION 4 : Hema, starting from her house, walked 5 km to reach the crossing of Palace. The direction in which she was going, a road opposite to that direction goes to Hospital. The road to the right goes to the station. If the road which goes to the station is just opposite to the road which goes to the IT-Park, then in which direction to Hema is the road which goes to the IT-Park?

Sol.



From II it is clear that the road which goes to IT-Park is to the left to Hema.

CLOCK AND CALENDAR

- ❖ The solar year consists of 365 days, 5 hrs 48 minutes, 48 seconds.
In 47 BC, Julius Caesar arranged a calendar known as the Julian calendar in which a year was taken as $365\frac{1}{4}$ days and in order to get rid of the odd quarter of a day, an extra day was added once in every fourth year and this was called as a leap year.
- ❖ In an ordinary year,
1 year = 365 days = 52 weeks + 1 day
In a leap year,
1 year = 366 days = 52 weeks + 2 days
- NOTE :** First January 1 A.D. was Monday.
To find a particular day corresponding to a particular date, the number of odd days upto that date should be computed and if no. of odd days is
0 odd day stands for Sunday
1 odd day stands for Monday
2 odd day stands for Tuesday
3 odd day stands for Wednesday
4 odd day stands for Thursday
5 odd day stands for Friday
6 odd day stands for Saturday
- ❖ A clock has two hands : Hour hand and Minute hand. The minute hand (M.H.) is also called the long hand and the hour hand (H.H.) is also called the short hand.
- ❖ The clock has 12 hours numbered from 1 to 12. Also, the clock is divided into 60 equal minute divisions. Therefore, each hour number is separated by five minute divisions. Therefore,
- ❖ Two One minute divisions = $\frac{360}{60} = 6^\circ$ apart. ie. In one minute, the minute hand moves 6° .

- ❖ Two One hour divisions = $6^\circ \times 5 = 30^\circ$ apart. i.e. In one hour, the hour hand moves 30° .

Also, in one minute, the hour hand moves = $\frac{30^\circ}{60} = \frac{1^\circ}{2}$.

- ❖ Since in one minute, the minute hand moves 6° and hour hand moves $\frac{1^\circ}{2}$, therefore, in one minute, the minute hand gains $5\frac{1}{2}$ over the hour hand.

- ❖ In one hour, the minute hand gains $5\frac{1}{2} \times 60 = 330^\circ$ over the hour hand. i.e. the minute hand gains 55 minute divisions over the hour hand.

- ❖ The position of the M.H. relative to the H.H. is said to be the same, whenever the M.H. is separated from the H.H. by the same number of minute divisions and is on the same side (clockwise or anticlockwise) of the H.H. Any relative position of the hands of a clock is repeated 11 times in every 12 hours.

- ❖ When both hands are 15 minute spaces apart, they are at a right angle. When they are 30 minute spaces apart, they point in opposite directions.

The hands are in the same straight line when they are coincident or opposite to each other.

- ❖ In every hour, both the hands coincide once.
 - In a day, the hands are coinciding 22 times.
 - In every 12 hours, the hands of a clock coincide 11 times.
 - In every 12 hours, the hands of a clock are in opposite direction 11 times.
 - In every 12 hours, the hands of clock are at right angles 22 times.

- In every hour, the two hands are at right angles 2 times.
- In every hour, the two hands are in opposite directions once.
- In a day, the two hands are at right angles 44 times.

- ❖ If both the hands coincide, then they will again coincide after $65\frac{5}{11}$ minutes. i.e. in a correct clock, both hands coincide at an interval of $65\frac{5}{11}$ minutes.

- ❖ If the two hands coincide in time less than $65\frac{5}{11}$ minutes, then the clock is running too fast and if the two hands coincide in time more than $65\frac{5}{11}$ minutes, then the clock is running too slowly.

- ❖ If a clock indicates 6 : 10, when the correct time is 6 : 00, it is said to be 10 minutes too fast and if it indicates 5 : 50 when the correct time is 6 : 00, it is said to be 10 minutes too slow.

- ❖ Also, if both hands coincide at an interval of x minutes and

$$x < 65\frac{5}{11}, \text{ then total time gained} = \left(\frac{65\frac{5}{11} - x}{x} \right) \text{ minutes}$$

and clock is said to be 'fast'.

- ❖ If both hands coincide at an interval of x minutes and

$$x > 65\frac{5}{11}, \text{ then total time lost} = \left(\frac{x - 65\frac{5}{11}}{x} \right) \text{ minutes and}$$

clock is said to be 'slow'.

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SOLVED EXAMPLES

EXAMPLE 1: This year, Balu's birthday is on 27th January i.e. Wednesday. Balu remembers that Mohan's birthday is exactly on the fifth Friday after his birthday. How much younger is Mohan than Balu?

- (a) Data inadequate (b) By 30 days
(c) By 3 days (d) By 29 days
(e) None of these

Sol. (b) First Friday will be two days after Wednesday.
Total number of days = $2 + (7 \times 4) = 30$ days

EXAMPLE 2: Shailesh saw the movie on Monday. Nitin saw the movie two days prior to Vikas but three days after Shailesh. On which day did Vikas see the movie?

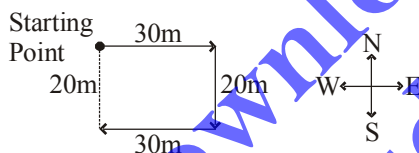
- (a) Monday (b) Saturday
(c) Tuesday (d) Sunday
(e) None of these

Sol. (b) Nitin saw the film on Monday + 3 = Thursday Vikas saw the film on Thursday + 2 = Saturday

EXAMPLE 3: Pravin walked 30 metres towards East, took a right turn and walked 20 metres, again took a right turn and walked 30 metres. How far was he from the starting point?

- (a) 30 metres (b) 80 metres
(c) 50 metres (d) 20 metres
(e) None of these

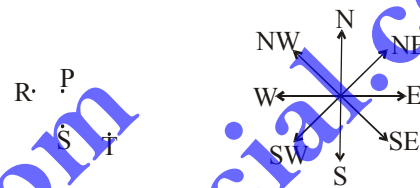
Sol. (d) Diagram of Pravin walking direction is as follows:



EXAMPLE 4: R is to the West of P. T is to the East of S. P is to the north of S. T is in which direction with reference to R?

- (a) West (b) East
(c) North (d) South
(e) None of these

Sol. (e) According to question,



Hence, T is in south-east direction with respect to R

EXAMPLE 5: If the third day of a month is Tuesday, which of the following would be the 4th day before the 27th day of that month?

- (a) Tuesday (b) Monday
(c) Wednesday (d) Sunday
(e) None of these.

Sol. (b) If the third day of a month is Tuesday, then 27th of that month will be Friday and 4th day before the 27th day of that month will be Monday.

EXERCISE

- Sushil lives to the North of Rajesh who lives to the West of Kamlesh. Arun, who lives to the South of Sushil, has his house in which direction with respect to Kamlesh?

(a) North-West (b) North
(c) South-West (d) Cannot be determined
(e) None of these
- Sachin and Vinod want to visit the museum after their exams. Sachin's exams finish on 9th April and he is leaving for a holiday on 12th April. Vinod's exams will be over by 10th April after which he is free. On which of the following dates can the two definitely meet?

(a) 10th April (b) Either 10th or 11th April
(c) 12th April (d) Either 11th or 12th April
(e) None of these
- If the digits of a watch are replaced by every alternate letter of the alphabet beginning from 12 in the reverse order, i.e., 12 replaced by A, 11 replaced by C and so on, then on which alphabet would the small hand be when the time is 5.00 P.M. ?

(a) P (b) N
(c) M (d) Q
(e) None of these
- Ram is facing South. Ramesh, walking towards him, stops, and turns to his right. He sees Umesh standing before him facing him. Which direction is Umesh facing?

(a) West (b) South
(c) East (d) Data inadequate
(e) None of these

5. Satish read a book on Sunday. Sudha read that book one day prior to Anil but 4 days after Satish. On which day did Anil read the book?
- (a) Friday (b) Thursday
(c) Tuesday (d) Saturday
(e) None of these
6. In a row of children facing north, Manish is fourth to the left of Suresh, who is tenth from the left end. Nisha is second to the right of Suresh and eighth from the right end of the row. Total how many children are there in the row?
- (a) 19 (b) 20
(c) 21 (d) 18
(e) None of these
7. Rupa and Saroj want to attend a seminar together between 9 am and 5 pm on Friday. Saroj cannot leave till after her lunch break which begins at 1.30 pm. Rupa is free after her meeting which begins at noon. For how many hours can the two of them attend the seminar?
- (a) 3½ hours (b) 2½ hours
(c) 4½ hours (d) Cannot be determined
(e) None of these
8. Saroj started walking straight, facing West. After walking some distance she took a left turn and again after walking some distance she took a left turn. Which direction is she facing now?
- (a) West (b) North
(c) East (d) South
(e) Cannot be determined
9. Raman starts from point P and walks towards South and stops at point Q. He now takes a right turn followed by a left turn and stops at point R. He finally takes a left turn and stops at point S. If he walks 5 Kms before taking each turn, towards which direction will Raman have to walk from point S to reach point Q?
- (a) North (b) South
(c) West (d) East
(e) North-West
10. Among six friends L, M, N, P, Q and S, each having a different height, N is taller than Q and P but shorter than M. P is taller than only Q while S is shorter only than L. Which of the following pairs represents the tallest and the shortest among the six friends?
- (a) M, P (b) L, Q
(c) P, Q (d) Cannot be determined
(e) None of these
11. Nitin correctly remembers that Nidhi's birthday is before Friday but after Tuesday. Derek correctly remembers that Nidhi's birthday is after Wednesday but before Saturday. On which of the following days does Nidhi's birthday definitely fall?
- (a) Monday (b) Tuesday
(c) Wednesday (d) Thursday
(e) Cannot be determined

Directions (Q. 12-13) : Study the following information to answer the given questions:

Point B is 12 meters south of point A. Point C is 24 meters east of point B. Point D is 8 meters south of point C. Point D is 12 meters east of point E and point F is 8 meters north of point E.

12. If a man has to travel to point E from Point A (through these points by the shortest distance), which of the following points will he pass through first ?
- (a) Point C (b) Point D
(c) Point F (d) Point B
(e) None
13. If a man is standing facing north at point C, how far and in which direction is point F ?
- (a) 12 meters west (b) 24 meters east
(c) 12 meters east (d) 24 meters west
(e) None of these

Directions (Q. 14-16) : Study the following information carefully and answer the given questions.

Point D is 14 m towards the West of point A. Point B is 4 m towards the South of point D. Point F is 9 m towards the South of point D. Point E is 7 m towards the East of point B. Point C is 4 m towards the North of point E. Point G is 4 m towards the South of point A.

14. Which of the following points are in a straight line ?
- (a) D, E, A (b) E, G, C
(c) D, B, G (d) E, G, B
(e) F, B, C
15. A is in which direction with respect to C ?
- (a) East (b) West
(c) North (d) South
(e) Cannot be determined
16. If a person walks 5 m towards North from point F and then takes a right turn, which of the following points would he reach first ?
- (a) G (b) D
(c) E (d) A
(e) C
17. A directional post is erected on a crossing. In an accident, it was turned in such a way that the arrow which was first showing east is now showing south. A passerby went in a wrong direction thinking it is west. In which direction is he actually travelling now ?
- (a) North (b) South
(c) East (d) West
(e) None of these

18. Q walked 20 metres towards West, took a left turn and walked 20 metres. He then took a right turn and walked 20 metres and again took a right turn and walked 20 metres. How far is Q now from the starting point?
- (a) 40 metres (b) 50 metres
(c) 80 metres (d) Data inadequate
(e) None of these
19. Mohan correctly remembers that his father's birthday is before twentieth January but after sixteenth January whereas his sister correctly remembers that their father's birthday is after eighteenth January but before twenty-third January. On which date in January is definitely their father's birthday?
- (a) Eighteenth (b) Nineteenth
(c) Twentieth (d) Data inadequate
(e) None of these
20. A postman was returning to the Post Office which was in front of him to the north. When the Post Office was 100 metres away from him, he turned to the left and moved 50 metres to deliver the last letter at Shanti Villa. He then moved in the same direction for 40 metres, turned to his right and moved 100 metres. How many metres away was he now from the Post Office?
- (a) 0 metre (b) 150 metre
(c) 90 metre (d) 100 metre
(e) None of these
21. A clock gaining 2 minutes every hour was synchronised at midnight with a clock losing 1 minutes every hour. How many minutes behind will its minute hand be at eleven the following morning compared to the clock gaining 2 minutes every hour?
- (a) 23 (b) 27
(c) 22 (d) 33
(e) None of these
22. Five boys are standing in a row facing East. Deepak is to the left of Sameer, Tushar and Shailendra. Sameer, Tushar and Shailendra are to the left of Sushil. Shailendra is between Sameer and Tushar. If Tushar is fourth from the left, then how far is Sameer from the right?
- (a) First (b) Second
(c) Third (d) Fourth
(e) None of these
23. Laxman went 15 km to the west from my house, then turned left and walked 20 km. He then turned East and walked 25 km and finally turning left, covered 20 km. How far was he from my house?
- (a) 5km (b) 10 km
(c) 40km (d) 80 km
(e) None of these
24. Reaching the place of meeting on Tuesday 15 minutes before 8.30 hours, Anuj found himself half an hour earlier than the man who was 40 minutes late. What was the scheduled time of the meeting?
- (a) 8.00 hrs (b) 8.05 hrs
(c) 8.15 hrs (d) 8.45 hrs
(e) None of these
25. Kailash faces towards north. Turning to his right, he walks 25 metres. He then turns to his left and walks 30 metres. Next, he moves 25 metres to his right. He then turns to his right again and walks 55 metres. Finally, he turns to the right and moves 40 metres. In which direction is he now from his starting point?
- (a) South-West (b) South
(c) North-West (d) South-East
(e) None of these
26. From a point, Rajneesh started walking towards east and walked 35 m. He then turned towards his right and walked 20 m and he again turned right and walked 35 m. Finally he turned to his left and walked 20 m and he reached his destination. Now, how far is he from his starting point?
- (a) 55 m (b) 50 m
(c) 20 m (d) 40 m
(e) None of these
27. Rama remembers that she met her brother on Saturday, which was after the 20th day of a particular month. If the 1st day of that month was Tuesday, then on which date did Rama meet her brother?
- (a) 24th (b) 23rd
(c) 25th (d) 26th
(e) None of these
28. Ram walks 10m South from his house, turns left and walks 23 m, again turns left and walks 40 m, then turns right and walks 5 m to reach his school. In which direction is the school from his house?
- (a) East (b) North-East
(c) South-West (d) North
(e) None of these

ANSWER KEY

1	(d)	7	(d)	13	(a)	19	(b)	25	(d)
2	(b)	8	(c)	14	(d)	20	(c)	26	(d)
3	(e)	9	(a)	15	(a)	21	(d)	27	(d)
4	(a)	10	(b)	16	(c)	22	(d)	28	(b)
5	(a)	11	(d)	17	(b)	23	(b)		
6	(a)	12	(c)	18	(a)	24	(b)		

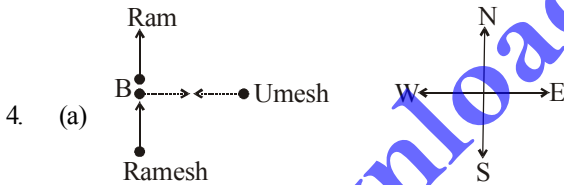
ANSWERS & EXPLANATIONS

1. (d)
 • Sushil
 • Arun
 • Rajesh
 • Arun
 • Kamlesh

The position of Arun is not clear (it may be North-West or South-West).

2. (b) Sachin and Vinod can meet on 10th or 11th April.
 3. (e) If 12 is replaced by A, 11 is replaced by C, then 5 would be replaced by O.

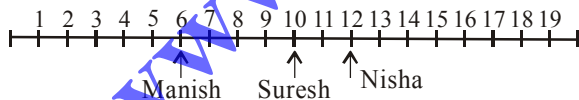
Hence, the small hand would be at O



Hence, Umesh is facing West

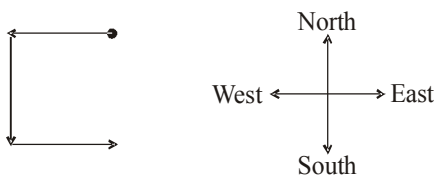
5. (a) Satish → Sunday
 Sudha → Thursday
 Anil → Friday
 Hence, Anil read the book on Friday

6. (a) The children are standing like this

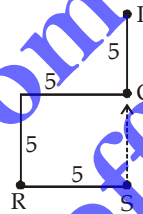


7. (d) Since duration of lunch of Saroj and timing to end of meeting is not given, answer cannot be determined.

8. (c)



9. (a)



So, Raman will have to walk in North direction to reach point Q from point S.

10. (b) Ascending order of height : QPNMSL

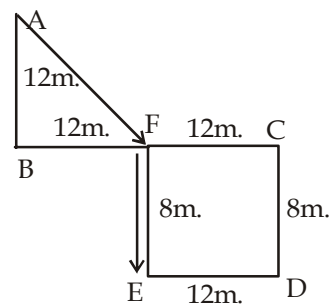
So, L and Q are the tallest and the shortest respectively.

11. (d) According to Nitin ⇒ Wednesday or Thursday

According to Derek ⇒ Thursday or Friday

So, Nidhi's birthday falls on Thursday

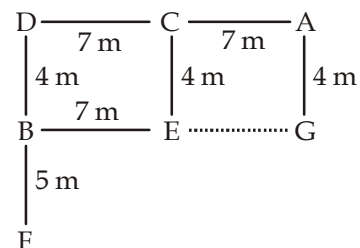
Sol. (12-13):



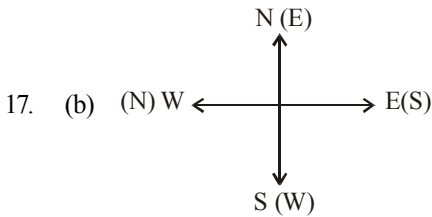
12. (c) See arrows in diagram above.

13. (a)

Sol. (14-16):



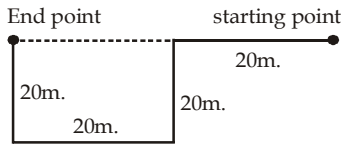
14. (d) Points B, E, G and A, C, D are in a straight line.
 15. (a) A is towards East of C.
 16. (c) He would reach first at point 'E'.



When the arrow turns, East becomes South, North becomes East, West becomes North and South becomes West.

So the traveller must be actually travelling in the South direction thinking it is West.

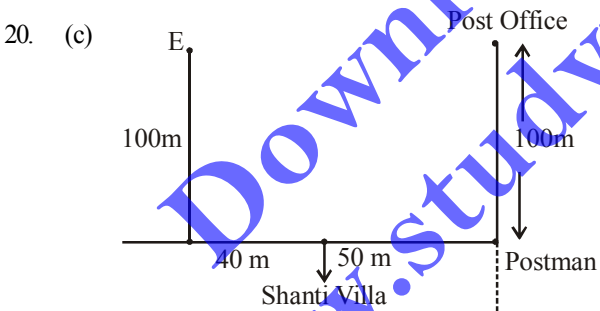
18. (a) \therefore Distance from starting point = $20 + 20 = 40$ m



19. (b) According to Mohan \Rightarrow 17, 18 or 19

According to Mohan's sister \Rightarrow 19, 20, 21 or 22

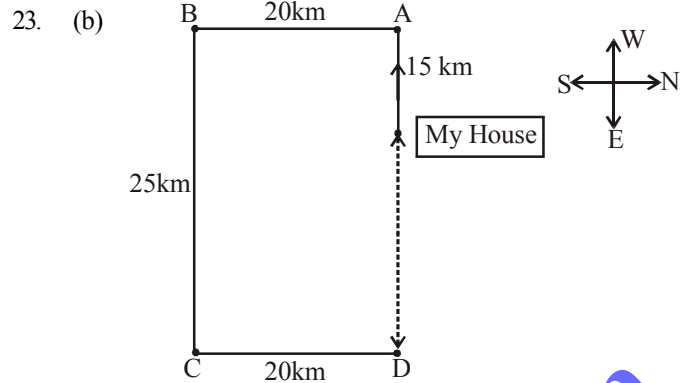
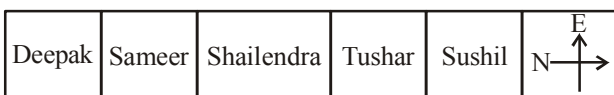
Hence, birthday of their father is on 19 January.



From the diagram, E is the final point where postman has reached. Hence his distance from the post office = $40 + 50 = 90$ m.

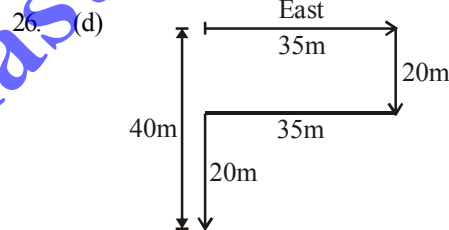
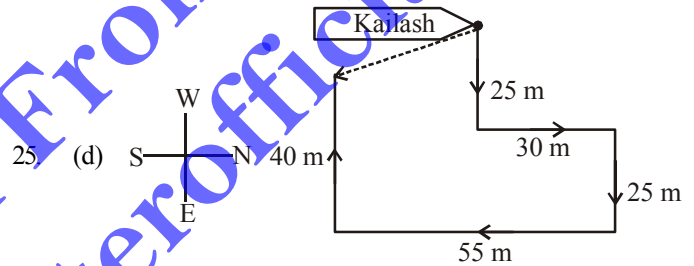
21. (d) First clock will gain 11×2 minutes in 11 hrs., and second clock will lose 11×1 minutes in 11 hrs. Hence difference will be 33 minutes.

22. (d) The boys are standing as follows from L \rightarrow R



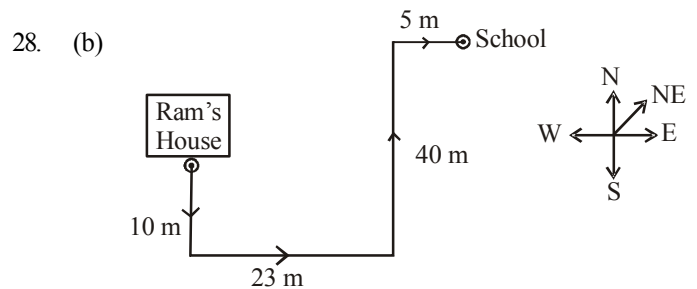
From the above diagram, required distance = $25 - 15 = 10$ km.

24. (b) Anuj reached at 8 : 15 AM
 Time when the other man came = $8:15 + 0:30 = 8:45$ AM (who was 40 minutes late)
 \therefore scheduled time of meeting = $8:45 - 0:40 = 8:05$



From the above diagram Total distance from the starting point = $20 + 20 = 40$ m.

27. (d) 1st of the month was Tuesday, hence the date on first Saturday was 5th. Hence the other Saturdays of the month are 12, 19, 26. Rama met her brother on 26th.



Hence, the school of Ram is to the north-east from his house.

RANKING AND ORDERING TEST

CHAPTER 8

RANKING AND ORDERING TEST

The position of a thing/person etc. in a definite order is called as 'Rank'.

In this type of test, relative position or rank of some person or object is given and candidates are required to find the rank or position of other person or object.

Types of Questions

► Type I Rank of a person in a queue

- ❖ Position of person from upward
= [Total no. of persons – position of person from down] + 1.
- ❖ Position of person from downward
= [Total no. of persons – position of person from up] + 1.
- ❖ Position of person from right
= [Total no. of persons – position of person from left] + 1.
- ❖ Position of person from left
= [Total no. of persons – position of person from right] + 1.

EXAMPLE ► 1: Anita ranks twelfth in a class of forty six. What will be her rank from the last?

- (a) 34th (b) 35th
(c) 36th (d) 37th
(e) None of these

Sol. (b) Rank of Anita from the last
= [Total students – her rank from first] + 1
= (46 – 12) + 1 = 35th.

EXAMPLE ► 2: Ravi is 7 ranks ahead of Sumit in a class of 39. If Sumit's rank is 17th from the last, what is Ravi's rank from the start?

- (a) 14th (b) 15th
(c) 16th (d) 17th
(e) None of these

Sol. (c) Rank of Ravi from the last = 17 + 7 = 24th.
∴ Rank of Ravi from the start = (39 – 24) + 1 = 16th.

► Type II Total number of person in a queue

- ❖ Total no. of persons
= [Position of person from upward/right + Position of person from downward/left] – 1.

EXAMPLE ► 3: Rakesh ranks 7th from the top and 28th from the bottom in a class. How many students are there in the class?

- (a) 34 (b) 35
(c) 36 (d) 37
(e) None of these

Sol. (a) Total no. of students = [7 + 28] – 1 = 34.

► Type III When two persons change their rank in a queue

- ❖ If two persons are on a definite position from up and down (or left and right) and they interchange their ranks, then
Total no. of persons in the queue :
= [present position of first person
+ previous position of second person] – 1

EXAMPLE ► 4: In a row of girls, Shilpa is eighth from the left and Reena is seventeenth from the right. If they interchange their positions, Shilpa becomes fourteenth from the left. How many girls are there in the row?

- (a) 34 (b) 35
(c) 30 (d) 37
(e) None of these

Sol. (c) Total no. of girls
= [present position of Shilpa
+ previous position of Reena] – 1
= (14 + 17) – 1 = 30

- ❖ Previous position of first person or present position of second person
= Difference of the two positions of second person
+ previous position of second person.
= Difference of the two positions of first person
+ previous position of second person.

EXAMPLE ► 5: In a row of children, Dipa is fifth from the left and Vijay is sixth from the right. When they interchange their places among themselves, Dipa becomes thirteenth from the left. Then what will be Vijay's position from the right?

- (a) 4th (b) 14th
(c) 8th (d) 12th
(e) 10th

Sol. (b) Present position of Vijay = Difference of the two positions of Dipa + previous position of Vijay
= (13 – 5) + 6 = 14th

SOLVED EXAMPLES

EXAMPLE 1: There are thirty five students in a class. Suman ranks third among the girls in the class. Amit ranks 5th among the boys in the class. Suman is one rank below Amit in the class. No two students hold the same rank in the class. What is Amit's rank in the class?

- (a) Cannot be determined
- (b) 5th
- (c) 8th
- (d) 7th
- (e) None of these

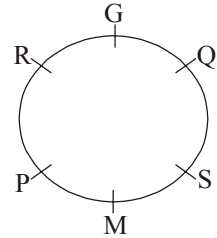
Sol. (d) Suman is one rank below Amit in the class. Hence two girls and four boys are ahead of Amit. Hence Amit's rank in the class is 7th.

EXAMPLE 2: Among six members P, Q, R, G, S and M sitting around a circle facing the centre,

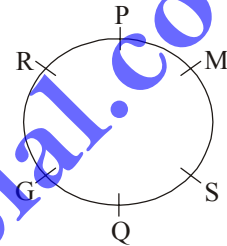
- (a) R is between G and P
 - (b) M is between P and S
- What is the position of Q?
- (a) Cannot be determined
 - (b) Between G and S
 - (c) To the immediate left of G
 - (d) To the immediate right of S
 - (e) None of these

Sol. (b) Seating arrangement is as follows :

Case I



or Case II



Hence position of Q is between G and S in both cases. In circular arrangements, both clockwise and anticlockwise arrangements should be considered.

EXAMPLE 3: Mohan is older than Prabir, Suresh is younger than Prabir. Mihir is older than Suresh but younger than Prabir. Who among the four is the youngest?

- (a) Prabir
- (b) Mihir
- (c) Mohan
- (d) Suresh
- (e) Data inadequate

Sol. (d) Mohan > Prabir > Suresh

Prabir > Mihir > Suresh

Hence, Mohan > Prabir > Mihir > Suresh

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EXERCISE

- Five boys took part in a race. Prabir finished before Mohit but behind Mihir. Suresh finished before Sanchit but behind Mohit. Who won the race?
 - Prabir
 - Mihir
 - Mohit
 - Suresh
 - None of these
- M is older than R. Q is younger than R and N. N is not as old as M. Who among M, N, R and Q is the oldest?
 - M
 - R
 - M or R
 - Data inadequate
 - None of these
- In a class of forty students, Samir's rank from the top is twelfth. Alok is eight ranks below Samir. What is Alok's rank from the bottom?
 - 20th
 - 21st
 - 22nd
 - 19th
 - None of these
- Geeta is taller than Seeta but not shorter than Radha. Radha and Rani are of the same height. Geeta is shorter than Paru. Amongst all the girls, who is the tallest?
 - Geeta
 - Seeta
 - Radha and Rani
 - Paru
 - None of these
- Among five friends Mahesh is taller than Karan but not Yash. Hrithik is taller than Yash but not Abhishek. If they stand in increasing order of their heights, who will be first in line?
 - Abhishek
 - Yash
 - Karan
 - Data inadequate
 - None of these
- Akshay is 16th from the left end in the row of boys and Vijay is 18th from the right end. Avinash is 11th from Akshay towards the right end and 3rd from Vijay towards the right end. How many boys are there in the row?
 - Data inadequate
 - 42
 - 40
 - 48
 - None of these
- Among M, T, R and P, M is older than only P. T is older than R. Who among them is the oldest?
 - T
 - R
 - T or R
 - Data inadequate
 - None of these
- In a row of children facing North, Ritesh is twelfth from the left end. Sudhir who is twenty-second from the right end is fourth to the right of Ritesh. Total how many children are there in the row?
 - 35
 - 36
 - 37
 - 34
 - None of these
- Among A, B, C, D and E, A is taller than B but shorter than C. B is taller than only E. C is not the tallest. Who among them will be in the middle if they stand in the order of their heights?
 - A
 - C
 - 8
 - Cannot be determined
 - None of these
- Madhu is 18th from the left end and Sandhu is 11th from the right end of a row of 40 children. How many children are there between Madhu and Sandhu in the row?
 - 10
 - 9
 - 12
 - 11
 - None of these
- In a class of 10 girls and 20 boys, Jaya's rank is '4' among the girls and '18' in the class. What is Jaya's rank among the boys in the class?
 - Cannot be determined
 - 16
 - 14
 - 15
 - None of these
- Among P, Q, R, S and T, S is older than R but not as old as T; Q is older than only P. Who among them is the youngest?
 - P
 - Q
 - R
 - Cannot be determined
 - None of these
- Hemang is 16th from the top and twelfth from the bottom in merit in the class. How many students are there in the class?
 - 29
 - 28
 - 27
 - Cannot be determined
 - None of these
- Geeta is senior to Shilpa but not to Deepa. Gayatri is junior to Reepa. No one is senior to Fatima. Who is most junior?
 - Shilpa
 - Geeta
 - Gayatri
 - Data inadequate
 - None of these
- Sachin is sitting to the immediate left of Meena but not next to Bharti. Parveen is sitting to the right of Bharti. If the four friends are sitting in a circle, who is sitting to the immediate right of Meena?
 - Parveen
 - Bharti
 - Sachin
 - Meena
 - Cannot be determined
- In a row of 40 students facing North, Kailash is 6th to the left of Soman. If Soman is 30th from the left end of the row, how far is Kailash from the right end of the row?
 - 17th
 - 16th
 - 15th
 - 26th
 - None of these

17. L, M, N and P are sitting around a circle and facing the centre. P is to the immediate left of N. L is between N & M. What is the position of M?
- (a) To the immediate left of L
 (b) To the immediate right of P.
 (c) In front of P
 (d) Between L & N
 (e) None of these
18. Among M, N, P, R and T each one has secured different marks in an examination. R secured more marks than M and T. N secured less marks than P. Who among them secured third highest marks?
- (a) N (b) R
 (c) M (d) T
 (e) Data inadequate
19. In a class of 20 students, Alisha's rank is 15th from the top. Manav is 4 ranks above Alisha. What is Manav's rank from the bottom ?
- (a) 10th (b) 11th
 (c) 9th (d) 12th
 (e) None of these
20. Among A, B, C, D and E each having a different weight, D is heavier than A and E and B is lighter than C. Who among them is the heaviest?
- (a) D (b) B
 (c) C (d) Data inadequate
 (e) None of these
21. Among B, F, J, K and W each having a different weight, F is heavier than only J. B is heavier than F and W but not as heavy as K. Who is the third heaviest among them?
- (a) B (b) F
 (c) K (d) W
 (e) None of these
22. In a row of thirty five children, M is fifteenth from the right end and there are ten children between M and R. What is R's position from the left end of the row?
- (a) 15th (b) 5th
 (c) 30th (d) Data inadequate
 (e) None of these
23. Among P, Q, T, A and B each having a different height, T is taller than P and B but shorter than A and Q. P is not the shortest. Who among them is the tallest?
- (a) A (b) Q
 (c) P (d) P or B
 (e) Data inadequate
24. In a queue of children, Kashish is fifth from the left and Mona is sixth from the right. When they interchange their places among themselves, Kashish becomes thirteenth from the left. Now what will be Mona's position from the right?
- (a) 4th (b) 14th
 (c) 8th (d) 15th
 (e) None of these
25. Five men A, B, C, D and E read a newspaper. The one who reads first gives it to C. The one who reads last had taken it from A. E was not the first or the last to read. There were two readers between B and A. B passed the newspaper to whom?
- (a) A (b) C
 (c) D (d) E
 (e) None of these
26. In a column of girls Kamal is 11th from the front. Neela is 3 places ahead of Sunita who is 22nd from the front. How many girls are there between Kamal and Neela in the column?
- (a) Six (b) Eight
 (c) Seven (d) Cannot be determined
 (e) None of these
27. In a row of girls, Rita and Monika occupy the ninth place from the right end and tenth place from the left end, respectively. If they interchange their places, then Rita and Monika occupies eighteenth place from the left end. How many girls are there in the row?
- (a) 25 (b) 26
 (c) 27 (d) Data inadequate
 (e) None of these
28. In the Olympic Games, the flags of six nations were flown on the masts in the following way: The flag of America was to the left of the Indian tricolour and to the right of the flag of France. The flag of Australia was on the right of the Indian flag but was to the left of the flag of Japan, which was to the left of the flag of China. Find the two flags which are in the centre.
- (a) India and Australia (b) America and India
 (c) Japan and Australia (d) America and Australia
 (e) None of these

ANSWER KEY

1	(b)	7	(a)	13	(c)	19	(a)	25	(b)
2	(a)	8	(c)	14	(d)	20	(d)	26	(d)
3	(b)	9	(a)	15	(b)	21	(d)	27	(b)
4	(d)	10	(c)	16	(a)	22	(d)	28	(a)
5	(c)	11	(d)	17	(e)	23	(e)		
6	(e)	12	(a)	18	(e)	24	(b)		

ANSWERS & EXPLANATIONS

1. (b) Prabir > Mohit
 Mihir > Prabir
 Suresh > Sanchit
 Mohit > Suresh
 Hence, Mihir > Prabir > Mohit > Suresh > Sanchit
 Hence, Mihir won the race.

2. (a) $R < M; Q < R, N; N < M$
 $M > N / R > Q$

3. (b) Total students = 40
 $12 + \dots + 20$
 Sameer Alok

\therefore Alok's rank from bottom
 $= 40 - (12 + 8) + 1$
 $= 21$ st

4. (d) Radha † Geeta > Sita
 Radha = Rani
 Geeta < Paru : Paru is the tallest.

5. (c) Yash > Mahesh > Karan
 Abhishek > Hrithik > Yash
 Karan < Mahesh < Yash < Hrithik < Abhishek

6. (e) Total number of boys = 41.

7. (a) $M > P, T > R$
 $T > R > M > P$ (M is older than only P)
 Hence, T is the eldest.

8. (c) Total number of children in a row
 $= 12 + 4 + 22 - 1 = 37$

9. (a) $D > C > \boxed{A} > B > E$
 \therefore A will be in the middle if they stand in the order of the height.

10. (c) $17 + \bullet \bullet \bullet + 10$
 Madhu Sandhu

\therefore Number of boys between Madhu and Sandhu
 $= 40 - 18 - 11 + 1 = 12$

11. (d) 3 Girls are ahead of Jaya.

\therefore 14 Boys are ahead of Jaya.

\therefore Jaya's rank is 15th among the boys in the class.

12. (a) $T > S > R > Q > P$

\therefore P among them is the youngest

13. (c) Total number of students in the class
 $= 16 + 12 - 1 = 27$

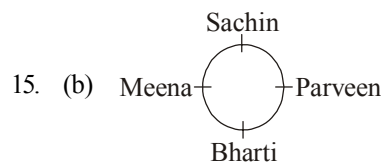
14. (d) Geeta > Shilpa

Deepa > Geeta

Reepa > Gayatri

Fatima is the seniormost

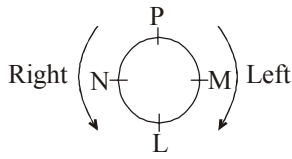
But no other data is there to find who is the juniormost.



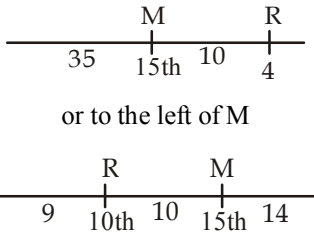
16. (a) $23 + \downarrow \bullet \bullet \bullet \bullet \bullet + 10$
 Kailash Soman

Kailash's position from the right end of the row
 $= 40 - 23 = 17$ th

17. (e) According to question, Order of position would be as follows:



18. (e) Correct order can't be determined.
 19. (a) Manav's rank from the top = $15 - 4 = 11$ th.
 Manav's rank from the bottom = $20 + 1 - 11 = 10$ th
 20. (d) $D > A, E$ and $B < C$
 The heaviest among them can't be determined.
 21. (d) Ascending order of weight : $J > F > W > B > K$
 So, third heaviest is W.
 22. (d) Since R can be to the right of M



R's position can't be determined.

23. (e) $T > P, B$
 $T < A, Q$
 $P > B$

$A, Q > T > P > B$

So, either A or Q is the tallest.

24. (b) Clearly 6th position from right (Mona) is 13th position from left. That means there are $13 + 5 = 18$ children in the row. Hence 5th position from left will be $18 - 5 + 1 = 14$ th from right (Mona's new position).

Previous by Kashish Mona

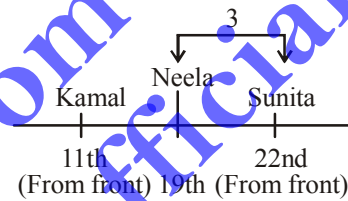
1 2 3 4 (5) 6 7 8 9 10 11 12 (13) 14 15 16 17 18

Present Mona Kashish

25. (b) From the information given in the question, the newspaper was read in the following order B, C, E, A, D.

Hence B passed the newspaper to C.

26. (c)



So there are seven girls between Kamal and Neela.

27. (b) Total no. of girls = $17 + 10 - 1$ or $18 + 9 - 1 = 26$.
 28. (a) The order in which the six flags were flown from L to R is France, America, India, Australia, Japan, China.



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ANALYTICAL PUZZLE

CHAPTER

9

PROBLEM SOLVING

Problem solving puzzle is one of the most important sections of Bank exams. In this section, generally the questions are asked from Ordering or Ranking, Scheduling, Scattering or Distributing. In these types of questions, we have to analyse the given information and condense it in a suitable form to answer the questions. Though there exists no set formulae to solve these kinds of problems, yet a systematic approach can help to solve questions.

As far as possible, it should be tried to tabulate the data, as it helps us to condense the information and reach to conclusions. Following examples will help you to develop methodology to solve these types of questions.

Type of Questions

► Type I PUZZLE BASED ON SCHEDULING

ILLUSTRATION 1 : Directions : On the basis of the information given below, select the correct alternative as answer for the questions which follow the information.

Six plays A, B, C, D, E and F are to be staged, one on each day from Monday to Saturday. The schedule of the plays is to be in accordance with the following informations :

- A must be staged a day before E.
- C must not be staged on Tuesday.
- B must be staged on the day after the day on which F is staged.
- E must not be staged on the last day of the schedule.
- D must be staged on Friday only & immediately before D, B must not be staged.

- Which of the following plays is staged immediately after E.
(a) B (b) D
(c) E (d) F
(e) None of these
- Which of the following plays is staged on Monday?
(a) E (b) F
(c) E (d) B
(e) A
- Play D is between which of the following pairs of plays?
(a) B and E (b) E and F
(c) A and E (d) C and E
(e) None of these

- Which of the following is the schedule of plays, with the order of their staging from Monday?
(a) E, A, B, F, D, C (b) A, F, B, E, D, C
(c) A, F, B, C, D, E (d) F, A, B, E, D, C
(e) None of these
- Play C cannot definitely be staged on which of the following days in addition to Tuesday?
(a) Monday (b) Wednesday
(c) Friday (d) Thursday
(e) Saturday

Solution For Example :

The given information can be tabulated as follows:

Day	Mon	Tue	Wed	Thu	Fri	Sat
Play	F	⊗	A	⊗	D	C
		B		E		

- (b) Play D is staged after E.
- (b) Play F is staged on Monday.
- (d) From the above arrangement we find that play D is staged exactly between the day on which E and C are staged.
- (e) The correct sequence of plays is FBAEDC. None of the options shows the correct order. Hence option (e) is our answer.
- (c) C cannot be staged on Friday in addition to Tuesday because on Friday Play D will be staged.

► Type II PUZZLE BASED ON ORDERING

ILLUSTRATION 2 : Directions : On the basis of the information given below, select the correct alternative as answer for the questions which follow the information.

- Five friends A, B, C, D and E wore shirts of green, yellow, pink, red and blue colours and shorts of black, white, grey, blue and green colours :
- Nobody wore shirt and short of same colour.
- D wore blue shirt and C wore green short.
- The one who wore green shirt, wore black short and the one who wore blue short, wore red shirt.
- A wore white short and pink shirt.
- E did not wear red shirt.
- B did not wear shorts of Black or Green colours.

6. Which colour shirt did C wear?
(a) Yellow (b) Blue
(c) Green (d) Pink
(e) Data inadequate.
7. Which colour short did B wear?
(a) Grey (b) Blue
(c) White (d) Black
(e) Green
8. Who wore white short?
(a) E (b) B
(c) C (d) A
(e) Data inadequate.
9. Who wore black short?
(a) C (b) E
(c) B (d) D
(e) A
10. Which colour shirt and short did 'D' wear?
(a) Black and grey (b) Blue and grey
(c) Blue and white (d) Red and white
(e) None of these

Solution For Example :

The given information can be tabulated as follows:

	Shirts					Shorts				
	Green	Yellow	Pink	Red	Blue	Black	White	Grey	Blue	Green
A	?	×	?	×	×	×	?	×	×	×
B	×	×	×	?	×	×	×	×	?	×
C	×	?	×	×	×	×	×	×	×	?
D	×	×		×	?	×	×	?	×	×
E	×	×	×	×	×	?	×	×	×	×

6. (a) C wears yellow shirt
7. (b) B wears short of blue colour
8. (d) A wears white shorts
9. (b) E wears black shorts
10. (b) D wears blue shirt and grey short

► **Type III PUZZLE BASED ON BLOOD RELATION AND PROFESSIONS.**

ILLUSTRATION 3: Directions : On the basis of the information given below, select the correct alternative as answer for the questions which follow the information :

- (i) A, B, C, D, E, and F are the members of a family. These members are: Psychologist, Manager, Advocate, Jeweller, Doctor and Engineer.
- (ii) Doctor is grandfather of F who is Psychologist.
- (iii) Manager D is married with A.
- (iv) C is a Jeweller, who is married with Advocate.
- (v) B is the mother of F and E.
- (vi) Only two married members are there in the family.

1. What is the profession of E ?
(a) Manager (b) Psychologist
(c) Jeweller (d) Doctor
(e) None of these

2. How many male members are there in the family ?
(a) Four (b) One
(c) Three (d) inadequate information
(e) None of these
3. Which one of the following is the married couple in the family?
(a) AD (b) AC
(c) AB (d) Cannot be determined
(e) None of these
4. What is the relation of A with E ?
(a) Father (b) Uncle
(c) Brother (d) Grandfather
(e) None of these
5. What is the profession of A ?
(a) Advocate (b) Manager
(c) Jeweller (d) Doctor
(e) None of these

Solution for Example:

The given information can be summarized as follows.

A	B	C	D	E	F
Doctor	Advocate	Jeweller	Manager	Engineer	Psychologist
D's Husband	C's Wife	B's Husband	A's Wife	B and C's Son/Daughter	B and C's Son/Daughter
C's father E and F's grand-father	E and F's mother	E and F's father	E and F's grand-mother and C's mother	A and D's grandson/grand-daughter	A and D's grandson/grand-daughter
Male	Female	Male	Female	Male/Female	Male/Female

1. (e) 'E' is an Engineer.
2. (d) Inadequate information.
3. (a) 'A' and 'D' is the married couple in the family.
4. (d) 'A' is grandfather of E.
5. (d) 'A' is a Doctor

► **Type IV PUZZLE BASED ON SITTING ARRANGEMENT**

ILLUSTRATION 4: Directions : On the basis of the information given below, select the correct alternative as answer for the questions which follow the information :

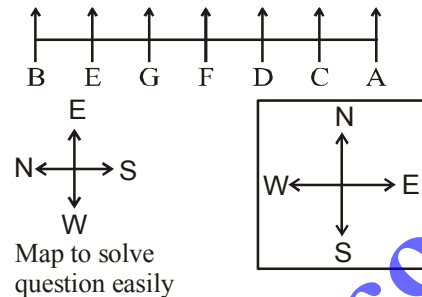
- (i) A, B, C, D, E, F and G are sitting on a wall facing east.
- (ii) C is just right of D.
- (iii) B is on end point and E is his neighbour.
- (iv) G is sitting between E and F.
- (v) D is third from south end.

- Which of the following is a pair of persons who are on end points?
 - AE
 - AB
 - FB
 - CB
 - Cannot be determined
- Which of the following information is not necessary to determine the position of A?
 - i
 - ii
 - iii
 - All information is necessary
 - None of these
- D is sitting between which of the following pairs?
 - CE
 - AC
 - CF
 - AF
 - None of these
- C wants his seat as third from north. He will have to exchange his seat with which person?
 - G
 - F
 - E
 - Cannot be determined
 - None of these

- Who is seated to the right of E ?
 - F
 - D
 - C
 - A
 - None of these

Solution for Examples :

Given information can be digrammatically shown as follows



- (b) A and B is the pair of persons who are at the end points.
- (d) All information is necessary.
- (c) D is seated between C and F.
- (a) He will have to exchange his seat with G.
- (e) G is seated to the right of E.

SOLVED EXAMPLES

Directions (Example 1-5) : Read the following information and answer the questions given below.

Seven managers Sharma, Mishra, Singh, Kulkarni, Rao, Joshi and Nair are to conduct interviews simultaneously either alone or in pairs at four different locations—Surat, Chandigarh, Delhi and Lucknow. Only one wants to travel by rail, two prefer travelling by car and the rest travel by air.

- Sharma is going to Lucknow but neither by car nor by air.
- Mishra prefers to travel by car.
- Neither Joshi nor Nair is going to Delhi.
- Only those going to Surat travel by road.
- Kulkarni will assist his friend Mishra.
- The two managers who go to Delhi travel by air.

EXAMPLE ► 1 : Where will Kulkarni conduct the interviews?

- Surat
- Lucknow
- Chandigarh
- Cannot be determined
- None of these

EXAMPLE ► 2 : Who goes to Delhi ?

- Mishra-Kulkarni
- Rao-Singh
- Kulkarni-Joshi
- Data inadequate
- None of these

EXAMPLE ► 3 : Which of the following is true ?

- Kulkarni travels by air.
- Nair will assist Rao.
- Sharma conducts interviews alone
- Joshi goes to Chandigarh
- None of these

EXAMPLE ► 4 : Who will conduct interviews at Chandigarh?

- Nair
- Singh
- Rao
- Data inadequate
- None of these

EXAMPLE ► 5 : Which of the following pairs is different from the other four with regard to mode of travel ?

- Sharma-Mishra
- Rao-Mishra
- Nair-Rao
- Kulkarni-Joshi
- Sharma-Singh

Solution For Examples 1-5:

Manager	Place of Interview	Means of Travel
Sharma	Lucknow	Rail
Mishra	Surat	Car
Singh	Delhi	Air
Kulkarni	Surat	Car
Rao	Delhi	Air
Joshi	Chandigarh / Lucknow	Air
Nair	Chandigarh / Lucknow	Air

- (a)
- (b)
- (e)
- (d)
- (c)

Directions (Examples 6-10) : Study the following information carefully and answer the questions given below:

P, Q, R, S, T and V are six students studying in a class. Each of them has a different height and weight. The tallest is not the heaviest. T is taller than only P but lighter than R. Q is taller than S and P and heavier than only T and V. P is lighter than only S. T is heavier than V. S is taller than V and Q is not the tallest.

EXAMPLE ▶ 6 : How many of them are heavier than T?

- (a) One
- (b) Two
- (c) Three
- (d) Five
- (e) None of these

EXAMPLE ▶ 7 : How many of them are shorter than Q?

- (a) Two
- (b) Four
- (c) Three
- (d) Five
- (e) None of these

EXAMPLE ▶ 8 : Who among them is the tallest?

- (a) V
- (b) P
- (c) T
- (d) R
- (e) None of these

EXAMPLE ▶ 9 : Who, among them is third from top if arranged in descending order of height?

- (a) Q
- (b) V
- (c) S
- (d) Data inadequate
- (e) None of these

EXAMPLE ▶ 10 : Who among them is the lightest?

- (a) V
- (b) T
- (c) P
- (d) R
- (e) None of these

Solutions For Examples 6-10 :

Sequence according to height
 $R > Q > S > V > T > P$
 Sequence according to weight
 $S > P > R > Q > T > V$

- 6. (e) S, P, R, and Q are heavier than T
- 7. (b) S, V, T, and P are shorter than Q
- 8. (d) R is the tallest.
- 9. (c) S is the third from the top.
- 10. (a) V is the lightest.

Directions (Examples 11-15): Study the following information carefully and answer the question given below:

A, B, C, D, E, F, G and H are sitting around a circle facing to the centre. D is second to the left of F and third to the right of H. A is second to the right of F and the immediate neighbour of H. C is second to the right of B and F is third to the right of B. G is not an immediate neighbour of F.

EXAMPLE ▶ 11 : How many of them are there between H and C?

- (a) Two
- (b) Three
- (c) Two or Three
- (d) Data inadequate
- (e) None of these

EXAMPLE ▶ 12 : Who is to the immediate left of A?

- (a) H
- (b) E
- (c) G
- (d) Data inadequate
- (e) None of these

EXAMPLE ▶ 13 : In which of the following pairs is the first person sitting to the immediate left of the second person ?

- (a) CD
- (b) BG
- (c) HA
- (d) FC
- (e) None of these

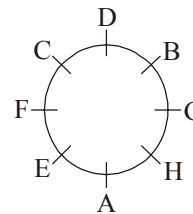
EXAMPLE ▶ 14 : Who is fourth to the right of B ?

- (a) E
- (b) C
- (c) A
- (d) Data inadequate
- (e) None of these

EXAMPLE ▶ 15 : What is E's position with respect to G?

- (a) Second to the right
- (b) Third to the left
- (c) Third to the right
- (d) Second to the left
- (e) None of these

Sol. Seating arrangement is as follows:



- 11. (b) 12. (b) 13. (e) 14. (a) 15. (b)

EXERCISE

Directions (Qs. 1-5): Study the information given below to answer the questions:

- (i) P, Q, R, S, T, U and V are sitting along a circle facing the centre.
 - (ii) P is between V and S.
 - (iii) R, who is 2nd to the right of S is between Q and U.
 - (iv) Q is not the neighbour of T.
1. Which of the following is CORRECT statement ?
 - (a) V is between P and S
 - (b) S is 2nd to the left of V
 - (c) R is third to the left of P
 - (d) P is to the immediate left of S
 - (e) None of these

2. What is the position of T?
 - (a) Between R and V
 - (b) To the immediate left of V
 - (c) 2nd to the left of R
 - (d) 2nd to the left of P
 - (e) None of these
3. Who is between R and U?
 - (a) Cannot be determined
 - (b) S
 - (c) V
 - (d) Q
 - (e) None of these

4. Which of the following is a wrong statement?
 (a) R is to the immediate right of U
 (b) Q is to the immediate left of R
 (c) T is third to the right of Q
 (d) U is to the immediate left of T
 (e) None of these ,
5. Which of the following pairs has 2nd member sitting to the immediate right of the first member?
 (a) QS (b) PV
 (c) RU (d) VT
 (e) None of these

Directions (Q. 6-10): Study the following information carefully and answer the questions given below:

A, B, C, D, E and F are six students studying in a class. Each of them has a different height and weight. The tallest is not the heaviest. E is taller than only A but lighter than C. B is taller than D and A and heavier than only E and F. A is lighter than only D. E is heavier than F. D is taller than F and B is not the tallest.

6. How many of them are heavier than E?
 (a) One (b) Two
 (c) Three (d) Five
 (e) None of these
7. How many of them are shorter than B?
 (a) Two (b) Four
 (c) Three (d) Five
 (e) None of these
8. Who among them is the tallest?
 (a) F (b) A
 (c) E (d) C
 (e) None of these
9. Who, among them is third from top if arranged in descending order of height?
 (a) B (b) F
 (c) D (d) Data inadequate
 (e) None of these
10. Who among them is the lightest?
 (a) F (b) E
 (c) A (d) C
 (e) None of these

Directions (Q. 11-14) : Study the following information carefully and answer the questions given below:

W, Y, T, M, R, H and D are seven persons, sitting around a circle facing the centre. T is fourth to the right of M who is second to the right of R. W is third to the left of R. H is not an immediate neighbour of M. D is not an immediate neighbour of W.

11. Who is to the immediate left of H?
 (a) W (b) T
 (c) R (d) Data inadequate
 (e) None of these
12. Who is third to the right of H ?
 (a) M (b) D
 (c) Y (d) R
 (e) None of these

13. Who is third to the right of D?
 (a) M (b) R
 (c) W (d) M
 (e) None of these
14. What is Y's position with respect to T?
 (a) Third to the right (b) Fourth to the left
 (c) Third to the left (d) Second of the left
 (e) None of these

Directions (Q. 15-19): Study the following information carefully and answer the questions given below:

B, M, T, R, K, H and D are travelling in a train compartment with a 3-tier sleeper berth. Each of them has a different profession of Engineer, Doctor, Architect, Pharmacist, Lawyer, Journalist and Pathologist. They occupied two lower berths, three middle berths and two upper berths. B, the Engineer is not on the upper berth. The Architect is the only other person who occupies the same type of berth as that of B. M and H are not on the middle berth and their professions are Pathologist and Lawyer respectively. T is a Pharmacist. D is neither a Journalist nor an Architect. K occupies the same type of berth as that of the Doctor.

15. What is D's profession?
 (a) Doctor (b) Engineer
 (c) Lawyer (d) Pharmacist
 (e) Data inadequate
16. Which of the following groups occupies the middle berths ?
 (a) DKR (b) DHT
 (c) HKT (d) DKT
 (e) None of these
17. Which of the following combinations of person-berth-profession is correct ?
 (a) R-Lower-Journalist (b) R-Lower-Architect
 (c) D-Upper-Doctor (d) K-Upper-Lawyer
 (e) All correct
18. Which of the following pairs occupy the lower berths?
 (a) BD (b) BR
 (c) BT (d) Data inadequate
 (e) None of these
19. Who is the Architect ?
 (a) D (b) H
 (c) R (d) Data inadequate
 (e) None of these,

Directions (Q.20-24): Study the following information carefully to answer these questions :

Eight friends J, K, L, M, N, O, P and Q are sitting around a circle facing the centre. J is not the neighbour of N. L is third to the right of K. Q is second to the left of N who is next to the right of L. O is not the neighbour of N or K and is to the immediate left of P.

20. Which of the following is the correct position of L?
 (a) To the immediate right of N
 (b) To the immediate right of Q
 (c) To the immediate left of N
 (d) To the immediate left of Q
 (e) None of these

21. Which of the following pair of persons represent O's neighbours?
 (a) L&N (b) P&K
 (c) M&P (d) N&P
 (e) None of these
22. Which of the following groups has the first person sitting between the other two persons?
 (a) PKJ (b) JQL
 (c) QNL (d) LMN
 (e) None of these
23. Who is to the immediate right of K?
 (a) J (b) P
 (c) Q (d) Cannot be determined
 (e) None of these
24. Who is to the immediate left of O?
 (a) P (b) L
 (c) Q (d) M
 (e) None of these

Directions (Q. 25 - 29): These questions are based on the basis of following information. Study it carefully and answer the questions.

Eight executives J, K, L, M, N, O, P and Q are sitting around a circular table for a meeting. J is second to the right of P who is third to the right of K. M is second to the left of O who sits between P and J. L is not a neighbour of K or N.

25. Who is to the immediate left of L?
 (a) Q (b) O
 (c) K (d) N
 (e) None of these
26. Who is to the immediate left of K?
 (a) N (b) J
 (c) Q (d) Cannot be determined
 (e) None of these
27. Which of the following is the correct position of N?
 (a) Second to the right of K
 (b) To the immediate left of K
 (c) To the immediate right of M
 (d) To the immediate right of K
 (e) None of these
28. Who is third to the right of P?
 (a) L (b) J
 (c) Q (d) N
 (e) None of these
29. Which of the following groups of persons have the first person sitting between the other two?
 (a) PJO (b) OPJ
 (c) OPM (d) MPO
 (e) None of these

Directions (Q 30-34): Read the following information carefully and answer the questions given below.

Six executives Akash, Bipasha, Deepak, Jyoti, Kartik and Priya have to advertise four products i.e., soap, watches, computers and chocolates on 3 different channels, i.e., Go, One and Spice either alone or in pairs. An executive can visit only one channel and advertise only one product. No more than two executives can advertise on a channel.

- (i) Bipasha and Jyoti both visit the same channel but advertise different products.
 (ii) Akash who visits Go advertises neither soap nor computers.
 (iii) Kartik does not advertise chocolates.
 (iv) No girl advertises soap.
 (v) The two executives who advertise chocolates visit Spice.
30. Who advertises watches?
 (a) Deepak (b) Kartik
 (c) Akash (d) Priya
 (e) None of these
31. Which of the following Channel-product pairs is definitely incorrect?
 (a) Go-watch (b) One-computer
 (c) Go-soap (d) One-soap
 (e) One - watch
32. Which channel does Kartik visit?
 (a) Go (b) Spice.
 (c) One (d) Cannot be determined
 (e) None of these
33. If Bipasha advertises computers which of the following must be true?
 (a) Jyoti advertises soap
 (b) Jyoti advertises watches
 (c) Kartik advertises computers
 (d) Kartik works for Spice
 (e) None of these
34. What will Jyoti advertise?
 (a) Chocolates
 (b) Watches
 (c) Computer or watches
 (d) Cannot be determined
 (e) None of these
- Directions (Q. 35-39) :** Study the following information carefully to answer these questions.
- Eight executives H, I, J, K, L, M, N and P are sitting around a circular table for a meeting. M is third to the right of J and second to the left of K. H is to the immediate left of I. P is to the immediate right of K. L is third to the left of N.**
35. Which of the following pairs of persons represent immediate neighbours of M?
 (a) K, I (b) L, I
 (c) H, I (d) H, L
 (e) None of these

36. In which of the following pairs the second person is second to the right of first person ?
 (l) LI (b) NL
 (c) PJ (d) KM
 (e) None of these
37. Which of the following is definitely correct?
 (a) K is to the immediate right of I
 (b) P is second to the right of J
 (c) H is to the immediate left of J
 (d) I is to the immediate right of M
 (e) None of these
38. Who is to the immediate right of J?
 (a) L (b) I
 (c) N (d) H
 (e) None of these
39. Who is second to the left of M?
 (a) H (b) P
 (c) J (d) K
 (e) None of these
- Directions (Q. 40-45): Study the following information carefully to answer these questions:**
- (i) P, Q, R, S, T, U and V are sitting around a circle facing the centre.
 (ii) P is between T and S.
 (iii) U is between Q and V.
 (iv) Q is 2nd to the right of T.
40. V is
 (a) 2nd to the left of P
 (b) between P and U
 (c) to the immediate left of U
 (d) 4th to the left of T
 (e) None of these
41. Which of the following is the correct statement?
 (a) S is between R and P
 (b) Q is between T and R
 (c) P is 3rd to the left of Q
 (d) S is to the immediate left of V
 (e) None of these
42. What is the position of R?
 (a) Cannot be determined
 (b) Between Q and T
 (c) To the immediate left of T
 (d) 2nd to the right of Q
 (e) None of these
43. Which of the following pairs has its second member sitting to the immediate left of the first member?
 (a) PT (b) RQ
 (c) TV (d) SP
 (e) None of these
44. Which of the following pairs has its first member sitting second to the right of the second member ?
 (a) TS (b) US
 (c) RS (d) PR
 (e) None of these
45. Which of the following is the wrong statement ?
 (a) S is immediate neighbour of V
 (b) R is immediate neighbour of T
 (c) Q is immediate neighbour of R
 (d) T is immediate neighbour of S
 (e) All are correct statements.
- Directions (46-50) : Study the following information and answer the questions given below it.**
- Eight friends A, B, C, D, E, F, G and H are sitting around a circle and facing the centre. E is third to the left of G who is to the immediate right of B who is third to the left of A. H is second to the right of F who is not an immediate neighbour of E. D is not an immediate neighbour of B.**
46. Which of the following is the correct position of B with respect to D?
 (a) Second to the right
 (b) Second to the left
 (c) Third to the right
 (d) Third to the left
 (e) None of these
47. Who sits between A & D ?
 (a) F (b) E
 (c) G (d) B
 (e) H
48. What is E's position with respect to C ?
 (a) To the immediate right
 (b) To the immediate left
 (c) Second to the right
 (d) Cannot be determined
 (e) None of these
49. Which of the following pairs has the first person to the immediate left of second person?
 (a) GB (b) AF
 (c) CE (d) HD
 (e) None of these
50. Who is second to the right of B?
 (a) F (b) A
 (c) H (d) D
 (e) None of these
- Directions (51-55) : Study the following information carefully and answer the given questions.**
- Seven flights namely those of Jet Airways, British Airways, Delta, Quantas, Emirates, Lufthansa and Air India are scheduled to fly to London. There is only one flight to London on each of the seven days of the week, starting from Monday and ending on Sunday. Delta flies on Wednesday. Air India flies the day next to British**

Airways. British Airways does not fly on Monday or Friday. Two airlines fly between the days British Airways and Emirates fly. Emirates does not fly on Sunday. Quantas flies a day before Lufthansa.

51. On which of the following day does Jet Airways fly ?

- (a) Friday (b) Sunday
(c) Tuesday (d) Thursday
(e) None of these

52. How many flights fly between Lufthansa and Delta ?

- (a) None (b) One
(c) Two (d) Three
(e) Five

53. Which of the following flight flies on Friday ?

- (a) Air India (b) Quantas
(c) Emirates (d) Lufthansa
(e) Jet Airways

54. If Delta postpones its flight to Sunday owing to some technical reasons and all the flights scheduled for Thursday to Sunday are now made to take off a day ahead of the schedule, which of the following flight would now fly on Friday ?

- (a) Lufthansa (b) Jet Airways
(c) British Airways (d) Air India
(e) Quantas

55. If Emirates is related to British Airways and Delta is related to Quantas in a certain way based upon the given flight schedule, then Jet Airways will be related to which of the following based upon the same relationship ?

- (a) Lufthansa (b) Quantas
(c) Delta (d) Air India
(e) None of these

Directions (56-60) : Study the following information to answer the given questions :

Six plays – A, B, C, D, E and F are to be staged on six days of the week starting from Monday and ending on Saturday. Play C is staged on Tuesday. Plays A, F and B are staged one after the other in the same order. Play D is not staged on Monday or Wednesday.

56. How many plays are staged after play A is staged ?

- (a) One (b) Two
(c) Three (d) Four
(e) Cannot be determined

57. Four of the following five form a group based on the days that they are staged. Which one of them does not belong to that group ?

- (a) EC (b) FD
(c) CA (d) AF
(e) BD

58. Which play is staged immediately before the day play E is staged ?

- (a) B (b) A
(c) F (d) D
(e) There is no such play staged

59. If play D was staged on a Monday, which of the following plays would definitely be staged on a Saturday (all the other conditions given above remain the same) ?

- (a) B (b) A
(c) E (d) E or B
(e) Cannot be determined

60. Which play is staged on Thursday ?

- (a) B (b) E
(c) D (d) F
(e) Cannot be determined

Directions (61-65) : Study the following information to answer the given questions :

Nine friends L, M, N, O, P, Q, R, S and T are sitting around a circle facing the centre. T sits fifth to the right of R. N is not an immediate neighbour of either R or T. M sits between S and P. N sits fourth to the left of P. O sits second to the right of Q. S is not an immediate neighbour of T.

61. Who is second to the right of M ?

- (a) R
(b) T
(c) L
(d) Cannot be determined
(e) None of these

62. If all the nine friends are made to sit alphabetically in the clockwise direction starting from L, positions of how many will remain unchanged (excluding L) ?

- (a) None (b) One
(c) Two (d) Three
(e) Four

63. Four of the following five are alike in a certain way based on their seating positions in the above arrangement and so form a group. Which is the one that does not belong to the group ?

- (a) LP (b) SP
(c) TS (d) LN
(e) QO

64. Which of the following is O's position with respect to M in the anti-clockwise direction starting from M ?

- (a) Fourth to the left (b) Fifth to the left
(c) Third to the right (d) Fifth to the right
(e) None of these

65. If S : Q then N : ?

- (a) R (b) O
(c) L (d) T
(e) None of these

66. Who is to the immediate left of T ?
 (a) O (b) Q
 (c) L (d) Cannot be determined
 (e) None of these

DIRECTIONS (Qs.67-71) : Study the following information carefully to answer the questions that follow.

- (I) M, N, P, Q, S and T are six members of a group in which there are three female members. Females work in three departments – Accounts, Administration and Personnel and sit on three different floors – 1st, 2nd and 3rd. Persons working in the same department are not on the same floor. On each floor, two persons work.
- (II) No two ladies work in the same department or sit on the same floor. N and S work in the same department but not in personnel. Q works in Administration. S and M are on the 1st and 3rd floors respectively and work in the same department. Q, a lady, does not work on 2nd floor. P, a man, works on the 1st floor.
67. Which of the following groups of persons are females ?
 (a) SQT (b) QMT
 (c) QPT (d) Data inadequate
 (e) None of these
68. T works in which department ?
 (a) Accounts (b) Administration
 (c) Personnel (d) Accounts or Personnel
 (e) None of these
69. Which of the following pairs of persons work on the 1st floor?
 (a) PT (b) SM
 (c) QN (d) Data inadequate
 (e) None of these
70. If T is transferred to Accounts and S is transferred to Administration, who is to be transferred to Personnel to maintain the original distribution of females on each floor ?
 (a) P (b) N
 (c) Q (d) Data inadequate
 (e) None of these
71. Which of the following pairs of persons works in Administration ?
 (a) QP (b) QN
 (c) SP (d) Data inadequate
 (e) None of these

DIRECTIONS (Qs.72- 76) : The questions below are based on the following statements.

Asha and Charu are good in Mathematics and Athletics. Deepa and Asha are good in Athletics and Studies, Charu and Beena are good in General Knowledge and Mathematics. Deepa, Beena and Ela are good in Studies and General Knowledge. Ela and Deepa are good in Studies and Arts.

72. Who is good only in Studies, General Knowledge, Athletics and Arts ?
 (a) Asha (b) Beena
 (c) Charu (d) Deepa
 (e) None of these
73. Who is good in Studies, General Knowledge and Mathematics ?
 (a) Asha (b) Beena
 (c) Charu (d) Deepa
 (e) None of these
74. Who is good only in Studies, Mathematics and Athletics ?
 (a) Asha (b) Beena
 (c) Charu (d) Deepa
 (e) None of these
75. Who is good only in Athletics, General Knowledge and Mathematics ?
 (a) Asha (b) Beena
 (c) Charu (d) Deepa
 (e) None of these
76. Who is good in Studies, General Knowledge and Arts but not in Athletics ?
 (a) Asha (b) Beena
 (c) Charu (d) Ela
 (e) None of these

DIRECTIONS (Qs.77-81) : On the basis of the following information, answer the questions that follow.

Six people are sitting on the ground in a hexagonal shape. The hexagon's vertices are marked as A, B, C, D, E and F but not in any order. However, all the sides of the hexagon are of same length. A is not adjacent to B or C; D is not adjacent to C or E; B and C are adjacent; F is in the middle of D and C.

77. If one neighbour of A is D, then who is the other one ?
 (a) B (b) C
 (c) E (d) F
 (e) None of these
78. Who is placed opposite to E ?
 (a) F (b) D
 (c) C (d) B
 (e) None of these
79. Who is at the same distance from D as E is from D ?
 (a) B (b) C
 (c) D (d) F
 (e) None of these
80. Which of the following is not a correct neighbouring pair ?
 (a) B & F (b) C & F
 (c) D & F (d) A & E
 (e) None of these

81. Which of the following is not a correct neighbouring triplet?
 (a) B, C, F (b) A, F, B
 (c) D, A, E (d) F, D, A
 (e) None of these
89. The organisation would end with which of the following plays?
 (a) A (b) D
 (c) B (d) Cannot be determined
 (e) None of these

DIRECTIONS (Qs.82-86): Study the information given below to answer the questions that follow :

- (i) There is a family of 5 persons A, B, C, D and E.
 (ii) They are working as a doctor, a teacher, a trader, a lawyer and a farmer.
 (iii) B, an unmarried teacher, is the daughter of A.
 (iv) E, a lawyer, is the brother of C.
 (v) C is the husband of the only married couple in the family.
 (vi) Daughter-in-law of A is a doctor.

82. Which of the following is a group of female members in the family?
 (a) A and D (b) D and E
 (c) A, C and E (d) B and D
 (e) Data inadequate
83. Which of the following is the married couple?
 (a) A and B (b) C and D
 (c) A and D (d) B and C
 (e) None of these

84. Which of the following is a group of male members in the family?
 (a) A, B and C (b) B and D
 (c) A, C and E (d) A, C and D
 (e) Data inadequate

85. Who is the doctor in the family?
 (a) A (b) B
 (c) C (d) D
 (e) None of these

86. Who is the trader in the family?
 (a) A (b) B
 (c) C (d) D
 (e) Data inadequate

DIRECTIONS (Qs. 87 - 91) : Study the information given below to answer these questions :

- (i) Six plays A, B, C, D, E and F are to be organised from Monday to Saturday, i.e., from 5th to 10th—one play each day.
 (ii) There are two plays between C and D and one play between A and C.
 (iii) There is one play between F and E and E is to be organised before F.
 (iv) B is to be organised before A, not necessarily immediately.
 (v) The organisation does not start with B

87. The organisation would start from which play?
 (a) A (b) F
 (c) D (d) Cannot be determined
 (e) None of these

88. On which date is the play E to be organised ?
 (a) 5th (b) 7th
 (c) 6th (d) Cannot be determined
 (e) None of these

90. On which day is the play B organised ?
 (a) Tuesday (b) Friday
 (c) Thursday (d) Sunday
 (e) None of these
91. Which of the following is the correct sequence of organising of plays?
 (a) AECFBD (b) DFECBA
 (c) BDEFCA (d) DBECFA
 (e) None of these

Directions (92-96) : Study the following information carefully to answer these questions.

A, B, C, D, E, F, G and H are sitting around a circle facing the centre. F is third to the right of C and second to the left of H. D is not an immediate neighbour of C or H. E is to the immediate right of A, who is second to the right of G.

92. Who is second to the left of C?
 (a) A (b) B
 (c) E (d) D
 (e) None of these
93. Who is to the immediate right of C?
 (a) E (b) B
 (c) D (d) B or D
 (e) None of these
94. Which of the following pairs of persons has first person sitting to the right of the second person?
 (a) CB (b) AE
 (c) FG (d) HA
 (e) DB
95. Who sits between G & D?
 (a) H (b) D
 (c) F (d) E
 (e) None of these

96. Which of the following is the correct position of B with respect to H?

- I Second to the right
 II Fourth to the right
 III Fourth to the left
 IV Second to the left

- (a) Only I (b) Only II
 (c) Only III (d) Both II & III
 (e) None of these

DIRECTIONS (Qs. 97 - 101) : Read the following information carefully and answer the questions that follow:

At a party, A, B, C, D and E are sitting in a circle. The group comprises a professor, an industrialist and a businessman. The businessman is sitting in between his wife D and the industrialist. A, the professor is married to E, who is the sister of B. The industrialist is seated to the right of C. Both the ladies are unemployed.

97. What is A to B ?
 (a) Brother (b) Uncle
 (c) Brother-in-law (d) Can't be determined
 (e) None of these
98. A is sitting to the right of
 (a) the industrialist (b) his wife
 (c) D (d) Can't be determined
 (e) None of these
99. Who is the industrialist ?
 (a) D (b) A
 (c) B (d) Can't be determined
 (e) None of these
100. Who in the group is unmarried?
 (a) Professor (b) Industrialist
 (c) Businessman (d) Can't be determined
 (e) None of these
101. Who among them must be at least a graduate ?
 (a) B (b) A
 (c) C (d) E
 (e) None of these
102. Which of the following cannot be true ?
 (a) E finishes second.
 (b) F finishes second.
 (c) E finishes ahead of F.
 (d) F finishes ahead of D.
 (e) None of these
103. If D finishes third, then which of the following must be true?
 (a) G finishes first.
 (b) E finishes ahead of F.
 (c) F finishes ahead of E.
 (d) F finishes behind D.
 (e) None of these
104. If C finishes first, then in how many different orders is it possible for the other golfers to finish?
 (a) 1 (b) 2
 (c) 3 (d) 4
 (e) None of these
105. Which of the following additional conditions make it certain that F finishes second ?
 (a) C finishes ahead of D.
 (b) D finishes ahead of F.
 (c) F finishes ahead of D.
 (d) D finishes behind G.
 (e) None of these
106. If exactly one golfer finishes between C and D, then which of the following must be true?
 (a) C finishes first. (b) G finishes first.
 (c) F finishes third. (d) E finished fourth.
 (e) None of these

DIRECTIONS (Qs. 102-106) : Study the following paragraph and then answer the questions that follow.

Five golfers C, D, E, F and G play a series of matches in which the following are always true of the results. Either C is the last and G is the 1st or C is the 1st and G is the last. D finishes ahead of E. Every golfer plays in and finishes every match. There are no ties in any match, i.e. no two players ever finish in the same position in a match.

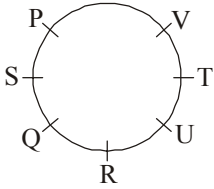
ANSWER KEY

1	(d)	15	(a)	29	(b)	43	(e)	57	(b)	71	(d)	85	(d)	99	(c)
2	(b)	16	(d)	30	(c)	44	(a)	58	(e)	72	(d)	86	(e)	100	(d)
3	(e)	17	(b)	31	(d)	45	(d)	59	(c)	73	(c)	87	(c)	101	(b)
4	(a)	18	(b)	32	(a)	46	(c)	60	(d)	74	(a)	88	(b)	102	(a)
5	(c)	19	(c)	33	(b)	47	(e)	61	(a)	75	(c)	89	(a)	103	(c)
6	(e)	20	(b)	34	(c)	48	(b)	62	(c)	76	(d)	90	(a)	104	(c)
7	(b)	21	(c)	35	(b)	49	(d)	63	(c)	77	(c)	91	(d)	105	(c)
8	(d)	22	(e)	36	(c)	50	(a)	64	(d)	78	(a)	92	(a)	106	(d)
9	(c)	23	(a)	37	(e)	51	(c)	65	(c)	79	(b)	93	(b)		
10	(a)	24	(d)	38	(d)	52	(c)	66	(c)	80	(a)	94	(e)		
11	(a)	25	(e)	39	(a)	53	(a)	67	(a)	81	(b)	95	(c)		
12	(b)	26	(c)	40	(a)	54	(e)	68	(c)	82	(e)	96	(d)		
13	(c)	27	(d)	41	(c)	55	(d)	69	(e)	83	(b)	97	(c)		
14	(c)	28	(a)	42	(b)	56	(c)	70	(c)	84	(e)	98	(d)		

ANSWERS & EXPLANATIONS

(Qs. 1-5) :

Seating arrangement is as follows:



- 1. (d) 2. (b) 3. (e)
- 4. (a) 5. (c)

(Qs. 6-10) :

The given information can be summarized as follows.
According to height:

$$C > B > D > F > E > A$$

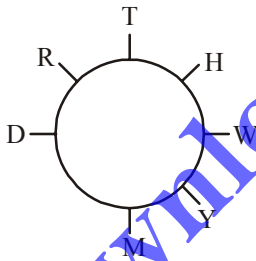
According to weight:

$$D > A > C > B > E > F$$

- 6. (e) D, A, C and B, are heavier than T.
- 7. (b) D, F, E, and A are shorter than Q.
- 8. (d) C is the tallest.
- 9. (c) D is the third from the top.
- 10. (a) F is the lightest.

(Qs. 11-14) :

Seating arrangement is as follows:



- 11. (a) 12. (b) 13. (c) 14. (c)

(Qs. 15-19)

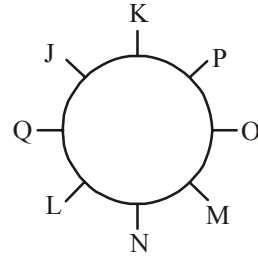
The given information can be summarized as follows :

Person	Profession	Berth
B	Engineer	Lower
M	Pathologist	Upper
T	Pharmacist	Middle
R	Architect	Lower
K	Journalist	Middle
H	Lawyer	Upper
D	Doctor	Middle

- 15. (a) D is a Doctor.
- 16. (d) D K T
- 17. (b)
- 18. (b) BR
- 19. (c)

(Qs. 20-24):

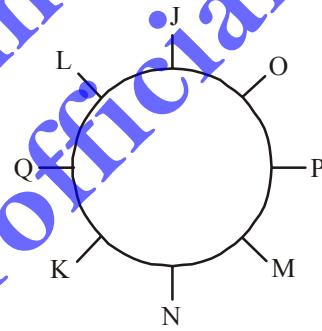
Seating arrangement is as follows:



- 20. (b) 21. (c) 22. (e) 23. (a)
- 24. (d)

(Qs. 25-29):

Seating arrangement is as follows:



- 25. (e) 26. (c) 27. (d) 28. (a)
- 29. (b)

(Qs. 30-34):

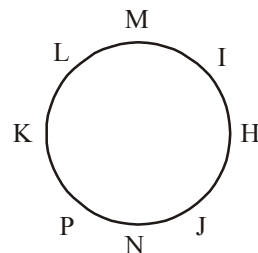
The given information can be summarized as follows :

Executive	Channel	Product
Akash	Go	Watches
Bipasha	One	Watches/Computers
Deepak	Spice	Chocolates
Jyoti	One	Computers/Watches
Kartik	Go	Soap
Priya	Spice	Chocolates

- 30. (c) 31. (d) 32. (a) 33. (b)
- 34. (c)

(Qs. 35-39):

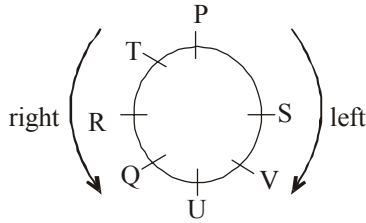
Seating arrangement is as follows:



- 35. (b) L and I are immediate neighbours of M.
- 36. (c) J is the second person to the right of P.
- 37. (e) All the given statements are incorrect.
- 38. (d) H is to the immediate right of J.
- 39. (a) H is the second person to the left of M.

(Qs. 40-45):

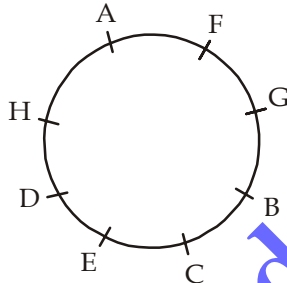
Seating arrangement is as follows:



- 40. (a) 41. (c) 42. (b)
- 43. (e) 44. (a) 45. (d)

(Qs. 46-50):

Seating arrangement is as follows:



- 46. (c) 47. (e) 48. (b)
- 49. (d) 50. (a)

(Qs. 51-55):

The given information can be summarized as follows :

Flights	Day
Jet Airways	Tuesday
British Airways	Thursday
Delta	Wednesday
Quantas	Saturday
Emirates	Monday
Lufthansa	Sunday
Air India	Friday

- 51. (c) 52. (c) 53. (a)
- 54. (e) 55. (d)

(Qs. 56-60):

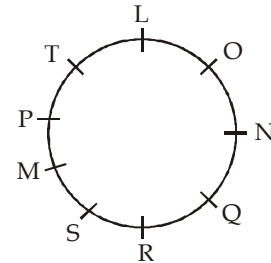
The given information can be summarized as follows.

Plays	Days
A	Wednesday
B	Friday
C	Tuesday
D	Saturday
E	Monday
F	Thursday

- 56. (c) Play A is staged on Wednesday. So plays F, B and D are staged after play A is staged.
- 57. (b) All others are staged one after the other.
- 58. (e) Play E is staged on Monday, the first day.
- 59. (c) 60. (d)

Sol. (61-66):

Seating arrangement is as follows:



- 61. (a)
- 62. (c) Positions of N and T are not changed
- 63. (c) All other pairs have only one person between them.
- 64. (d)
- 65. (c) S is second to left of Q. Similarly, N is second to left of L
- 66. (c)

(Qs. 67-71)

The given information can be summarized as follows.

	Floors					
	I		II		III	
Member	P	S	N	T	M	Q
Department	Not clear	Acc	Acc	Per-sonnel	Acct.	Adm.
Sex	M	F	M	F	M	F

- 67. (a) From the analysis of the table constructed above, SQT is the group of females.
- 68. (c) Clearly, T works in personnel.
- 69. (e) N and T work on the second floor.
- 70. (c) To maintain the original distribution of females on each floor, Q must be transferred to personnel.
- 71. (d) Data is inadequate to determine the department of P. From the information provided only we can say that Q works in administration.

(Qs. 72 - 76)

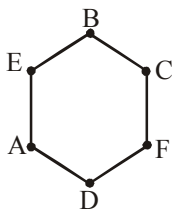
Given information can be tabulated as follows:

Names	Good Subjects
Asha, Charu, Beena	Mathematics
Asha, Charu, Deepa	Athletics
Deepa, Asha, Ela, Beena	Studies
Beena, Charu, Deepa, Ela	General Knowledge
Ela, Deepa	Arts

- 72. (d) 73. (c) 74. (a)
- 75. (c) 76. (d)

For Qs. (77-81)

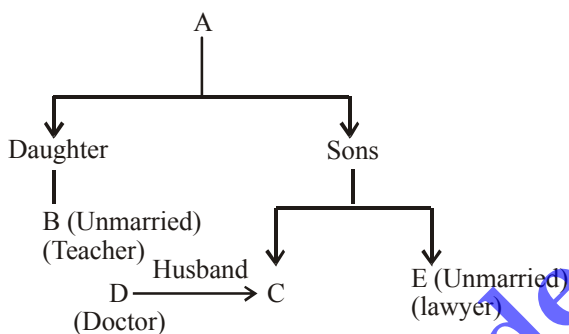
The following hexagonal arrangement is possible.



- 77. (c) The other neighbour of A is E.
- 78. (a) F is placed opposite to E.
- 79. (b) Clearly, C is the required person.
- 80. (a) B and F are not neighbours.
- 81. (b) A, F, B is not a neighbouring triplet.

For (Qs. 82 - 86)

The given information can be summarized as follows.



- 82. (e) Since gender of A is unknown we cannot conclude regarding the options given.
- 83. (b) From the above C and D are the married couple.
- 84. (e) Same reason as in Q. 82.
- 85. (d) D, the wife of the C is the doctor in the family.
- 86. (e) Professions of A and C are not given.

For (Qs. 87 - 91)

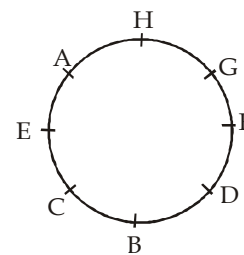
The Organisation of the plays will be as follows

5th	6th	7th	8th	9th	10th
Mon	Tue	Wed	Thu	Fri	Sat
D	B	E	C	F	A

- 87. (c) The organisation would start from play D which is clear from above.
- 88. (b) E is to be organised on 7th.
- 89. (a) The organisation would end with the play A on 10th.
- 90. (a) The play B is organised on 6th which is a Tuesday.
- 91. (d) The correct sequence of the plays is DBECFA.

(Qs. 92-96)

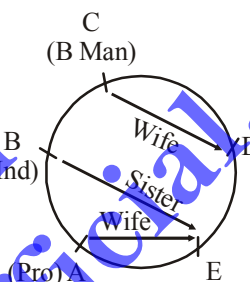
Seating arrangement is as follows:



- 92. (a)
- 93. (b)
- 94. (e)
- 95. (c)
- 96. (d)

For (Qs. 97 - 101)

The given information can be summarized as follows



A, the professor is married to E and E is the sister of B. The wife of the industrialist is D. The industrialist is seated to the right of C. Thus, A and C cannot be industrialists. Therefore, B is the industrialist and C is the businessman. Now, we come to the following deductions :

A – Professor B – Industrialist
 C – Businessman D – Female, hence unemployed
 E – Female, hence unemployed

- 97. (c) A is the husband of E and E is the sister of B. Hence, A is the brother-in-law of B.
 - 98. (d) It cannot be determined, as no information has been provided in the paragraph about the sitting position of A.
 - 99. (c) As deduced earlier, B is the industrialist.
 - 100. (d) It cannot be determined whether the industrialist is married or unmarried.
 - 101. (b) As A is a professor, he must be at least a graduate.
- (Qs. 102-106)**

- 102. (a) Either C or G has to be first and D has to come before E. Hence, E cannot finish second.
- 103. (c) F finishes second when D finishes third. Thus F finishes ahead of E.
- 104. (c) In the event of C finishing first, G finishes last and we will have the following three possible order of finishes. CFDEG, CDEFG and CDFEG.
- 105. (c) When F finishes ahead of D, than F will definitely finish at the second place.
- 106. (d) When there is exactly one golfer between C and D, then E finishes at the fourth place.



Examples :

(a) **Statement** : All tables are trees. (A)

Conclusion : Some tables are trees. (I)

(b) **Statement** : No table is tree. (E)

Conclusion : Some tables are not tree. (O)

❖ **Conversion** : In conversion, the subject becomes the predicate and the predicate becomes the subject. The quantity of the proposition remains unchanged.

Thus, A-type proposition can be converted into I-type.

E-type proposition can be converted into E-type.

I-type proposition can be converted into I-type.

But O-type proposition cannot be converted.

Examples :

(a) **Statement** : All tables are trees. (A)

Conclusion : Some trees are tables. (I)

(b) **Statement** : No table is tree. (E)

Conclusion : No tree is table. (E)

(c) **Statement** : Some tables are trees. (I)

Conclusion : Some trees are tables. (I)

Table of Distributed & Undistributed Terms			
Proposition	Symbol	Subject	Predicate
Universal Affirmative	A	Distributed	Undistributed
Universal Negative	E	Distributed	Undistributed
Particular Affirmative	I	Distributed	Undistributed
Particular Negative	O	Undistributed	Undistributed

Methods for Mediate Inference :

❖ **Format of the Conclusion** - The conclusion is itself a proposition whose subject is the subject of the first statement and whose predicate is the predicate of the second statement and the common term disappears.

Example : All dogs are cats.

All cats are bats.

Conclusion - All dogs are bats.

STEP I: Aligning : Two propositions are said to be aligned if the common term is the predicate of the first proposition and the subject of the second one.

If the sentences are not already aligned then they can be aligned by changing the order of the sentences or converting the sentences.

Example : All flowers are birds.
Subject predicate

All birds are red.
Subject predicate

Here, common term is 'birds' and it is the predicate of the first proposition and the subject of second proposition.

STEP II: After aligning the two sentences properly, use the following table to draw conclusions :

Type of I prop.		Type of II prop.		Type of conclusion
A	+	A	=	A
A	+	E	=	E
I	+	A	=	I
I	+	E	=	O
E	+	A	=	O*
E	+	I	=	O*

Here, O* means that the conclusion or inference is of type O but the subject of inference is the predicate of the second statement and the predicate of the inference is the subject of the first statement i.e. its format is opposite to the normal format of the conclusion.

REMARKS:

- There are only 6 cases where a conclusion can be drawn. In other cases, no conclusion can be drawn.
 $A + I \rightarrow$ No conclusion; $E + O \rightarrow$ No conclusion.
 $A + O \rightarrow$ No conclusion; $I + I \rightarrow$ No conclusion.
 $E + E \rightarrow$ No conclusion; $I + O \rightarrow$ No conclusion.
- If two propositions have no common term then no conclusion could be drawn.

ILLUSTRATION 1 :

Statements : (I) Some cars are roads.

(II) Some roads are buses.

Since, both statements are I-type, therefore, no immediate conclusion follows. But immediate conclusions can be followed from conversion of statements (I) and (II).

Conversion of statement I : Some roads are cars.

Conversion of statement II : Some buses are roads.

ILLUSTRATION 2 :

Statements : (I) Some men are lions.

(II) All lions are foxes.

Here, some men are lions. – I type

All lions are foxes. – A type.

Conclusion : $I + A = I$ - type

\therefore Some men are foxes.

Also, conversion of statement I : Some lions are men.

Conversion of statement II : Some foxes are lions.

and Implication of statement II : Some lions are foxes.

ILLUSTRATION 3 :

Statements : (I) All birds are books.

(II) All books are cars.

Here, both statements are of A-type.

and $A + A =$ A-type conclusion.

All birds are books.

All books are cars.

Conclusions : All birds are cars.
 Some birds are books.
 (Implication of statement I)
 Some books are cars.
 (Implication of statement II)
 Some books are birds.
 (Conversion)
 Some cars are books.
 (Conversion)

ILLUSTRATION ▶ 4 :

Statements : (I) Some dogs are cats.
 (II) No cat is cow.

Since I + E = O-type conclusion.

Conclusions : Some dogs are not cow.
 Some cats are dogs. (conversion of I)
 Some cats are not cow. (Implication of II)
 No cow is cat. (conversion of II)

ILLUSTRATION ▶ 5 :

Statements : (I) All fathers are sons.
 (II) No son is educated.

Here, A + E = E-type conclusion.

Conclusions : No father is educated.
 Some fathers are sons.
 (Implication of I)
 Some sons are fathers.
 (conversion)
 Some sons are not educated.
 (Implication of II)

ILLUSTRATION ▶ 6 :

Statements : (I) No magazine is cap.
 (II) All caps are cameras.

Since E + A = O*-type conclusion.

Conclusions : Some cameras are not magazine.
 Some caps are cameras.
 (Implication of II)
 Some magazines are not cap.
 (Implication of I)
 Some cameras are caps.
 (conversion of II)
 No cap is magazine.
 (conversion of I)

ILLUSTRATION ▶ 7 :

Statements : (I) No table is water.
 (II) Some water are clothes.

Here, E + I = O*-type conclusion.

Conclusions : Some clothes are not tables.
 Some tables are not water.
 (Implication of I)
 No water is table.
 (conversion of I)
 Some clothes are water.
 (conversion of II)

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SOLVED EXAMPLES

Directions (Example 1–5): In each question below are three statements followed by two conclusions numbered I and II. You have to take the three given statements to be true even if they seem to be at variance from commonly known facts and then decide which of the given conclusions logically follows from the three statements.

EXAMPLE 1 : Statements:

All roses are marigolds.
All marigolds are sunflowers.
Some sunflowers are jasmine.

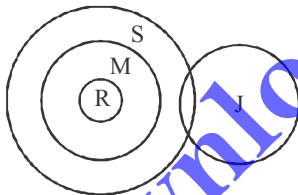
Conclusions:

I. All roses are sunflowers.
II. Some jasmines are roses.

- (a) if only conclusion I follows.
(b) if only conclusion II follows.
(c) if either I or II follows.
(d) if neither I nor II follows.
(e) if both I and II follow.

Sol. (a) First and second premises are Universal Affirmative (A-type)
Third premise is particular affirmative (I-type)
All roses are marigolds

↔
All marigolds are sunflowers
 $A + A \Rightarrow A$ -type Conclusion
"All roses are sunflowers"
These can also be solved using Venn Diagrams



EXAMPLE 2 : Statements:

Some papers are files.
All files are books.
Some books are printers.

Conclusions:

- I. Some files are printers.
II. Some books are papers.
(a) if only conclusion I follows.
(b) if only conclusion II follows.
(c) if either I or II follows.
(d) if neither I nor II follows.
(e) if both I and II follow.

Sol. (b) First and third Premises are Particular Affirmative (I-type).
Second Premise is Universal Affirmative (A-type).
Some papers are files.

↔
All files are books.
 $I + A \Rightarrow I$ -type Conclusion
 \therefore "Some papers are books"
Conclusion II is Converse of this Conclusion.

EXAMPLE 3 : Statements:

Some leaves are branches.
Some branches are trees.
Some trees are flowers.

Conclusions:

- I. Some leaves are trees.
II. Some branches are flowers.
(a) if only conclusion I follows.
(b) if only conclusion II follows.
(c) if either I or II follows.
(d) if neither I nor II follows.
(e) if both I and II follow.

Sol. (d) All the three Premises are Particular Affirmative (I-type).
No Conclusion follows from Particular Premises.

EXAMPLE 4 : Statements:

Some blades are knives.
Some knives are tables.
All tables are books.

Conclusions:

- I. Some books are knives.
II. Some books are blades.
(a) if only conclusion I follows.
(b) if only conclusion II follows.
(c) if either I or II follows.
(d) if neither I nor II follows.
(e) if both I and II follow.

Sol. (a) First and second premises are Particular Affirmative (I-type).
Third Premise is Universal Affirmative (A-type)
Some knives are tables
All tables are books
 $I + A \Rightarrow I$ type conclusion
Some book are knives
(Conversion of statement I)

EXAMPLE 5 : Statements:

All windows are houses.
All roads are houses.
Some houses are hills.

Conclusions:

- I. Some hills are windows.
II. No hill is window.
(a) if only conclusion I follows.
(b) if only conclusion II follows.
(c) if either I or II follows.
(d) if neither I nor II follows.
(e) if both I and II follow.

Sol. (c) First and second Premises are Universal Affirmative (A-type)
Third Premise is Particular Affirmative (I-type).
All windows are houses.

↔
Some houses are hills.
 $A + I \Rightarrow$ No Conclusion
Conclusions I and II are complimentary.
Therefore, either Conclusion I or Conclusion II follows.

EXERCISE

DIRECTIONS (Q. 1 - 10): In each question below, there are three of two statements followed by two conclusions numbered I and II. You have to take the three given statements to be true even if they seem to be at variance from commonly known facts and then decide which of the given conclusions logically follow from the three statements.

Give answer (a) if only conclusion I follows.

Give answer (b) if only conclusion II follows.

Give answer (c) if either I or II follows.

Give answer (d) if neither I nor II follows.

Give answer (e) if both I and II follow.

1. **Statements:** All shoes are pens.

Some pens are razors.
Some razors are desks.

Conclusions :

- I. Some desks are shoes.
II. Some razors are shoes.

2. **Statements:**

Some benches are windows.
Some windows are walls.
Some walls are trains.

Conclusions:

- I. Some trains are benches.
II. No train is bench.

3. **Statements :**

All brushes are chocolates.
All chocolates are mirrors.
All mirrors are tables.

Conclusions:

- I. Some tables are brushes
II. Some mirrors are chocolates.

4. **Statements :**

Some pencils are knives.
All knives are papers.
Some papers are books.

Conclusions:

- I. Some books are pencils.
II. Some papers are pencils.

5. **Statements:**

Some roofs are figures.
All figures are lions.
All lions are goats.

Conclusions:

- I. Some goats are roofs.
II. All goats are figures

6. **Statements:**

All fish are birds.
Some hens are fish.

Conclusion:

- I. Some hens are birds.
II. No birds are hens;

7. **Statements:**

Some shoes are coats.
Some coats are buttons

Conclusions:

- I. No button is shoe.
II. Some shoes are buttons.

8. **Statements:**

All bats are boys.
All boys are gloves.

Conclusions:

- I. Some gloves are bats.
II. All bats are gloves..

9. **Statements:**

All puppies are tigers.
All kittens are tigers.

Conclusions:

- I. All puppies are kittens.
II. All tigers are puppies.

10. **Statements:**

Some doctors are nurses.
All nurses are patients.

Conclusions:

- I. All doctors are patients.
II. Some patients are doctors.

DIRECTIONS (Q. 11-20): In each of the questions below are given three or more statements followed by three conclusions numbered I, II and III. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements.

11. **Statements:**

Some flowers are bins.
Some bins are handles.
All handles are sticks.

Conclusions.

- I. Some sticks are bins.
II. Some handles are flowers.
III. Some sticks are flowers.

- (a) Only II follows (b) Only III follows
(c) Only I and II follow (d) Only I and III follow
(e) None of these

12. **Statements:**

Some towers are windows.
All windows are houses.
Some houses are temples.

Conclusions:

- I. Some towers are temples.
II. Some houses are towers.
III. Some temples are windows

- (a) Only I follows (b) Only II follows
(c) Only III follows, (d) Only I and II follow
(e) None of these

13. **Statements:**

Some walls are doors.
Some doors are cots.
Some cots are chairs.

Conclusions:

- I. Some chairs are doors.
II. Some cots are walls.
III. No chair is door.
(I) Only II follows
(b) Only III follows
(c) Only either I or III-follows
(d) Only I follows
(e) None of these

14. **Statements:**

All trees are gardens.
All gardens are stones.
All stones are fences.

Conclusions

- I. Some fences are gardens.
II. All gardens are fences.
III. Some stones are trees.
(a) Only I and II follow
(b) Only I and III follow
(c) Only II and III follow
(d) All follow
(e) None of these

15. **Statements:**

All books are leaves.
Some leaves are jungles.
No jungle is box.

Conclusions:

- I. Some jungles are books.
II. If No book is box.
III. Some leaves are boxes.
(a) None follows (b) Only I follows
(c) Only II follows (d) Only III follows
(e) Only I and II follow

DIRECTIONS (Q. 16-20) : In each of the questions below are given four statements followed by three conclusions numbered I, II & III. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

16. **Statements:**

All chilies are garlies.
Some garlies are onions.
All onions are potatoes.
No potato is ginger.

Conclusions:

- I. No onion is ginger.
II. Some garlies are potatoes.
III. Some chillies are potatoes.
(a) Only I follows (b) Only II follows
(c) Only I & II follow (d) Only I & II follow
(e) All follow

17. **Statements:**

Some keys are locks.
Some locks are numbers.
All numbers are letters.
All letters are words.

Conclusions:

- I. Some locks are letters.
II. Some words are numbers.
III. All numbers are words.
(a) Only I & II follow
(b) Only II & III follow
(c) Only I & III follow
(d) Only I & either II or III follow
(e) All follow

18. **Statements:**

Some windows are doors.
All doors are walls.
No wall is roof.
All roofs are shelters.

Conclusions:

- I. Some windows are walls.
II. No wall is shelter.
III. No door is shelter.
(a) None follows (b) Only II and III follow
(c) Only I and III follow (d) Only I follows
(e) None of these

19. **Statements:**

All bottles are jars.
Some jars are pots.
All pots are taps.
No tap is tank.

Conclusions:

- I. No pot is tank
II. Some jars are tanks
III. Some bottles are pots.
(a) Only I & III follow (b) Only I & II follow
(c) Only II & III follow (d) All follow
(e) None of these

20. **Statements:**

Some fish are crocodiles.
Some crocodiles are snakes.
No snake is tortoise.
All tortoises are frogs.

Conclusions:

- I. No snake is frog.
II. Some snakes are fish.
III. Some fish are frogs.
(a) None follows (b) Only I & II follow
(c) Only II & III follow (d) Only I & III follow
(e) None of these

DIRECTIONS (Q. 21- 25) In each question below there are three statements followed by two conclusions numbered I and II. You have to take the three given statements to be true even if they seem to be at variance from commonly known facts and then decide which of the given conclusions logically follows from the three given statements. Then decide which of the answers (a), (b), (c), (d) and (e) is the correct answer and indicate it on the answer sheet.

Give answer (a) if only conclusion I follows.
 Give answer (b) if only conclusion II follows.
 Give answer (c) if either I or II follows.
 Give answer (d) if neither I nor II follows.
 Give answer (e) if both I and II follow.

21. **Statements:**

Some pens are books.
 All books are pencils.
 All pencils are jars.

Conclusions:

- I. All books are jars.
 II. Some pens are pencils.

22. **Statements:**

Some bowls are spoons.
 Some spoons are forks.
 All forks are plates.

Conclusions:

- I. Some bowls are forks.
 II. Some spoons are plates.

23. **Statements:**

Some bottles are jars.
 All jars are buckets.
 All buckets are tanks

Conclusions:

- I. All jars are tanks.
 II. Some buckets are tanks.

24. **Statements:**

Some phones are mobiles:
 Some mobiles are computers.
 Some computers are keys.

Conclusions:

- I. Some phones are keys.
 II. Some computers are phones.

25. **Statements:**

All papers are files.
 Some files are folders.
 All folders are bags.

Conclusions:

- I. Some files are bags.
 II. Some papers are folders.

DIRECTION (Q. 26 - 30) : In each of the questions below are given two or three statements followed by the conclusions numbered I and II. You have to take the given statements to be true even if they seem to be at variance with commonly known facts and then decide which of the given conclusions logically follows from the given statements. Give answer

- (a) if only conclusion I follows.
 (b) if only conclusion II follows.
 (c) if neither I nor II follows.
 (d) if both I and II follow.
 (e) if either I or II follows.

26. **Statements :** All toys are dolls .
 All dolls are jokers.
 Some toys are cars.

Conclusions : I. Some cars are jokers.
 II. Some dolls are cars.

27. **Statements :** All pens are boxes.
 Some boxes are blades.
 Some blades are files.

Conclusions : I. Some blades are pens.
 II. Some pens are files.

28. **Statements :** All books are ledgers.
 All pens are keys.
 Some pens are books.

Conclusions : I. Some ledgers are keys.
 II. Some keys are books.

29. **Statements :** Some roses are thorns.
 All thorns are flowers.
 No flower is a petal.

Conclusions : I. No petal is a rose.
 II. Some flowers are roses.

30. **Statements:** All leaders are good team workers.
 All good team workers are good orators.

Conclusions: I. Some good team workers are leaders.
 II. All good orators are leaders.

DIRECTIONS (Qs. 31 - 44) : In each of the questions below are given three statements followed by three or four conclusions numbered I, II, III and IV. You have to take the given statements to be true even if they seem to be at variance with commonly known facts and then decide which of the given conclusions logically follow from the given statements.

31. **Statements :** Some stones are bricks.
 All plants are stones.
 No flower is a plant.

Conclusions : I. No flower is a stone.
 II. Some bricks are plants.
 III. No bricks are plants.

- (a) Only I follows (b) Only II follows.
 (c) Only III follows. (d) Either II or III follows.
 (e) None of these

32. **Statements :** All tigers are jungles.
 No jungle is a bird.
 Some birds are rains.

Conclusions : I. No rain is a jungle.
 II. Some rains are jungles.
 III. No bird is a tiger.

- (a) Only either II or III follows.
 (b) Only I and II follow.
 (c) Only either I or II and III follow.
 (d) All I, II, and III follow.
 (e) None of these

33. **Statements :** Some pots are buckets.
 Some buckets are bags.
 Some bags are purses.

Conclusions : I. Some purses are buckets.
 II. Some bags are pots.
 III. Some purses are pots.
 IV. Some pots are bags.

- (a) All follow (b) None follows
 (c) Only I and III follow (d) Only II and IV follow

34. **Statements :** All glasses are roads.
No road is stick.
Some sticks are pens.
- Conclusions :** I. Some glasses are sticks.
II. Some pens are sticks.
III. Some roads are sticks.
IV. No glass is a stick.
- (a) None follows
(b) Only I or IV and II follow
(c) Only either I or II and IV follows
(d) None of these
35. **Statements :** Some ice are ring.
No ring is paint.
Some rings are gold.
- Conclusions :** I. No gold is paint.
II. No ice is gold.
III. Some rings are paints.
IV. All golds are ring.
- (a) None follows (b) Only I and III follow
(c) Only I and II follow (d) Only III and IV follow
36. **Statements :** No candle is bell.
Some shoes are bells.
All tables are shoes.
- Conclusions :** I. Some tables are bells.
II. No table is bell.
III. Some shoes are candles.
IV. No flower is fruit.
- (a) Only I and IV follow (b) Only I and II follow
(c) Only III and IV follow (d) None follows
37. **Statements :** Some cats are rats.
Some rats are ants.
Some ants are flies.
- Conclusions :** I. Some flies are ants.
II. Some ants are not rats.
III. No rat is fly.
IV. No cat is fly.
- (a) Only I and IV follow (b) Only II follows
(c) Only I and II follow (d) None of these
38. **Statements :** All books are notes.
Some notes are pencils.
No pencil is paper.
- Conclusions :** I. Some notes are books.
II. Some pencils are books.
III. Some books are papers.
IV. No book is a paper.
- (a) Only I and either III or IV follow
(b) Either III or IV follows
(c) Only I and III follow
(d) None of these
39. **Statements :** Some tables are chairs.
No cupboard is table.
Some chairs are cupboards.
- Conclusions :** I. Some chairs are not tables.
II. All chairs are either tables or cupboards.
III. Some chairs are tables.
IV. All chairs are tables.
- (a) Only I and IV follow
(b) Only either II or III follows
(c) Only I and III follows
(d) Either II or III and I follow
40. **Statements :** No table is fruit.
No fruit is window.
All windows are chairs.
- Conclusions :** I. No window is table.
II. No chair is fruit.
III. No chair is table.
IV. All chairs are windows.
- (a) None follows (b) All follow
(c) Only I and II follow (d) Only III and IV follow
41. **Statements :** No man is sky.
No sky is road.
Some men are roads.
- Conclusions :** I. No road is man.
II. No road is sky.
III. Some skies are men.
IV. All roads are men.
- (a) None follows (b) Only I follows
(c) Only I and III follow (d) Only II follows
42. **Statements :** All papers are books.
All bags are books.
Some purses are bags.
- Conclusions :** I. Some papers are bags.
II. Some books are papers.
III. Some books are purses.
- (a) Only I follows (b) Only II and III follow
(c) Only I and III follow (d) Only I and II follow
43. **Statements :** Some stones are bricks.
All plants are stones.
No flower is a plant.
- Conclusions :** I. No flower is a stone.
II. Some bricks are plants.
III. No bricks are plants.
- (a) Only I follows (b) Only II follows
(c) Only III follows (d) Either II or III follows
44. **Statements :** All tigers are jungles.
No jungle is a bird.
Some birds are rains.
- Conclusions :** I. No rain is a jungle.
II. Some rains are jungles.
III. No bird is a tiger.
- (a) Only either II or III follows
(b) Only I and II follow
(c) Only either I or II and III follow
(d) All I, II and III follow
(e) None of these

DIRECTIONS (45–50) : In each of the questions below are given three statements followed by three conclusions numbered I, II and III. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements.

45. **Statements:**

All petals are trees.
 All trees are gardens.
 All roads are gardens.

Conclusions:

- I. Some roads are trees.
 II. Some gardens are trees.
 III. Some gardens are petals.
 (a) Only I and II follow
 (b) Only II and III follow
 (c) Only I and III follow
 (d) All I, II and III follow
 (e) None of these

46. **Statements :**

All keys are locks.
 No lock is toy.
 All bags are toys.

Conclusions :

- I. No bag is key.
 II. Some bags are keys.
 III. Some toys are keys.
 (a) None follows (b) Only I follows
 (c) Only II follows (d) Only III follows
 (e) Only I and II follow

47. **Statements :**

Some days are nights.
 Some nights are months.
 Some months are years.

Conclusions :

- I. Some years are nights.
 II. Some months are days.
 III. No year is night.
 (a) Only I follows
 (b) Only II follows

- (c) Only III follows
 (d) Only either I or II follows
 (e) None of these

48. **Statements :**

All cycles are tyres.
 Some tyres are wheels.
 All wheels are buses.

Conclusions :

- I. Some buses are tyres.
 II. Some wheels are tyres.
 III. Some buses are cycles.
 (a) Only I and II follow (b) Only I and III follow
 (c) Only II and III follow (d) All I, II and III follow
 (e) None of these

49. **Statements :**

Some dogs are cats.
 Some cats are horses.
 All horses are tigers.

Conclusions :

- I. Some tigers are cats.
 II. Some horses are dogs.
 III. Some tigers are dogs.
 (a) None follows (b) Only I follows
 (c) Only II follows (d) Only III follows
 (e) Only II and III follow

50. **Statements :**

All ropes are sticks.
 Some sticks are hammers.
 Some hammers are lakes.

Conclusions :

- I. Some lakes are ropes.
 II. Some hammers are ropes.
 III. Some lakes are sticks.
 (a) None follows (b) Only I follows
 (c) Only II follows (d) Only III follows
 (e) Only I and III follow

ANSWER KEY									
1	(d)	11	(e)	21	(e)	31	(d)	41	(d)
2	(c)	12	(b)	22	(b)	32	(c)	42	(b)
3	(e)	13	(c)	23	(e)	33	(b)	43	(d)
4	(b)	14	(d)	24	(d)	34	(d)	44	(c)
5	(a)	15	(a)	25	(a)	35	(a)	45	(b)
6	(a)	16	(c)	26	(d)	36	(d)	46	(b)
7	(c)	17	(e)	27	(c)	37	(c)	47	(d)
8	(e)	18	(d)	28	(d)	38	(a)	48	(a)
9	(d)	19	(e)	29	(b)	39	(c)	49	(b)
10	(b)	20	(a)	30	(a)	40	(a)	50	(a)

ANSWERS & EXPLANATIONS

1. (d) All shoes are pens. (A-type)

Some pens are razors. (I-type)
 $A + I \Rightarrow$ No Conclusion

2. (c) All the three Premises are Particular Affirmative (I-type).
 No Conclusion follows from Particular Premises.
 Conclusion I and II form a Complementary Pair.
 Therefore, either I or II follows.

3. (e) All brushes are chocolates. (A-type)

All chocolates are mirrors. (A-type)
 $A + A \Rightarrow$ A-type Conclusion.
 \therefore All brushes are mirrors.
 All bushes are mirrors. (A-type)

All mirrors are tables. (A-type)
 \therefore All brushes are tables.
 Conclusion I is converse of this Conclusion.
 Conclusion II is converse of the second Premise.

4. (b) Some pencils are knives. (I-type)

All knives are papers. (A-type)

$I + A \Rightarrow$ I-type Conclusion.
 \therefore Some pencils are papers.
 Conclusion II is converse of this Conclusion.

5. (a) Some roofs are figures. (I-type)

All figures are lions. (A-type)
 $I + A \Rightarrow$ I-type Conclusion
 \therefore Some roofs are lions.
 Some roofs are lions. (I-type)

All lions are goats. (A-type)
 $I + A \Rightarrow$ I-type Conclusion.
 \therefore Some roofs are goats.
 Conclusion I is converse of this Conclusion.

6. (a) Some hens are fish. (I-Type)

All fish are birds. (A - Type)
 $I + A \Rightarrow$ I-type
 \therefore Some hens are birds.
 This is Conclusion I.

7. (c) Both the Premises are Particular Affirmative. No Conclusion follows from Particular Premises. Conclusions I and II form Complementary Pair. Therefore, either Conclusion I or II follows.

8. (e) All bats are boys. (A-Type)



All boy are gloves. (A-Type)

$A + A \Rightarrow A$ type Conclusion.

\therefore All bats are gloves.

This is Conclusion II.

Conclusion I is Converse of this Conclusion.

10. (b) Some doctors are nurses. (I-Type)



All nurses are patients. (A-Type)

$I + A \Rightarrow I$ -type Conclusion.

\therefore Some doctors are patients.

Conclusion II is Converse of this Conclusion.

11. (e) Some bins are handles. (I-Type)



All handles are sticks. (A-Type)

$I + A \Rightarrow I$ -type Conclusion.

\therefore Some bins are sticks.

Conclusion I is Converse of this Conclusion.

12. (b) Some towers are windows. (I-Type)



All windows are houses. (A-Type)

$I + A \Rightarrow I$ -type Conclusion.

\therefore Some towers are houses.

Conclusion I is Converse of this Conclusion.

13. (c) All the three Premises are Particular Affirmative (I-type)

No Conclusion follows from. Particular Premises

Conclusions I and III form a Complementary Pair.

Therefore, either I or III follows.

14. (d) All trees are gardens. (A-Type)



All gardens are stones. (A-Type)

$A + A \Rightarrow A$ -type Conclusion

\therefore All trees are stones.

Conclusion III is Converse of this Conclusion.

All gardens are stones. (A-Type)



All stones are fences. (A-Type)

$A + A \Rightarrow A$ -type Conclusion.

\therefore All gardens are fences.

Conclusion I is Converse of this Conclusion.

15. (a) Some leaves are jungles. (I-Type)



No jungle is box (E-type)

$I + E = O$ -type

\therefore Some leaves are not boxes.

16. (c) First and third Premises are Universal Affirmative (A-Type)

Second Premise is Particular Affirmative (I-type).

Fourth Premise is Universal Negative (E-type).

Some garlics are onions (I-type).



All onions are potatoes (A-type)

$I + A \Rightarrow I$ -type Conclusion.

\therefore Some garlics are potatoes.

All onions are potatoes (A-type)



No potato is ginger. (E-type)

$A + E \Rightarrow E$ -type Conclusion.

17. (e) First and second Premises are Particular Affirmative (I-Type).

Third and fourth Premises are Universal Affirmative (A-type).

Some locks are numbers (I-type).



All numbers are letters (A-type).

$I + A = I$ -type Conclusion.

\therefore Some locks are letter.

This is conclusion I.

Some locks are letter (I-type).



All letters are words. (A-type)

$I + A \Rightarrow A$ -type Conclusion.

\therefore Some locks are words. (I-type)

All letters are words. (A-type)

$A + A \Rightarrow A$ -type Conclusion.

\therefore All numbers are words.

This is conclusion III.

Conclusion II is Converse of this Conclusion.

18. (d) Some window are doors. (I-type)

↙ ↘

All doors are walls. (A-type)
 I + A = I-type Conclusion.
 ∴ Some windows are walls.
 This is Conclusion I.
 All doors are walls. (A-type)

↙ ↘

No wall is roof. (E-type)
 A + E = E-type Conclusion.
 ∴ No door is roof.
 ∴ Some shelters are not doors.
 No wall is roof. (E-type)

↙ ↘

All roofs are shelters. (A-type)
 ∴ Some shelters are not walls.

19. (e) First and third Premises are Universal Affirmative (A-type).
 Second Premise is Particular Affirmative (I-Type)
 Fourth Premise is Universal Negative (E-type)
 Some jars are pots. (I-type)

↙ ↘

All pots are taps. (A-type)
 I + A ⇒ I-type Conclusion.
 ∴ Some jars are taps.
 All pots are taps. (A-type)

↙ ↘

No tap is tank. (E-type)
 A + E = E-type Conclusion.
 ∴ No pot is tank.
 This is Conclusion I..

20. (a) First and second Premises are Particular Affirmative (I-type).
 Third Premise is Universal Negative (E-type)
 Fourth Premise is Universal Affirmative (A-type).
 Some crocodiles are snakes. (I-type)



No snake is tortoise. (E-type)
 I + E = E-type Conclusion.
 ∴ Some crocodiles are not tortoises.
 No snake is tortoise. (E-type)

↙ ↘

All tortoises are frogs. (A-type)
 E + A = O*-type Conclusion.
 ∴ Some frogs are not snakes.

21. (e) Some pens are books (I-Type)

↙ ↘

All books are pencils. (A - Type)
 I + A ⇒ I-type Conclusion.
 ∴ Some pens are pencils.
 This is Conclusion II.
 All books are pencils. (A - Type)

↙ ↘

All pencils are jars. (A - Type)
 A + A ⇒ A-type Conclusion.
 ∴ All books are jars.
 This is Conclusion I.

22. (b) Some spoons are forks. (I-Type)

↙ ↘

All forks are plates. (A - Type)
 I + A ⇒ I-type Conclusion.
 ∴ Some spoons are plates.
 This is Conclusion II.

23. (e) All jars are buckets. (A - Type)

↙ ↘

All buckets are tanks. (A - Type)
 A + A ⇒ A-type Conclusion.
 ∴ All jars are buckets.
 This is Conclusion I.
 Conclusion II is implication of third statement

25. (a) Some files are folders. (A - Type)

↙ ↘

All folders are bags. (A - Type)
 I + A ⇒ I-type Conclusion.
 ∴ Some files are bags.
 This is Conclusion I.



Sol. 26-31

26. (d) All toys are dolls. (A-type)

↔
All dolls are jokers (A-type)
All toys are jokers.

[A + A = A-type conclusion]
Some toys are cars.

Some cars are toys. (I-type)
(Conversion)
↔
All toys are jokers. (A-type)
Some cars are jokers.

(I + A = I-type conclusion)
∴ I follows.
Some cars are toys (I-type)

↔
All toys are dolls. (A-type)
Some cars are dolls.

Some dolls are cars.
(Conversion)
∴ II follows.

27. (c) Some pens are boxes.
(Implication of first statement)
Some boxes are pens.
(Conversion of first statement)
Some blades are boxes.
(Conversion of second statement)
Some files are blades.
(Conversion of third statement)
No mediate inference follows. Hence, no given
Conclusions follows.

28. (d) Some pens are books.
Some books are pens. (conversion) (I-type)

↔
All pens are keys. (A-type)
Some books are keys.
(I + A = I-type conclusion)
Some keys are books.
(Conversion)
∴ II follows.

↔
Some pens are books. (I-type)
↔
All books are ledgers. (A-type)
Some pens are ledgers.

(I + A = I-type)
Some ledgers are pens. (conversion) (I-type)

↔
All pens are keys. (A-type)
Some ledgers are keys.
(I + A = I-type)
∴ I follows.

29. (b) Some roses are thorns. (A-type)

↔
All thorns are flowers. (A-type)
Some roses are flowers.
(I + A = I-type)
Some flowers are roses. (conversion)
Hence, II follows.
No flower is petal. (E-type)
No petal is flower. (conversion)

↔
Some flowers are roses.
Some roses are not petals. (E + I = O*-type)
Hence, I does not follow.

30. (a) All leaders are good team workers.
Some good team workers are leaders. (Conversion)
Hence, I follows.
All good team workers are good orators.
Some good orators are good team workers. (conversion)
Hence, II does not follow.

31. (d) Some stones are bricks. (I-type)

↔
Some bricks are stones. (conversion)
All plants are stones.
Some plants are stones. (Implication)
Some stones are plants. (conversion)
No flower is plant.
Some flowers are not plant. (Implication)
No plant is flower. (Conversion)
No flower is plant.
All plants are stones.
Some stones are not flower. (E + A = O* type)
Since II and III form a complementary I-E pair, either of the two must follow.

32. (c) All tigers are jungles.
Some tigers are jungles. (Implication)
Some jungles are tigers. (conversion)
No jungle is bird.
Some jungles are not bird. (Implication) (I-type)

↔

No bird is jungle. (conversion)
 Some birds are rains.
 Some rains are birds. (conversion)
 All tigers are jungles.

↔
 No jungle is bird.
 No tiger is bird.
 (A + E = E-type)
 No bird is tiger. (Conversion)
 Hence III follows.
 No jungle is bird.
 Some birds are rains.
 Some rains are not jungle.
 (E + I = O* type)
 Since I and II form a complementary E-I pair, either of the two must follow.

For (Qs. 33–37)

33. (b) Some buckets are pots. (Conversion)
 Some bags are buckets. (Conversion)
 Some purses are bags. (Conversion)
 No mediate inference follows.
 ∴ No given **Conclusions** follow.
34. (d) All glasses are roads. (A-type)
 ↔
 No road is stick. (E-type)
 No glass is stick. (A + E = E-type)
 ↔
 Some sticks are pens. (I-type)
 Pens are not glass. (E + I = O* type)
 No road is stick. (E-type)
 ↔
 Some sticks are pens.
 Some pens are not road. (I-type)
 (E + I = O* type)
 Hence only IV follows.
35. (a) Some ice are ring. (I-type)
 Some ring are ice. (conversion)
 Some rings are gold.
 Some gold are ring. (Conversion) (I-type)
 ↔
 No ring is paint. (E-type)
 Some gold are not paint. (I + E = O-type)
 Some ice are ring. (I-type)
 ↔
 No ring is paint. (E-type)
 Some ice are not paint. (I + E = O-type)
 No ring is paint.
 No paint is ring. (Implication)
 Hence none follows.

36. (d) Some shoes are bells.
 Some bells are shoes. (conversion)
 No candle is bell. (E-type)
 ↔
 Some bells are shoes. (I-type)
 Some shoes are not candle. (E + I = O*)
 All tables are shoes.
 Some tables are shoes. (Implication)
 Some shoes are tables. (Conversion)
 No candle is bell.
 No bell is candle. (conversion)
 Hence none follow.
37. (c) Some cats are rats.
 Some rats are cats. (Conversion)
 Some rats are ants.
 Some ants are rats (Conversion)
 Some ants are flies.
 Some flies are ants. (Conversion)
 No mediate inference follows.
 Hence, only I and II follow.
38. (a) All books are notes.
 Some books are notes. (Implication)
 Some notes are books. (Conversion)
 Hence I follows.
 Some notes are pencils.
 No pencil is paper.
 Some notes are not paper. (I + E = O type)
 Some notes are pencils.
 Some pencils are notes. (Conversion)
 No pencil is paper.
 Some pencils are not papers. (Implication)
 No paper is pencil. (Conversion)
 Since III and IV form a complementary I-E pair, either of the two must follow.
39. (c) Some tables are chairs.
 Some chairs are tables. (Conversion)
 Hence, III follows.
 No cupboard is table.
 Some cupboards are not table. (Implication)
 No table is cupboard. (Conversion)
 Some chairs are cupboards.
 Some cupboards are chairs. (Conversion)
 Since no table is cupboard.
 Some cupboards are chairs.
 Some chairs are not table. (E + I = O* type)
 Hence, I follows.
40. (a) No table is fruit.
 Some tables are not fruit. (Implication)
 No fruit is table. (Conversion)
 No fruit is window.

- Some fruits are not window. (Implication)
 No window is fruit. (Conversion)
 No fruit is window
 All windows are chairs.
 Some chairs are not fruit. (E + A = O* type)
 All windows are chairs.
 Some windows are chairs. (Implication)
 Some chairs are windows. (Conversion)
 Hence none follows.
41. (d) No man is sky.
 Some men are not sky. (Implication)
 No sky is man. (Conversion)
 No sky is road.
 Some skies are not road. (Implication)
 No road is sky. (Conversion)
 Hence II follows.
 Some men are roads.
 Some roads are men. (Conversion)
 No sky is man. (E-type)
- ↙ ↘
- Some men are roads. (I-type)
 Some roads are not sky. (E + I = O* type)
 No sky is road. (E-type)
- ↙ ↘
- Some roads are men. (I-type)
 Some men are not sky. (E + I = O* type)
 Some men are roads. (I-type)
- ↙ ↘
- No road is sky. (E-type)
 Some men are not sky. (I + E = O type)
 Some roads are man. (I-type)
- ↙ ↘
- No man is sky. (E-type)
 Some roads are not sky. (I + E = O type)
 Hence, only II follows
42. (b) All papers are books.
 Some papers are books. (Implication)
 Some books are papers. (Conversion)
 Hence II follows.
 All bags are books.
 Some bags are books. (Implication)
 Some books are bags. (Conversion)
 Some purses are bags.
 Some bags are purses. (Conversion)
 Some purses are bags. (I-type)
- ↙ ↘
- All bags are books. (A-type)
 Some purses are books. (I + A = I-type)
- Some books are purses. (Conversion)
 Hence, III follows.
43. (d) Some stones are bricks.
 Some bricks are stone. (Conversion)
 All plants are stones.
 Some plants are stones. (Implication)
 Some stones are plants. (Conversion)
 No flower is plant.
 Some flowers are not plant. (Implication)
 No plant is flower. (Conversion)
 No flower is plant.
 All plants are stones.
 Some stones are not flower. (E + A = O* type)
 Since II and III form a complementary I-E pair, either of the two must follow.
44. (c) All tigers are jungles.
 Some tigers are jungles. (Implication)
 Some jungles are tigers. (conversion)
 No jungle is bird.
 Some jungle are not bird. (Implication)
 No bird is jungle. (conversion)
 Some birds are rains.
 Some rains are birds. (conversion)
 All tigers are jungles. (A-type)
- ↙ ↘
- No jungle is bird. (E-type)
 No tiger is bird. (A + E = E-type)
 No bird is tiger. (Conversion)
 Hence III follows.
 No jungle is bird.
 Some birds are rains.
 Some rains are not jungle. (E + I = O* type)
 Since I and II form a complementary E-I pair, either of the two must follow.
- (45-50).**
- (i) All petals are trees → Universal Affirmative (A-type).
 (ii) Some days are nights → Particular Affirmative (I-type).
 (iii) No lock is toy → Universal Negative (E-type).
 (iv) Some locks are not toys → Particular Negative (O-type)
45. (b) All petals are trees. (A-type)
- ↙ ↘
- All trees are gardens. (A-type)
 A + A ⇒ A-type of Conclusion.
 ∴ All petals are gardens.
 Conclusion III is Converse of it.
 Conclusion II is Converse of the second premise.

46. (b) All keys are locks. (A-type)



No lock is toy. (E-type)

$A + E \Rightarrow$ E-type of Conclusion.

\therefore No key is toy.

All bags are toys. (A-type)



No toy is lock. (E-type)

$A + E \Rightarrow$ E-type of Conclusion.

\therefore No bag is lock.

All bags are toys. (A-type)



No toy is key. (E-type)

$A + E \Rightarrow$ E-type of Conclusion.

\therefore No bag is key.

This is Conclusion I.

47. (d) All the three Premises are Particular Affirmative (I-type).

No Conclusion follows from the two Particular Premises.

Conclusions I and III form complementary pair.

Therefore, either I or III follows.

48. (a) Some tyres are wheels. (I-type)



All wheels are buses. (A-type)

$I + A \Rightarrow$ I-type of Conclusion.

\therefore Some tyres are buses.

Conclusion I is Converse of it.

Conclusion II is Converse of the second premise.

49. (b) Some cats are horses. (I-type)



All horses are tigers. (A-type)

$I + A \Rightarrow$ I-type of Conclusion.

\therefore Some cats are tigers.

Conclusion I is Converse of it.

50. (a) All ropes are sticks. (A-type)



Some sticks are hammers. (I-type)

$A + I \Rightarrow$ No Conclusion.

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MATHEMATICAL OPERATION

CHAPTER 11

MATHEMATICAL OPERATION

In such type of questions some relationships are shown with the help of certain symbols/notations and/ or mathematical signs. Each symbol or sign is defined clearly in the question statement itself and we have to solve the questions accordingly.

For example,

Suppose the triangle (Δ) means addition.

We know that triangle is a plane figure but here it has been assigned the value of addition (+). Thus,

$$3 \Delta 5 \Rightarrow 3 + 5 = 8$$

To work out such questions substitute the assigned/ implied meanings of the symbol or sign and proceed accordingly. Do not consider its real meaning and follow the BODMAS rule.

Types of Questions

► Type I Value of the Given Expression

ILLUSTRATION 1 : If ' \div ' means '+', ' $-$ ' means ' \div ', ' \times ' means ' $-$ ' and ' $+$ ' means ' \times ' then $\rightarrow 62 \div 8 - 4 \times 12 + 4 = ?$

- (a) 16 (b) 26
(c) $\frac{1}{16}$ (d) 6
(e) None of these

Sol. (a) Given expression is

$$62 \div 8 - 4 \times 12 + 4 = ?$$

According to the questions, after replacement of mathematical signs, we get

$$62 + 8 \div 4 - 12 \times 4 = ?$$

$$= 64 - 48 = 16$$

hence, $? \Rightarrow 16$

► Type II Identification of Correct Equation Amongst the given Equations

ILLUSTRATION 2 : If ' $-$ ' means '+', ' $+$ ' means ' $-$ ', ' \times ' means ' \div ' and ' \div ' means ' \times '; then which of the given equations is correct ?

- (a) $30 + 5 - 4 \div 10 \times 5 = 58$

(b) $30 + 5 \div 4 - 10 \times 5 = 22$

(c) $30 - 5 + 4 \div 10 \times 5 = 62$

(d) $30 \times 5 - 4 \div 10 + 5 = 41$

(e) None of these

Sol. (d) From option 'd'

$$30 \times 5 - 4 \div 10 + 5 = 41$$

According to the question, after replacement of mathematical signs, we get

$$30 \div 5 + 4 \times 10 - 5 = 41$$

$$= 6 + 40 - 5 = 41$$

$$= 46 - 5 = 41$$

hence option (d) is correct.

MATHEMATICAL STATEMENTS

Mathematical Statements are the combination of mathematical signs, symbols, or letters which are based on certain mathematical rules.

For example :

' $P < Q$ ' means 'P is smaller than Q'.

' $P \leq Q$ ' means 'P is either smaller than or equal to Q'.

' $P > Q$ ' means 'P is greater than Q'.

' $P \geq Q$ ' means 'P is either greater than or equal to Q'.

' $P = Q$ ' means 'P is equal to Q'.

Conclusions: conclusion is the last main division of a discourse, usually containing a summing up of the points of given statement.

For example :

$A > B, C > A$

Conclusions:

I. $C > B$

II. $C = B$

After combining the above statements, we find that

$$C > A > B$$

Here C is greater than both of A and B but C is not equal to B. Hence conclusion II is incorrect.

SOLVED EXAMPLES

EXAMPLE ▶ 1 : If 'M' means ' \div ', R means '+', T means '-' and 'K' means ' \times ' then what will be the value of the following expression?

$$20 R 16 K 5 M 10 T 8 = ?$$

- (a) 36 (b) 20
(c) 36.5 (d) 12
(e) None of these

Sol. (b) $? = 20 + 16 \times 5 \div 10 - 8$

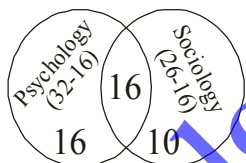
$$\text{or } ? = 20 + 16 \times \frac{5}{10} - 8$$

$$\text{or } ? = 20 + 8 - 8 = 20$$

EXAMPLE ▶ 2 : Of the two subjects offered to a class in their final year, 32 students in all are studying Psychology while a total of 26 students are studying Sociology. If 16 students have opted to specialize in both, what is the strength of the class?

- (a) 74 (b) 58
(c) 42 (d) Date inadequate
(e) None of these

Sol. (c) Venn diagram of the given information would be as follows.



$$\text{Total strength of the class} = 16 + 16 + 10 = 42$$

DIRECTIONS (Example 3-6) : In these questions symbols @, ©, %, \$ and ★ are used with different meanings as follows:

- 'P © Q' means P is smaller than Q.
'P @ Q' means P is either smaller than or equal to Q.
'P % Q' means P is greater than Q.
'P \$ Q' means P is either greater than or equal to Q.
'P ★ Q' means P is equal to Q.

In each of the following questions, assuming the given statements to be true, find out which of the two conclusions I and II given below them is/are definitely true.

- Give answer (a) if only conclusion I is true.
Give answer (b) if only conclusion II is true.
Give answer (c) if either conclusion I or conclusion II is true.
Give answer (d) if neither conclusion I nor conclusion II is true.
Give answer (e) if both conclusions I and II are true.

EXAMPLE ▶ 3 : Statements: M ★ R, R % T, T \$ K

- Conclusions : I. K @ M
II. K © M

Sol. (b) Statements: M ★ R \Rightarrow M = R
R % T \Rightarrow R > T

and T \$ K \Rightarrow T \geq K

$$\therefore M = R > T \geq K$$

Conclusions :

I. K @ M \Rightarrow K \leq M (False)

II. K © M \Rightarrow K < M (True)

EXAMPLE ▶ 4 : Statements: W © D, D @ H, H ★ N

Conclusions : I. N \$ D

II. W © N

Sol. (e) Statements: W © D \Rightarrow W < D

D @ H \Rightarrow D \leq H

and H ★ N \Rightarrow H = N

$$\therefore W < D \leq H = N$$

Conclusions :

I. N \$ D \Rightarrow N \geq D (True)

II. W © N \Rightarrow W < N (True)

EXAMPLE ▶ 5 : Statements: W @ D, D \$ R, R © K

Conclusions : I. R ★ W

II. R % W

Sol. (d) Statements: W @ D \Rightarrow W \leq D

D \$ R \Rightarrow D \geq R

and R © K \Rightarrow R < K

$$\therefore W \leq D \geq R < K$$

Conclusions :

I. R ★ W \Rightarrow R = W (False)

II. R % W \Rightarrow R > W (False)

EXAMPLE ▶ 6 : Statements : F \$ J, J % V, V © N

Conclusions : I. N \$ F

II. N % J

Sol. (d) Statements : F \$ J \Rightarrow F \geq J

J % V \Rightarrow J > V

and V © N \Rightarrow V < N

$$\therefore F \geq J > V < N$$

Conclusions :

I. N \$ F \Rightarrow N \geq F (False)

II. N % J \Rightarrow N > J (False)

EXAMPLE ▶ 7 : How many numbers would remain if the numbers which are divisible by 2 and also those having '2' as only one of the digits are dropped from numbers 1 to 30?

- (a) 14 (b) 17
(c) 15 (d) 16
(e) None of these

Sol. (e) 1, $\boxed{2}$, $\boxed{3}$, $\boxed{4}$, $\boxed{5}$, $\boxed{6}$, $\boxed{7}$, $\boxed{8}$, $\boxed{9}$, $\boxed{10}$, $\boxed{11}$, $\boxed{12}$,
 $\boxed{13}$, $\boxed{14}$, $\boxed{15}$, $\boxed{16}$, $\boxed{17}$, $\boxed{18}$, $\boxed{19}$, $\boxed{20}$, $\boxed{21}$,
 $\boxed{22}$, $\boxed{23}$, $\boxed{24}$, $\boxed{25}$, $\boxed{26}$, $\boxed{27}$, $\boxed{28}$,
 $\boxed{29}$, $\boxed{30}$

Hence, Remaining numbers are 10.

EXERCISE

1. '+' means '×', '-' means '÷', '÷' means '+' and '×' means '-'; then what will be the value of the following expression?
 $540 - 36 + 12 \div 75 \times 55$
 (a) 255 (b) 512
 (c) 180 (d) 235
 (e) None of these
2. If '-' means addition, '×' means subtraction, '÷' means multiplication and '+' means division; then what will be the value of the following expression?
 $20 \times 12 + 4 - 16 \div 5 = ?$
 (a) 17 (b) 80
 (c) 63 (d) 97
 (e) None of these
3. If '+' means '÷', '÷' means '×', '×' means '-' and '-' means '+'; then what will be the value of the following expression?
 $15 \div 5 \times 9 + 3 - 6 = ?$
 (a) 78 (b) 72
 (c) 28 (d) 30
 (e) None of these
4. 'P' indicates '+', 'R' indicates '÷', 'T' indicates '-' and 'W' indicates '×'; then what will be the value of the following expression?
 $40 R 8 W 10 T 12 P 16 = ?$
 (a) 50 (b) 43
 (c) 30 (d) 70
 (e) None of these
- Directions (Q.5-9):** These questions are based on the following information:
-
- 'A @ B' means 'A is added to B'.
 'A ★ B' means 'A is multiplied by B'.
 'M # B' means 'A is divided by B'.
 'A \$ B' means 'B is subtracted from A'.
 In each question, some information is given. You have to find out which expression correctly represents the statement.
-
5. Total age of 12 boys is 'X' and the total age of 13 girls is 'Y'. What is the average age (A) of all the boys and girls together?
 (a) $A = (X @ Y) \# 25$ (b) $A = (X \$ Y) \# 25$
 (c) $A = (X @ Y) \star 25$ (d) Cannot be determined
 (e) None of these
6. Population of state M (P_1) is less than half of population of state N (P_2) by 1,50,000.
 (a) $P_2 = (P_1 \# 2) \$ 1,50,000$
 (b) $P_1 = (P_2 \# 2) @ 1,50,000$
 (c) $P_1 = (P_2 \# 2) \$ 1,50,000$
 (d) $P_2 = (P_1 \# 2) @ 1,50,000$
 (e) None of these
7. Number of boys (B) in a class is equal to one-fourth of three times the number of girls (G) in the class.
 (a) $B = (3 \# G) \star 4$ (b) $B = (3 \star G) @ 4$
 (c) $B = (3 \star G) \# 4$ (d) $B = (3 \$ G) \# 4$
 (e) None of these
8. Salary of Mr. X (S_1) is more than 40% of Mr. Y's salary (S_2) by Rs 8,000.
 (a) $S_1 = [S_2 \star (40 @ 100)] \# 8,000$
 (b) $S_1 = [S_2 \star (40 \# 100)] @ 8,000$
 (c) $S_2 = [S_1 \star (40 \# 100)] @ 8,000$
 (d) $S_2 = [S_1 \star (40 @ 100)] \# 8,000$
 (e) None of these
9. Marks obtained by Sujit in History (H) are 85% of his marks obtained in Science (M).
 (a) $H = (100 \# 85) \star M$ (b) $H = 85 \star 100 \star M$
 (c) $H = 85 \# 100 \# M$ (d) $H = (85 \# 100) \star M$
 (e) None of these
10. If '★' means '×', '\$' means '+', '#' means '÷' and '©' means '-'; then what will be the value of the following expression?
 $360 \# 24 \$ 56 \star 5 © 48$
 (a) 253 (b) 242
 (c) 247 (d) 285
 (e) None of these
11. Out of 38 families in a housing society 5 subscribe to Hindi newspapers alone, 12 subscribe to both Hindi and Marathi newspapers. Find the number of Marathi newspaper subscribers.
 (a) 9 (b) 21
 (c) 17 (d) Cannot be determined
 (e) None of these.
12. If '+' means '×', '×' means '-', '÷' means '+' and '-' means '÷', then what will be the value of the following expression?
 $288 - 32 + 6 \times 45 \div 9 = ?$
 (a) 0 (b) 18
 (c) 9 (d) 81
 (e) None of these

13. If '#' means '+', '★' means '÷', '@' means '×' and '\$' means '-' then what will be the value of the following expression?
'40 \$ 20 @ 2 # 40 ★ 20 # 38'

- (a) 44 (b) $\frac{40}{58}$
(c) 40 (d) $\frac{44}{58}$
(e) None of these

14. If 'P' means 'divided by', 'R' means 'multiplied by', 'T' means 'added to' and 'W' means 'subtracted from', then
 $60 T 48 P 8 W 6 R 9 = ?$

- (a) 12 (b) $61\frac{1}{23}$
(c) $-40\frac{1}{2}$ (d) 24
(e) None of these

15. 'A □ B' means 'A' is multiplied by 'B', 'A • B' means 'A is divided by B', 'A ? B' means 'B is added to A' and 'A = B' means, 'B is subtracted from A' then what will be the value of the following expression?

$$'10 \square 10 = 5 \square 10 ? 50 \bullet 10'$$

- (a) 100 (b) 10
(c) 1000 (d) 60
(e) None of these

DIRECTIONS (Q. 16-20): In the following questions, the symbols ©, \$, %, @ and # are used with the following meaning as illustrated below:

'P @ Q' means P is neither greater than nor equal to Q.

'P \$ Q' means P is not smaller than Q.

'P # Q' means P is neither smaller than nor greater than Q.

'P © Q' means P is not greater than Q.

'P % Q' means P is neither smaller than nor equal to Q'.

Now in each of the following questions assuming the given statements to be true, find which of the two, conclusions I and II given below them is/are definitely true?

Give answer (a) if only Conclusion I is true.

Give answer (b) if only Conclusion II is true.

Give answer (c) if either Conclusion I or II is true.

Give answer (d) if neither Conclusion I nor II is true.

Give answer (e) if both Conclusions I and II are true.

16. **Statements:** J # R, R % K, K @ D

- Conclusions:** I. K @ J
II. D @ J

17. **Statements:** M © T, K % T, K @ N

- Conclusions:** I. N % M
II. K % M

18. **Statements:** V \$ D, D © R, R % F

- Conclusions:** I. R % V
II. V @ F

19. **Statements:** B @ E, E # S, S \$ Z

- Conclusions:** I. Z @ E
II. E # Z

20. **Statements:** H % M, N © M, N \$ T

- Conclusions:** I. H # T
II. H % T

DIRECTIONS (Q. 21-25) : In the following questions, the symbols @, #, \$, © and % are used with the following meaning as illustrated below:

'P @ Q' means 'P is not smaller than Q',

'P # Q' means 'P is not greater than Q'.

'P \$ Q' means 'P is neither greater than nor equal to Q'.

'P © Q' means 'P is neither smaller than nor equal to Q'.

'P % Q' means 'P is neither smaller than nor greater than Q'.

Now in each of the following questions, assuming the given statements to be true, find which of the two conclusions I and II given below them is/are definitely true.

Give answer (a) if only conclusion I is true.

Give answer (b) if only conclusion II is true.

Give answer (c) if either conclusion I or conclusion II is true.

Give answer (d) if neither conclusion I nor conclusion II is true.

Give answer (e) if both conclusions I and II are true.

21. **Statements:** : V \$ W, W @ T, T # H

- Conclusions:** I. V © T
II. H % W

22. **Statements:** H © M, M @ E, E \$ C

- Conclusions:** I. C @ M
II. H © E

23. **Statements:** N @ J, J % R, R © H

- Conclusions:** I. R # N
II. N © H

24. **Statements:** L @ K, K © A, A \$ W

- Conclusions:** I. W \$ L
II. L # W

25. **Statements:** J # R, R © D, D @ F

- Conclusions:** I. F \$ R
II. F % R

DIRECTIONS (Q. 26-30): In these questions symbols ©, #, *, \$ and @ are used with different meanings as follows:

- 'A ©B' means 'A is smaller than B'.
 - A #B means 'A is either smaller, than or equal to B'.
 - 'A * B' means 'A is greater than B'.
 - A \$B means 'A is either greater than or equal to B'.
 - A @B means 'A is neither smaller than nor greater than B'.
- In each of the following questions assuming the given statements to be true, find out which of the two conclusions I and II given below them is/are definitely true.
- Give answer (a) if only conclusion I is true.
 Give answer (b) if only conclusion II is true.
 Give answer (c) if either conclusion I or conclusion II is true.
 Give answer (d) if neither conclusion I nor conclusion II is true.
 Give answer (e) if both conclusions I and II are true.

26. **Statements:** V # S, S © L, L © J
Conclusions: I. V © L
 II. S © J
27. **Statements:** M # R, R © J, J # H
Conclusions: I. M # H
 II. R © H
28. **Statements:** H \$ F, F @ G, G ★ M
Conclusions: I. H ★ M
 II. H ★ G
29. **Statements:** R © J, J ★ T, T # L
Conclusions: I. R @ T
 II. J @ L
30. **Statements:** W @ T, T \$ K, K ★ F
Conclusions: I. W \$ K
 II. W @ K

ANSWER KEY

1	(e)	8	(b)	15	(e)	22	(b)	29	(d)
2	(d)	9	(d)	16	(a)	23	(e)	30	(a)
3	(a)	10	(c)	17	(e)	24	(d)		
4	(e)	11	(e)	18	(d)	25	(d)		
5	(a)	12	(b)	19	(c)	26	(e)		
6	(c)	13	(c)	20	(b)	27	(b)		
7	(c)	14	(a)	21	(d)	28	(a)		

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ANSWERS & EXPLANATIONS

1. (e) $? = 540 \div 36 \times 12 + 75 - 55$
 or $? = 15 \times 12 + 75 - 55$
 or $? = 180 + 75 - 55 = 200$

2. (d)

-	⇒	+	×	⇒	-
÷	⇒	×	+	⇒	÷

 $20 \times 12 + 4 - 16 \div 5 = ?$
 or $? = 20 - 12 \div 4 + 16 \times 5$
 or $? = 20 - 3 + 80 = 97$

3. (a) $15 \div 5 \times 9 + 3 - 6 = ?$
 or $? = 15 \times 5 - 9 \div 3 + 6$
 or $? = 15 \times 5 - 3 + 6$
 or $? = 81 - 3 = 78$

4. (e) $40 R 8 W 10 T 12 P 16 = ?$
 or $? = 40 \div 8 \times 10 - 12 + 16$
 or $? = 5 \times 10 - 12 + 16$
 or $? = 66 - 12 = 54$

5. (a) Average age of all boys and girls

$$(A) = \frac{X+Y}{25}$$

$$\Rightarrow A_1 = (x @ y) \# 25$$

6. (c) $P_1 = \frac{P_2}{2} - 1,50,000$

$$\Rightarrow P_1 = (P_2 \# 2) \$ 150000$$

7. (c) $B = \frac{1}{4} \times 3G = \frac{3G}{4}$

$$\Rightarrow B = (3 \star G) \# 4$$

8. (b) $S_1 = \frac{40}{100} \times S_2 + 8,000$

$$\Rightarrow S_1 = [S_2 \star (40 \# 100)] @ 8,000$$

9. (d) $H = \frac{85}{100} \times M$

$$\Rightarrow H = (85 \# 100) \star M$$

10. (c) $? = 360 \div 24 + 56 \times 5 - 48$
 $\Rightarrow ? = 15 + 280 - 48 = 247$

11. (e) Hindi

5	12	21
---	----	----

 Marathi

$$38 = 5 + n(B) - 12$$

Number of people who take Marathi Newspaper
 $= 12 + 21 = 33 \therefore m(B) = 38 + 12 - 5 = 45$

45 subscribe to marathi newspaper 45 - 12 (both) = 33
 subscribe only for Marathi newspaper.

12. (b) $? = 288 \div 32 \times 6 - 45 + 9$
 or $? = 9 \times 6 - 45 + 9$
 or $? = 54 - 45 + 9 = 18$

13. (c) $40 \$ 20 @ 2 \# 40 \star 20 \# 38$
 $40 - 20 \times 2 + 40 \div 20 + 38$
 $= 40 - 20 \times 2 + \frac{40}{20} + 38$
 $= 40 - 40 + 2 + 38$

14. (a) $60 T 48 P 8 W 6 R 9 = ?$
 $\Rightarrow 60 + 48 \div 8 - 6 \times 9 = ?$
 $\Rightarrow 60 + 6 - 54 = ?$
 $\Rightarrow 12 = ?$

15. (e) $10 \uparrow 10 = 5 \uparrow 10 ? 50 \bullet 10$
 $= 10 \times 10 - 5 \times 10 + 50 \div 10$

$$10 \times 10 - 5 \times 10 + \frac{50}{10}$$

$$= 100 - 50 + 5$$

$$= 55$$

For (Qs 16-20):

- (i) $P @ Q \Rightarrow P \not> Q$ and $P \neq Q$
 hence $P < Q$
- (ii) $P \$ Q \Rightarrow P \not< Q$
 hence $P > Q$ and $P = Q \Rightarrow P \geq Q$
- (iii) $P \# Q \Rightarrow P \not< Q$ and $P \not> Q$
 hence $P = Q$
- (iv) $P \odot Q \Rightarrow P \not> Q$
 hence $P \geq Q$
 or $P \leq Q$
- (v) $P \% Q \Rightarrow P \not< Q$ and $P \neq Q$
 hence $P > Q$

@	⇒	<	\$	⇒	≥
#	⇒	=	⊙	⇒	≤
%	⇒	>			

16. (a) Statements

$$J \# R \Rightarrow J = R$$

$$R \% K \Rightarrow R > K$$

$$K @ D \Rightarrow K < D$$

hence,

$$J = R > K < D$$

Conclusions : I. $K @ J \Rightarrow K < J$ (True)

II. $D @ J \Rightarrow D < J$ (False)

17. (e) Statements

$$M \odot T \Rightarrow M \leq T$$

$$K \% T \Rightarrow K > T$$

$$K @ N \Rightarrow K < N$$

hence,

$$M \leq T < K < N$$

Conclusions

I. $N \% M \Rightarrow N > M$ (True)

II. $K \% M \Rightarrow K > M$ (True)

18. (d) Statements

$$V \$ D \Rightarrow V \geq D$$

$$D \odot R \Rightarrow D \leq R$$

$$R \% F \Rightarrow R > F$$

hence,

$$V \geq D \leq R > F$$

Conclusions

I. $R \% V \Rightarrow R > V$ (False)

II. $V @ F \Rightarrow V < F$ (False)

19. (c) Statements

$$B @ E \Rightarrow B < E$$

$$E \# S \Rightarrow E = S$$

$$S \$ Z \Rightarrow S \geq Z$$

hence,

$$B < E = S \geq Z$$

Conclusions

I. $Z @ E \Rightarrow Z < E$ (False)

II. $E \# Z \Rightarrow E = Z$ (False)

Z is either smaller than E or equal to E

20. (b) Statements

$$H \% M \Rightarrow H > M$$

$$N \odot M \Rightarrow N \leq M$$

$$N \$ T \Rightarrow N \geq T$$

hence,

$$H > M \geq N \geq T$$

Conclusions

I. $H \# T \Rightarrow H = T$ (False)

II. $H \% T \Rightarrow H > T$ (True)

21. (d) $V \$ W \Rightarrow V < W$

$$W @ T \Rightarrow W \geq T$$

$$T \# H \Rightarrow T \leq H$$

hence $V < W \geq T \leq H$

Conclusions :

I. $V \odot T \Rightarrow V > T$ (False)

II. $H \% W \Rightarrow H = W$ (False)

22. (b) $H \odot M \Rightarrow H > M$

$$M @ E \Rightarrow M \geq E$$

$$E \$ C \Rightarrow E < C$$

hence, $H > M \geq E < C$

Conclusions :

I. $C @ M \Rightarrow C \geq M$ (False)

II. $H \odot E \Rightarrow H > E$ (True)

23. (e) $N @ J \Rightarrow N \geq J$

$$J \% R \Rightarrow J = R$$

$$R \odot H \Rightarrow R > H$$

hence, $N \geq J = R > H$

Conclusions :

I. $R \# N \Rightarrow R \leq N$ (True)

II. $N \odot H \Rightarrow N > H$ (True)

24. (d) $L @ K \Rightarrow L \geq K$

$$K \odot A \Rightarrow K > A$$

$$A \$ W \Rightarrow A < W$$

hence, $L \geq K > A < W$

Conclusions : I. $W \$ L \Rightarrow W < L$ (False)

II. $L \# W \Rightarrow L \leq W$ (False)

25. (d) $J \# R \Rightarrow J \leq R$

$$R \odot D \Rightarrow R > D$$

$$D @ F \Rightarrow D \geq F$$

hence, $J \leq R > D \geq F$

Conclusions:

I. $F \$ R \Rightarrow F < R$ (False)

II. $F \% R \Rightarrow F = R$ (False)

26. (e) $V \# S \Rightarrow V \leq S$

$$S \odot L \Rightarrow S < L$$

$$L \odot J \Rightarrow L < J$$

hence $V \leq S < L < J$

Conclusions

I. $V \odot L \Rightarrow V < L$ (True)

II. $S \odot J \Rightarrow S < J$ (True)

27. (b) $M \# R \Rightarrow M \leq R$

$$R \odot J \Rightarrow R < J$$

$$J \# H \Rightarrow J \leq H$$

hence $M \leq R < J \leq H$

Conclusions

I. $M \# H \Rightarrow M \leq H$ (False)

II. $R \odot H \Rightarrow R < H$ (True)

28. (a) $H \$ F \Rightarrow H \geq F$
 $F @ G \Rightarrow F = G$
 $G \star M \Rightarrow G > M$
 hence $H \geq F = G > M$

Conclusions

- I. $H \star M \Rightarrow H > M$ (True)
 II. $H \star G \Rightarrow H > G$ (False)

29. (d) $R \odot J \Rightarrow R < J$
 $J \star T \Rightarrow J > T$
 $T \# L \Rightarrow T \leq L$
 hence $R < J > T \leq L$

Conclusions

- I. $R @ T \Rightarrow R = T$ (False)
 II. $J @ L \Rightarrow J = L$ (True)

30. (a) $W @ T \Rightarrow W = T$

$$T \$ K \Rightarrow T \geq K$$

$$K \star F \Rightarrow K > F$$

$$\text{hence } W = T \geq K > F$$

Conclusions

- I. $W \$ K \Rightarrow W \geq K$ (True)
 II. $W @ K \Rightarrow W = K$ (False)

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NON-VERBAL REASONING

CHAPTER 12

COMPLETION OF SERIES

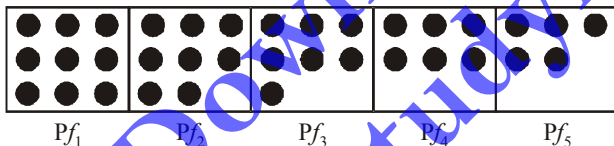
Non-Verbal Reasoning is a very important section. In the questions of this section a series of figures is given as problem figures and students are asked to select one of the figures from the set of answer figures which will continue the sequence.

In order to solve these questions, students are supposed to have a clear vision of different movements, addition/deletion of figures and Rotation. The movement of a block (figure) around a fixed point is known as rotation. The simplest example of rotation is the movement of hour and minute hands of a clock. When a body rotates in the direction of the hands of the clock, the movement is known as clockwise movement and when a body rotates in the opposite direction to the hands of the clock, the movement is known as anticlockwise movement.

TYPES OF QUESTIONS

► Type I On the basis of Number.

In the boxes the number of elements can increase or decrease in a certain order.



Here, from Pf_1 to Pf_2 the number of elements is decreasing from 9 to 8.

From Pf_2 to Pf_3 the number of elements is decreasing from 8 to 7.

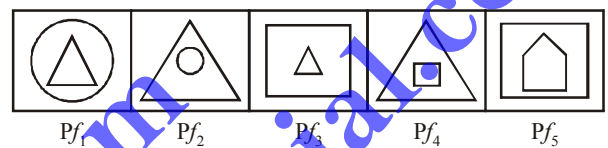
From Pf_3 to Pf_4 the number of elements is decreasing from 7 to 6.

From Pf_4 to Pf_5 the number of elements is decreasing from 6 to 5.

Hence, here number of elements is decreasing one-by-one.

Therefore next element $Pf_6 =$

► Type II On the basis of size and shape of elements in the series.



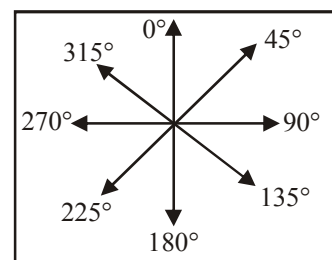
In this series from Pf_1 to Pf_2 , inside smaller element comes out and enlarges in size. Similarly, outside element goes inside and reduces in size. From Pf_3 to Pf_4 , inside smaller element comes out and enlarges in size. Similarly, outside element becomes the inside element and reduces in size. This chain will continue in Pf_5 to Pf_6 .

Hence, next figure will be (Pf_6) =

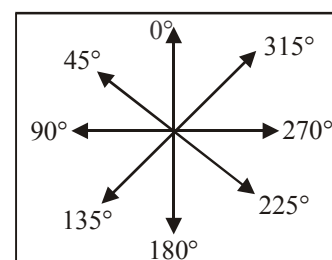


► Type III On the basis of Spinning of elements:

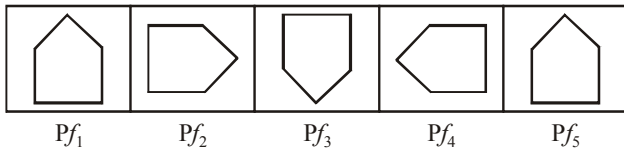
In Clockwise direction, spin on the basis of angle can be represented as follows:



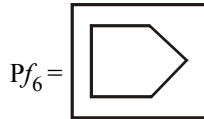
Anticlockwise Direction : In the anticlockwise direction, spin on the basis of angle can be represented as follows:



The orientation of the next element of the following series is increasing by 90° in clockwise direction.



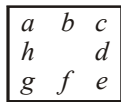
The elements of this series are rotating 90° clockwise. Hence



Here if Pf_1 is the same as Pf_5 and so Pf_2 is the same as Pf_6 .

► **Type IV On the basis of position:**

The position of elements is defined by the following type.



Let a to b be half home clockwise

$$= \frac{1}{2} \text{ position clockwise.}$$

Let a to c be one home clockwise.

$$= 1 \text{ position clockwise.}$$

Let a to d be one and half homes clockwise.

$$= 1\frac{1}{2} \text{ positions clockwise.}$$

Let a to e be two homes clockwise.

$$= 2 \text{ positions clockwise.}$$

Let a to f be two and half homes clockwise.

$$= 2\frac{1}{2} \text{ positions clockwise.}$$

and so on.

In anticlockwise direction the order of elements is of same type as described above.

For example:

Let a to h be half home anticlockwise

$$= \frac{1}{2} \text{ position anticlockwise.}$$

a to g is one home anticlockwise

$$= 1 \text{ position anticlockwise.}$$

a to f is one and half homes anticlockwise

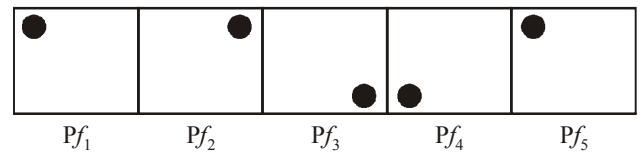
$$= 1\frac{1}{2} \text{ positions anticlockwise.}$$

a to e is two homes anticlockwise

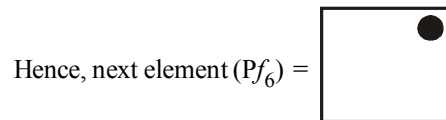
$$= 2 \text{ positions anticlockwise.}$$

and so on.

Now consider the following series:



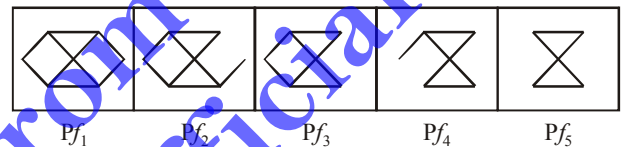
Here, the position of the given elements is increasing one by-one in clockwise direction.



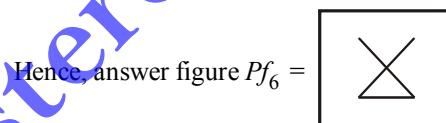
Hence, next element (Pf_6) =

► **Type V Questions based on Changing of Figure**

In this series, the parts of the element may increase or decrease.



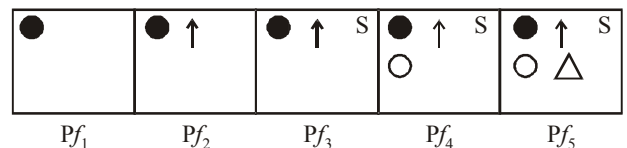
In the above series, one side on the right disappears, then left side disappears. Now upper side will disappear.



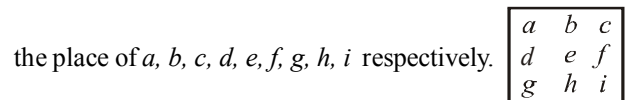
Hence, answer figure Pf_6 =

► **Type VI Increasing or Decreasing the Elements of Figure:**

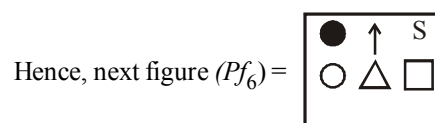
Sometimes inside elements of the figure may increase or decrease. This increase or decrease may be based on a certain rule. For example :



Here, at each subsequent step one element is increasing at



Hence, one new element will be introduced at the place of f in the next figure (Pf_6)

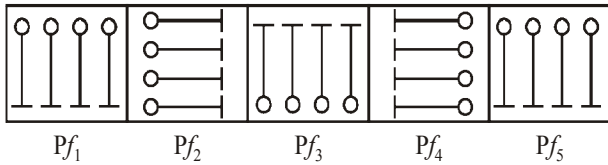


Hence, next figure (Pf_6) =

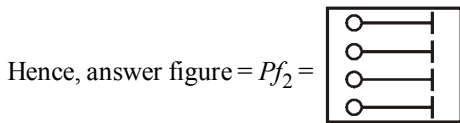
If problem figure first is identical to problem figure five of the series then answer problem figure will be identical to problem figure two.

i.e. if $Pf_1 = Pf_5$ then $Pf_2 =$ answer figure

ILLUSTRATION 1: Which is the answer figure of the following series?



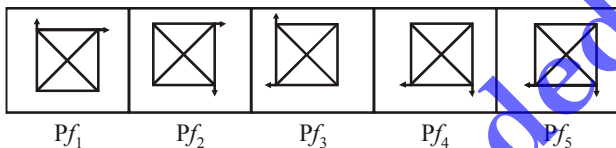
Sol. In this series Pf_1 and Pf_5 are identical.



If problem figure four is identical to problem figure five of the series then answer figure will be identical to problem figure three.

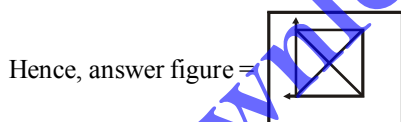
$Pf_4 = Pf_5 =$ then $Pf_3 =$ answer figure

ILLUSTRATION 2: Which is the answer figure of the following series?



Sol. In this series, $Pf_4 = Pf_5$

Hence, answer figure will be Pf_3

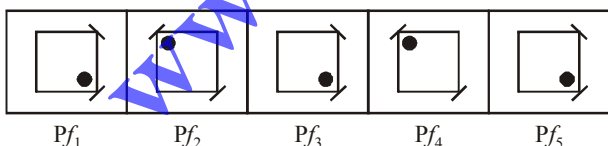


If figures first, third and fifth are identical then answer figures sixth will be identical to figures second and fourth.

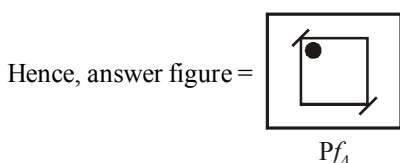
$Pf_1 = Pf_3 = Pf_5$

Hence, $Pf_2 = Pf_4 = Pf_6$

ILLUSTRATION 3: Which is the answer figure of the following series?



Sol. $Pf_1 = Pf_3 = Pf_5$. Hence, $Pf_2 = Pf_4 =$ answer figure.



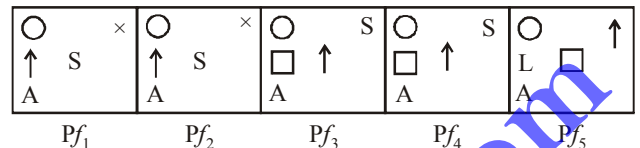
When first figure of the series is identical to second figure and third figure is identical to fourth figure, then answer figure will be identical to fifth figure.

$Pf_1 = Pf_2$

$Pf_3 = Pf_4$

$Pf_5 =$ answer figure.

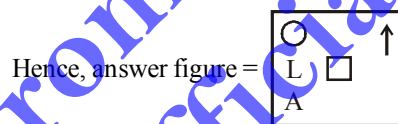
ILLUSTRATION 4: Which is the answer figure of the following series?



Sol. Here, $Pf_1 = Pf_2$

$Pf_3 = Pf_4$

Hence, $Pf_5 =$ answer figure



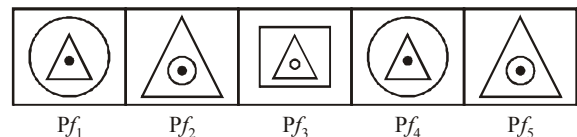
When first figure of the series is identical to fourth figure and second figure is identical to fifth figure then answer figure will be identical to third figure (Pf_3)

$Pf_1 = Pf_4$

$Pf_2 = Pf_5$

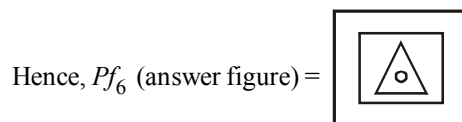
Hence, $Pf_3 = Pf_6$

ILLUSTRATION 5: Which is the answer figure of the following series?



Sol. Here, $Pf_1 = Pf_4$ and $Pf_2 = Pf_5$

Hence, $Pf_3 = Pf_6$ (answer figure)



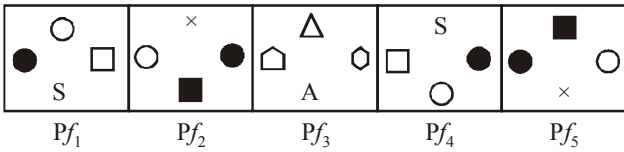
If problem figure fourth of the series is reverse of problem figure first and problem figure fifth is reverse of problem figure second then answer figure will be reverse of problem figure third.

$Pf_4 \rightarrow Pf_1$ (reverse)

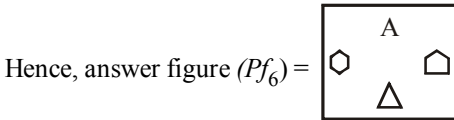
$Pf_5 \rightarrow Pf_2$ (reverse)

Hence, $Pf_6 \rightarrow Pf_3$ (reverse)

ILLUSTRATION 6: Which is the answer figure of the following series?



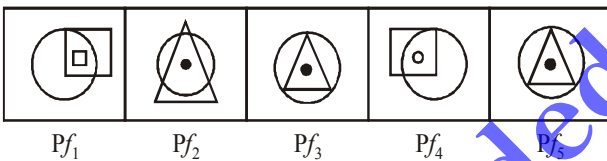
Sol. Here, $Pf_4 \rightarrow$ reverse of Pf_1
 $Pf_5 \rightarrow$ reverse of Pf_2
 $Pf_3 \rightarrow$ reverse figure



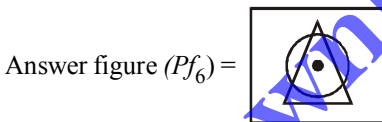
❖ If third figure of the series is identical to fifth figure, then answer figure Pf_6 will be identical to second figure.

$Pf_3 = Pf_5$ then $Pf_2 =$ answer

ILLUSTRATION 7: Which is the answer figure of the following series?



Sol. Here, $Pf_3 = Pf_5$
 Hence, $Pf_2 =$ answer figure (Pf_6)

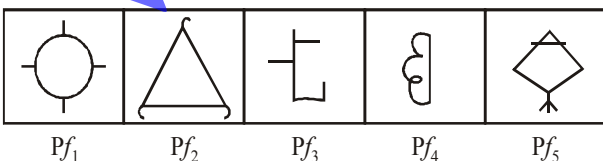


❖ If all figures $Pf_1, Pf_2, Pf_3, Pf_4,$ and Pf_5 are different and there is no certain pattern, then answer figure will be different from all of these.

$Pf_1 \neq Pf_2 \neq Pf_3 \neq Pf_4 \neq Pf_5$

then answer figure will not be equal to any of them.

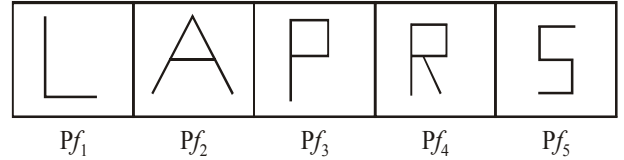
ILLUSTRATION 8: Which is the answer figure of the following series?



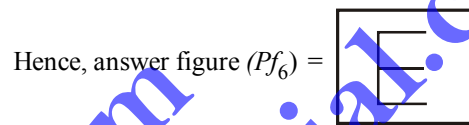
Sol. Here all the five figures are different.
 Hence, answer figure will be different from the given figures.

❖ If the letters of the English alphabet are considered as figures, then it will be based on the number of lines in the alphabet.

ILLUSTRATION 9: Which is the answer figure of the following series?



Sol. Here numbers of line are respectively 2, 3, 4, 5 and 5.
 Hence, the answer figure will contain 4 lines.
 If $Pf_4 = Pf_5$, then $Pf_3 = Pf_6$

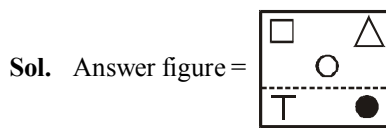
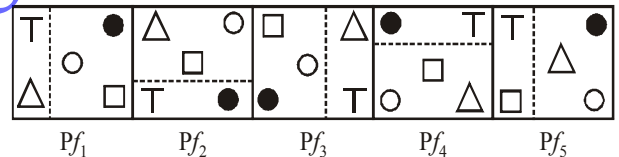


❖ If in each box of the problem figure, the number of figures is 5, then the figures can be divided into two groups:

1. group of two figures
2. group of three figures.

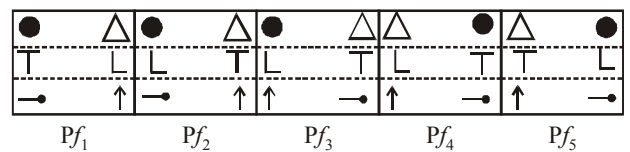
Both groups of figures would be based on either clockwise change or anticlockwise change.

ILLUSTRATION 10: Which is the answer figure of the following series?



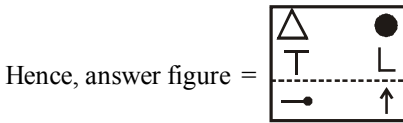
❖ If in each box of the problem figure, the number of figures is 6, then according to deviation of their path and changing of figures, we select the answer figure.

ILLUSTRATION 11: Which is the answer figure of the following series?



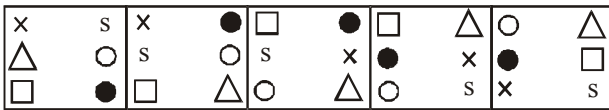
Sol. From Pf_1 to Pf_2 , both Middle elements change their places.
 From Pf_2 to Pf_3 both Lower elements change their places.
 From Pf_3 to Pf_4 , both Upper elements change their places.

Similarly Pf_4 to Pf_5 , both Middle elements change their places. Hence, in answer figure, Lower elements will change their places.

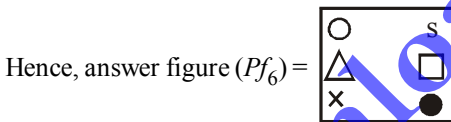
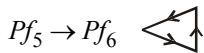
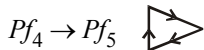
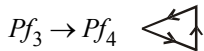
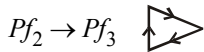
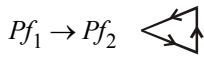


❖ If each box of the question figure has six elements, then these figures will change in a triangular path.

ILLUSTRATION 12 : Which is the answer figure of the following series?

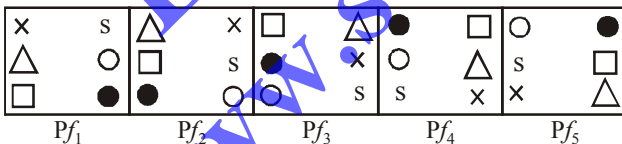


Sol. Here, changing order of elements is as follows:

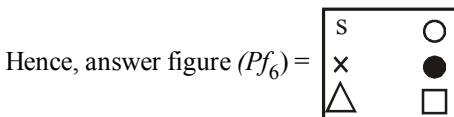
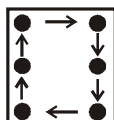


❖ Movements on rectangular or square path in clockwise/ anticlockwise direction.

ILLUSTRATION 13 : Which is the answer figure of the following series?

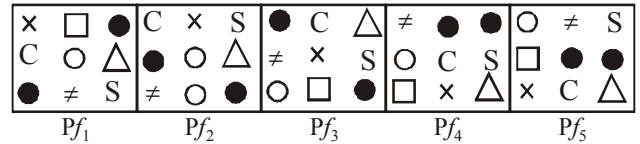


Sol. Here, elements are moving on a square path.

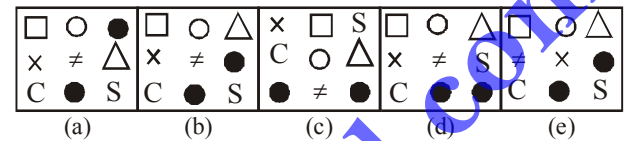


❖ If each box of the question figure has more than six elements, then the answer figure can be obtained through the movement of one or two element(s).

ILLUSTRATION 14 : Which is the answer figure of the following series?



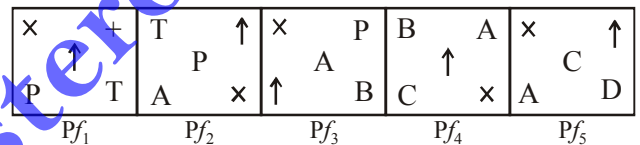
Answer figures given:



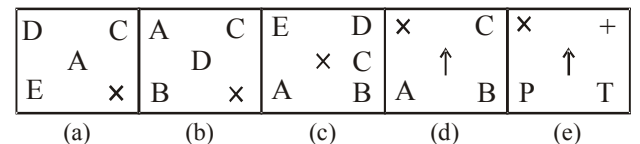
Sol. (b) Here, we have taken the movements of \times and \bullet . Hence we conclude that the answer figure will (b).

❖ Sometimes, each question figure changes its elements, and simultaneously a new element appears.

ILLUSTRATION 15 : Which is the answer figure of the following series?

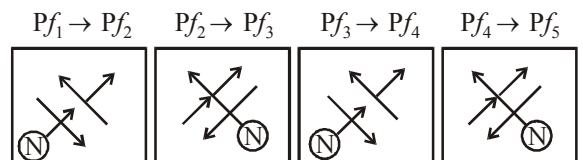


Answer figures given

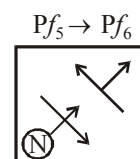


Sol. (a) Each element of question figure change its position. Simultaneously a new element appears at the place of

(N) shown in the figures below :

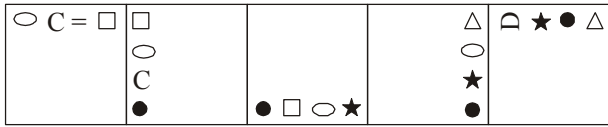


Hence, next change will be as follows:

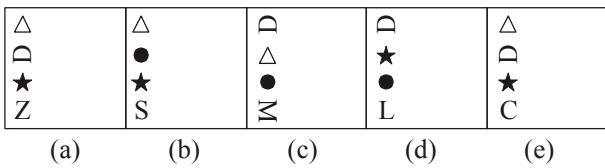


SOLVED EXAMPLES

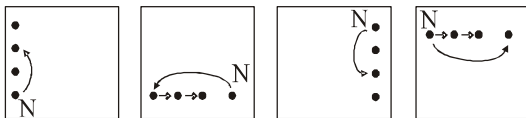
EXAMPLE 1: Which one of the five answer figures should come after the problem figures, if the sequence was continued?



Answer Figures

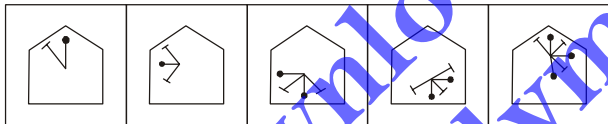


Sol. (a) In each subsequent figure following changes occur and a new figure appears at the place of N:

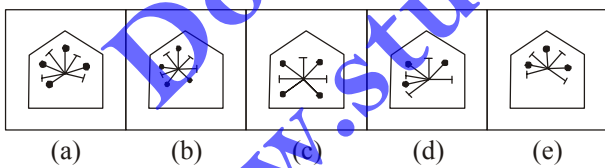


from Pf_1 to Pf_2 Pf_2 to Pf_3 Pf_3 to Pf_4 Pf_4 to Pf_5

EXAMPLE 2: Which one of the five answer figures should come after the problem figures, if the sequence was continued?

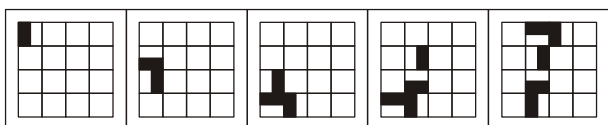


Answer Figure

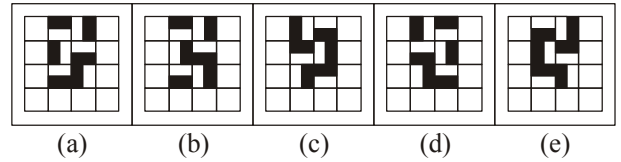


Sol. (e) In each subsequent figure, inside design of pentagon 'T' and '•' are added at the end anticlockwise. Each time this group rotates 90°.

EXAMPLE 3: Which one of the five answer figures should come after the problem figures, if the sequence was continued?



Answer Figure

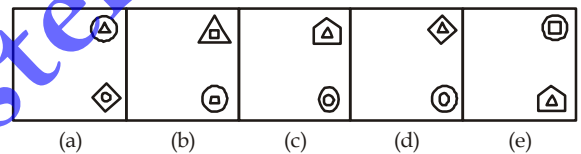


Sol. (b) In each subsequent figure, half a square block gets shaded from upper left to lower left and then moves up again in the second column. In each subsequent figure one shaded figure, gets added.

EXAMPLE 4: The second figure in the first unit of the problem figures bears a certain relationship to the first figure. Similarly one of the figures in the answer figures bears the same relationship to the first figure in the second unit of the problem figures. You are to locate the figure which would fit in the question mark.



Answer Figure



Sol. (d) From figure II to I the upper element moves to lower position and gets enlarged while the lower element moves to upper position and is encircled by a structure having one more side.

EXAMPLE 5: The second figure in the first unit of the problem figures bears a certain relationship to the first figure. Similarly one of the figures in the answer figures bears the same relationship to the first figure in the second unit of the problem figures. You are to locate the figure which would fit in the question mark.

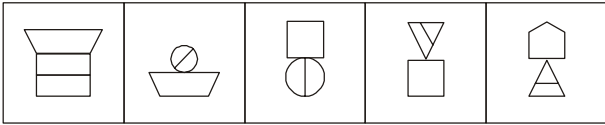


Sol. (c) From figure II to I, one figure rotates by 90° in ACW direction while the other figure rotates by 90° in CW direction and gets inverted.

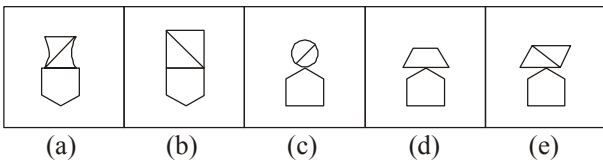
EXERCISE

DIRECTIONS : In each of the questions given below, which one of the five answer figures should come after the problem figures, if the sequence were continued ?

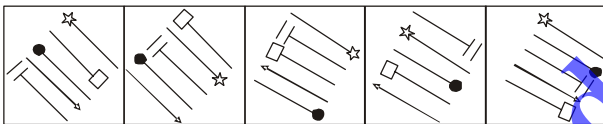
1. Problem Figures



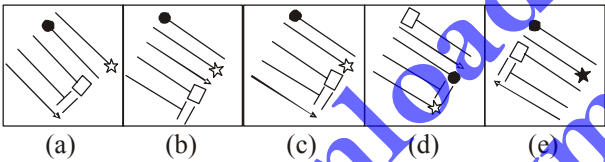
Answer Figures



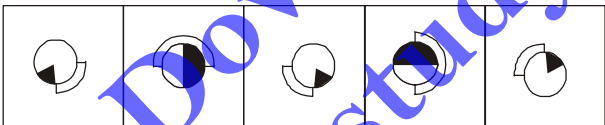
2. Problem Figures



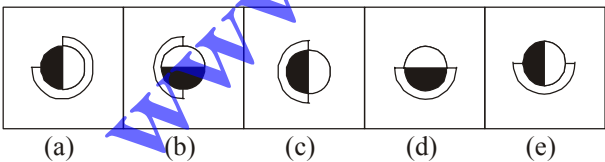
Answer Figures



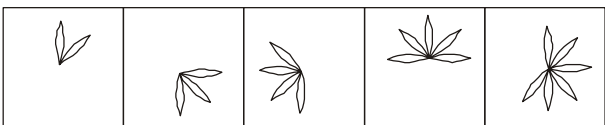
3. Problem Figures



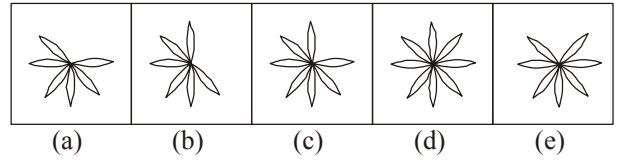
Answer Figures



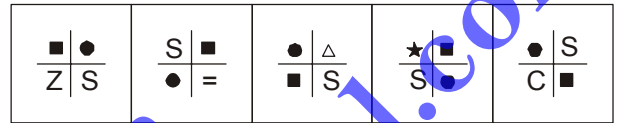
4. Problem Figures



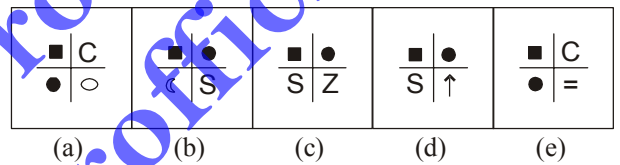
Answer Figures



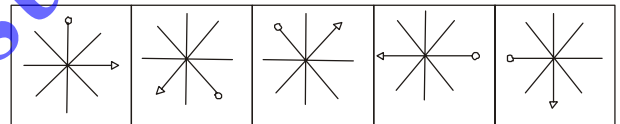
5. Problem Figures



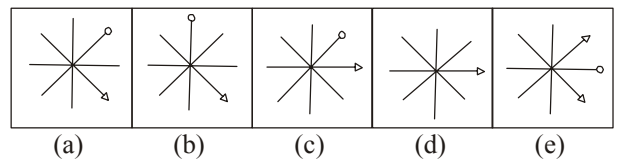
Answer Figures



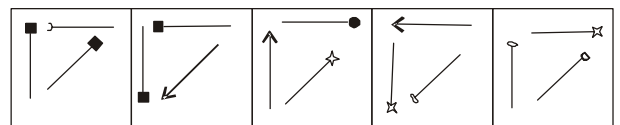
6. Problem Figures



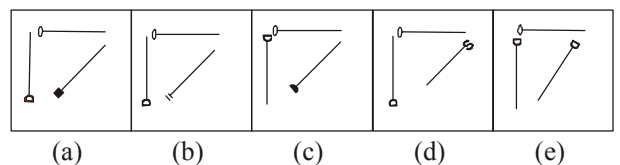
Answer Figures



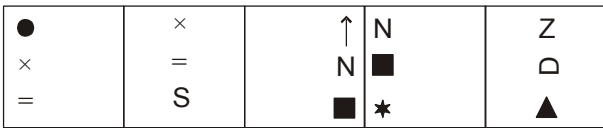
7. Problem Figures



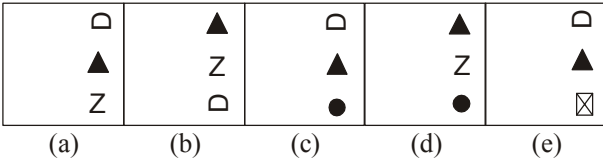
Answer Figures



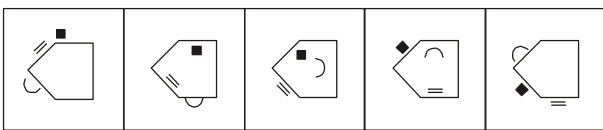
8. Problem Figures



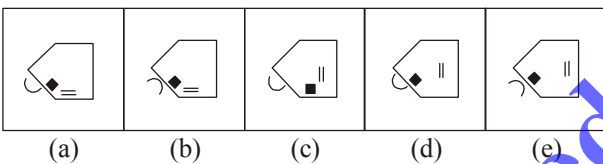
Answer Figures



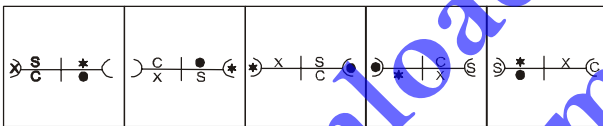
9. Problem Figures



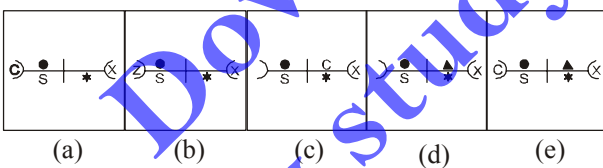
Answer Figures



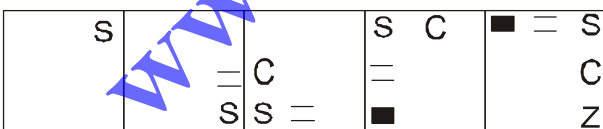
10. Problem Figures



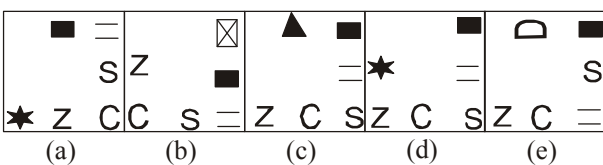
Answer Figures



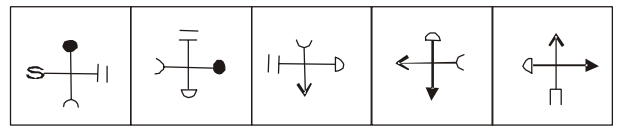
11. Problem Figures



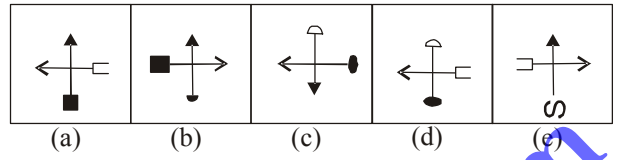
Answer Figures



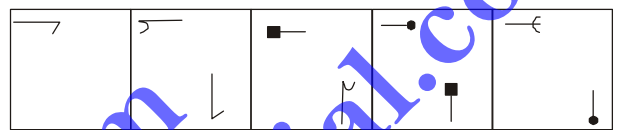
12. Problem Figures



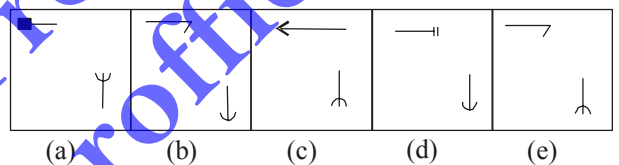
Answer Figures



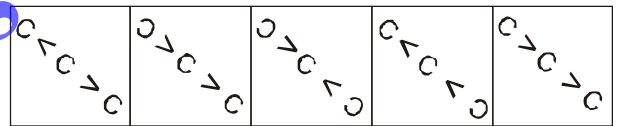
13. Problem Figures



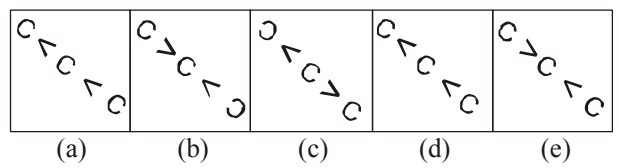
Answer Figures



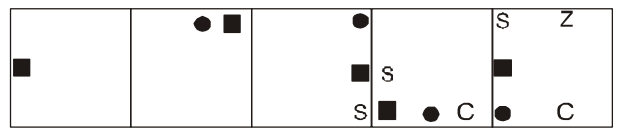
14. Problem Figures



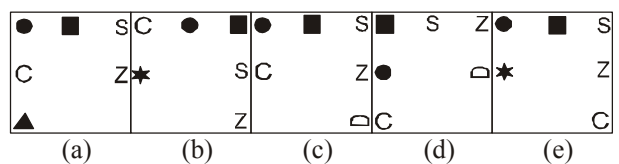
Answer Figures



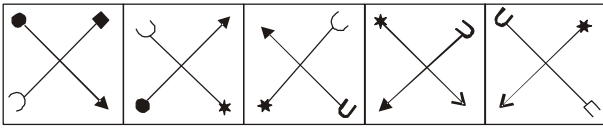
15. Problem Figures



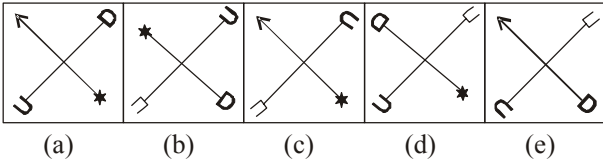
Answer Figures



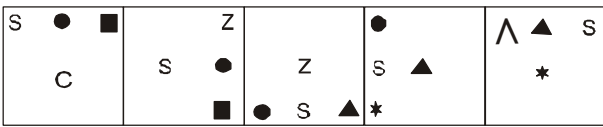
16. Problem Figures



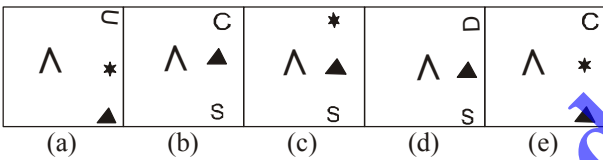
Answer Figures



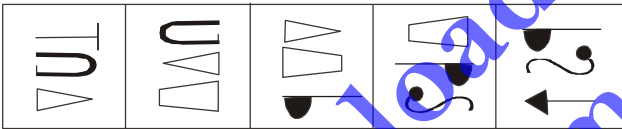
17. Problem Figures



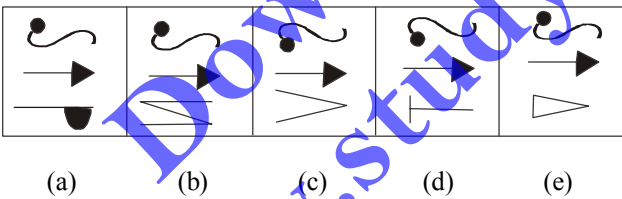
Answer Figures



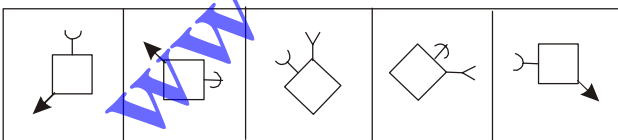
18. Problem Figures



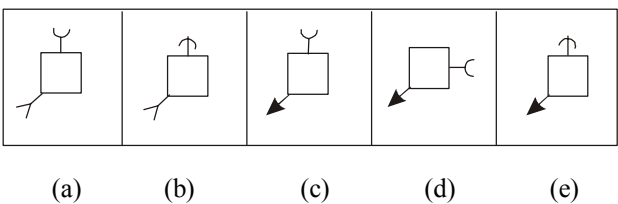
Answer Figures



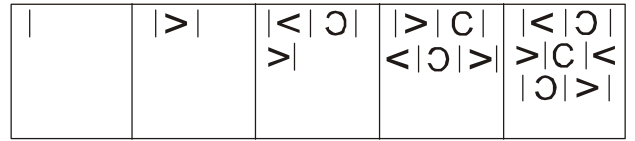
19. Problem Figures



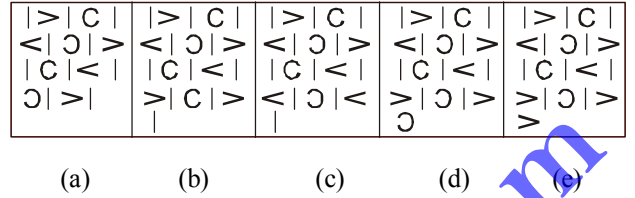
Answer Figures



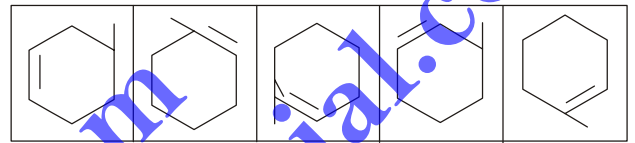
20. Problem Figures



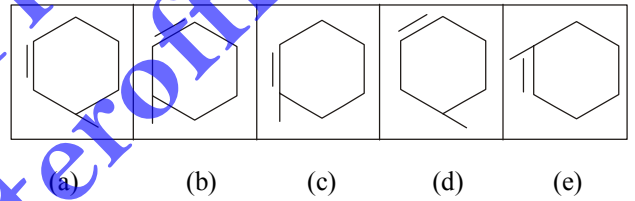
Answer Figures



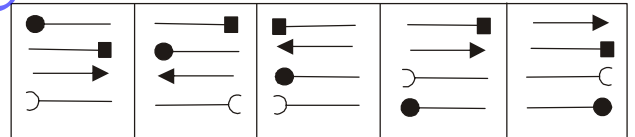
21. Problem Figures



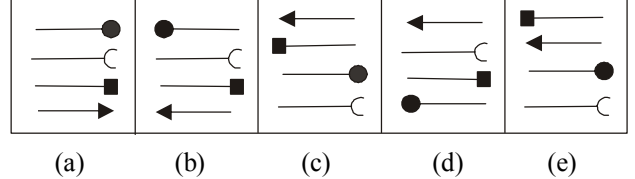
Answer Figures



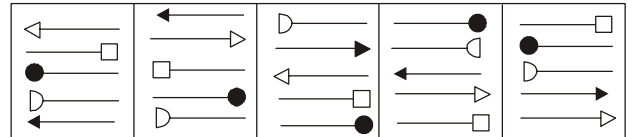
22. Problem Figures



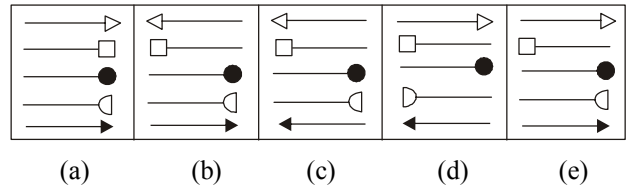
Answer Figures



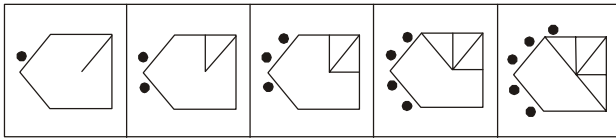
23. Problem Figures



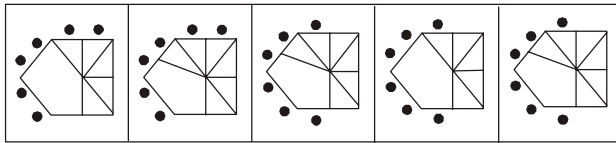
Answer Figures



24. Problem Figures



Answer Figures

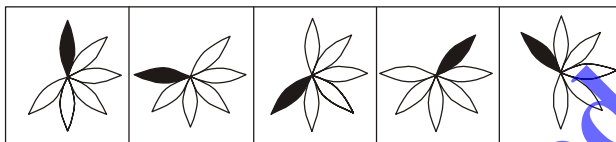


(a) (b) (c) (d) (e)

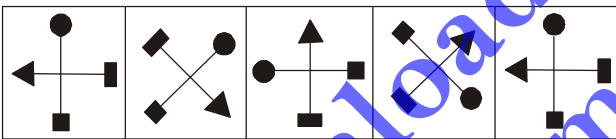
25. Problem Figures



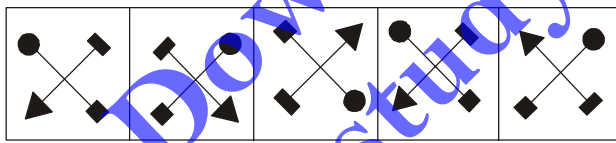
Answer Figures



26. Problem Figures

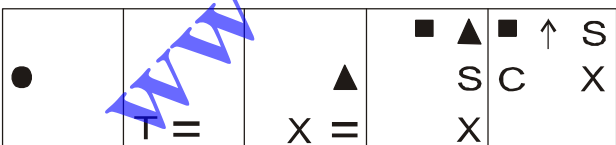


Answer Figures

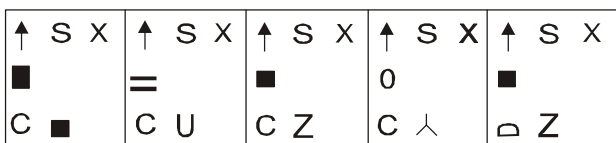


(a) (b) (c) (d) (e)

27. Problem Figures

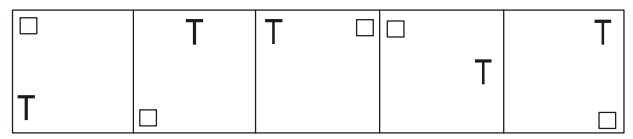


Answer Figures

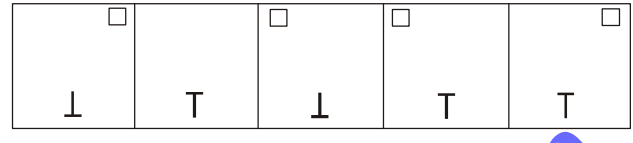


(a) (b) (c) (d) (e)

28. Problem Figures

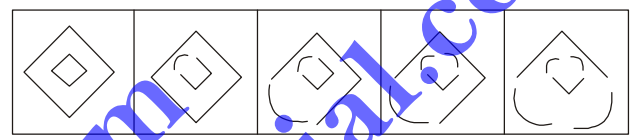


Answer Figures

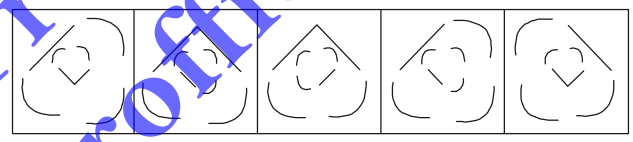


(a) (b) (c) (d) (e)

29. Problem Figures

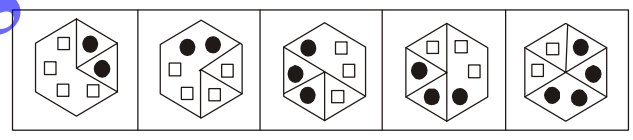


Answer Figures

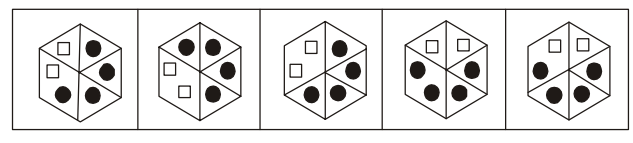


(a) (b) (c) (d) (e)

30. Problem Figures

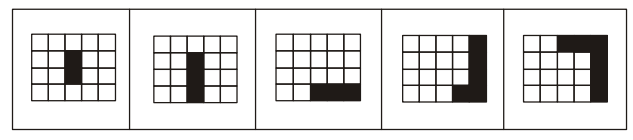


Answer Figures

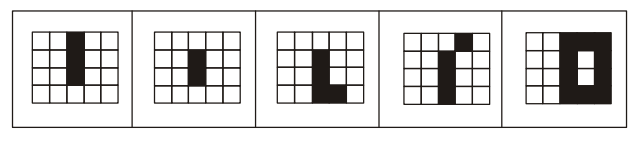


(a) (b) (c) (d) (e)

31. Problem Figures

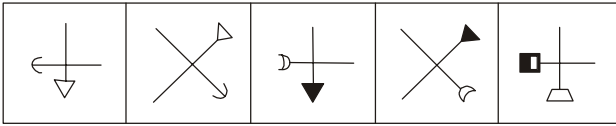


Answer Figures

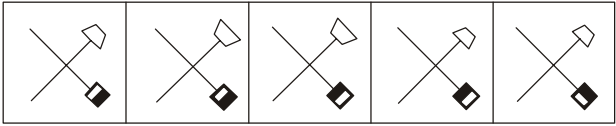


(a) (b) (c) (d) (e)

32. Problem Figures

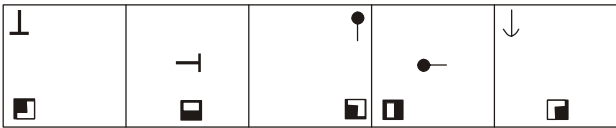


Answer Figures

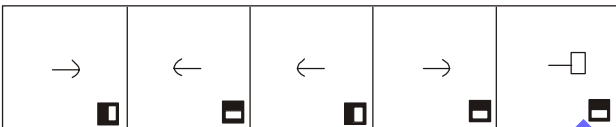


- (a)
- (b)
- (c)
- (d)
- (e)

33. Problem Figures



Answer Figures

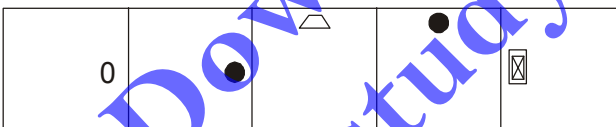


- (a)
- (b)
- (c)
- (d)
- (e)

34. Problem Figures

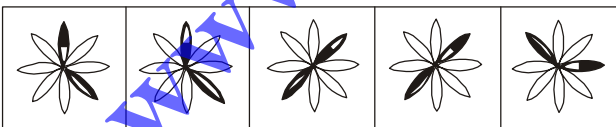


Answer Figures

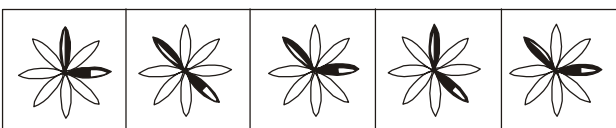


- (a)
- (b)
- (c)
- (d)
- (e)

35. Problem Figures

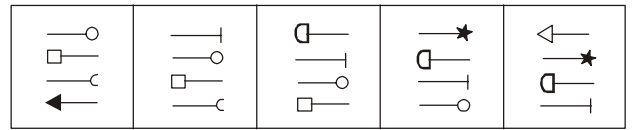


Answer Figures

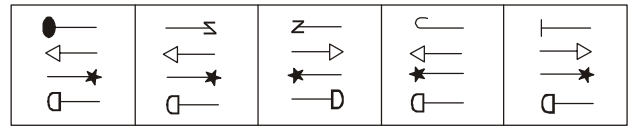


- (a)
- (b)
- (c)
- (d)
- (e)

36. Problem Figures

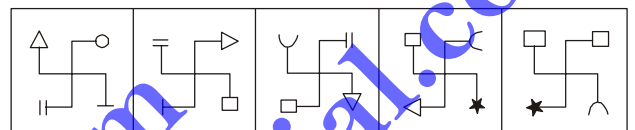


Answer Figures

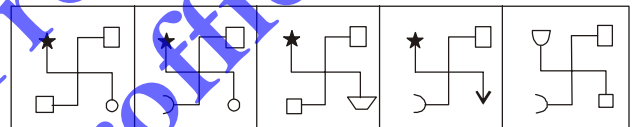


- (a)
- (b)
- (c)
- (d)
- (e)

37. Problem Figures

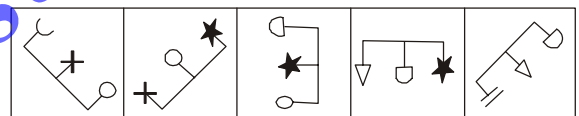


Answer Figures

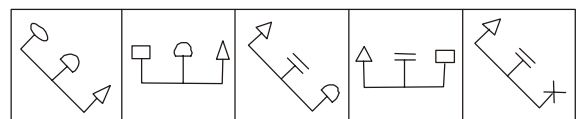


- (a)
- (b)
- (c)
- (d)
- (e)

38. Problem Figures

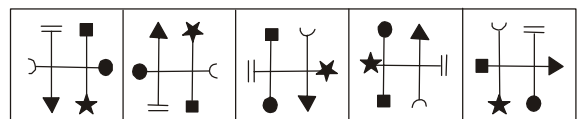


Answer Figures

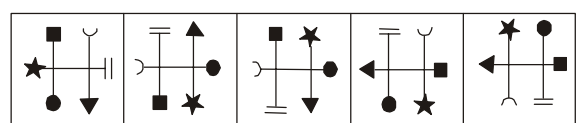


- (a)
- (b)
- (c)
- (d)
- (e)

39. Problem Figures

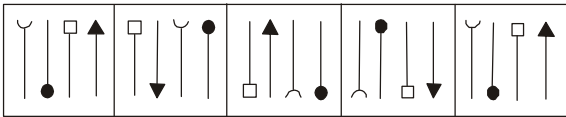


Answer Figures

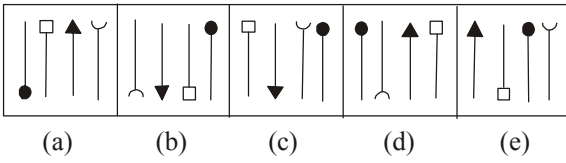


- (a)
- (b)
- (c)
- (d)
- (e)

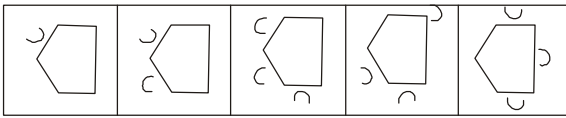
40. Problem Figures



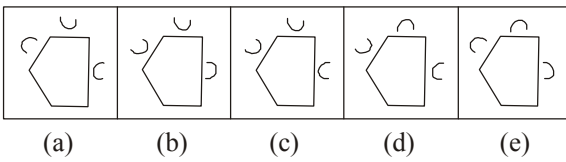
Answer Figures



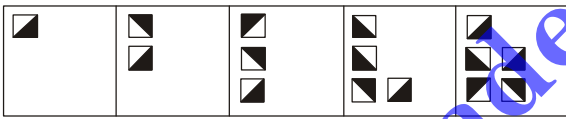
41. Problem Figures



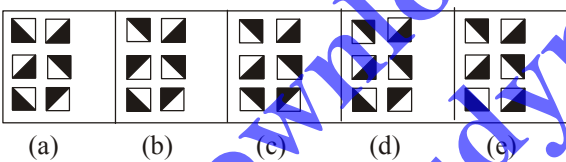
Answer Figures



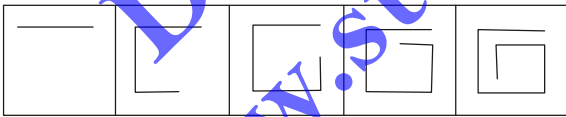
42. Problem Figures



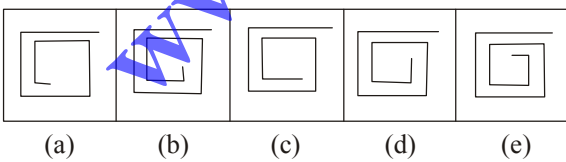
Answer Figures



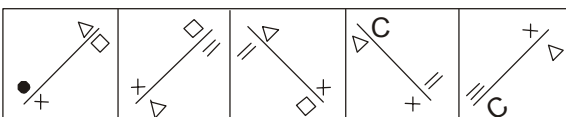
43. Problem Figures



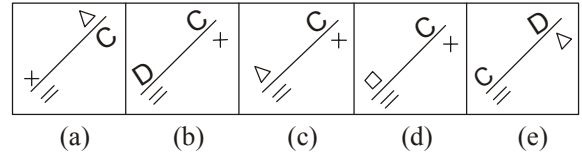
Answer Figures



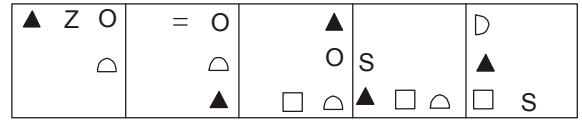
44. Problem Figures



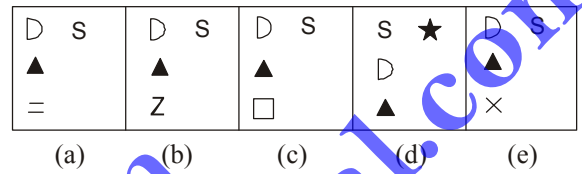
Answer Figures



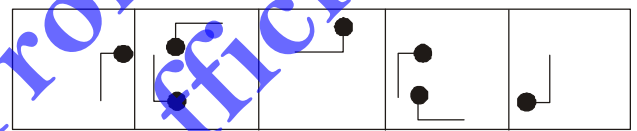
45. Problem Figures



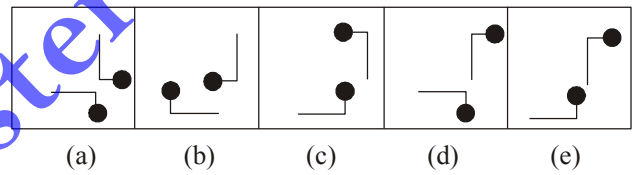
Answer Figures



46. Problem Figures



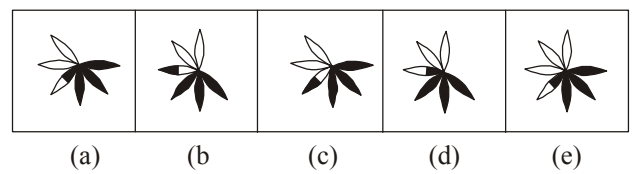
Answer Figures



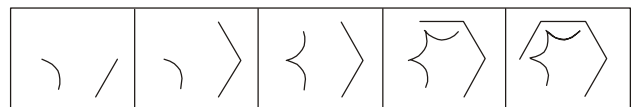
47. Problem Figures



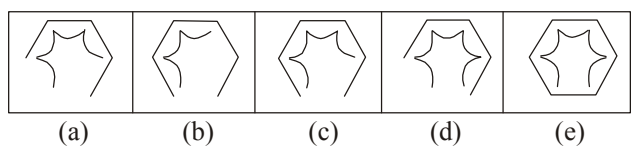
Answer Figures



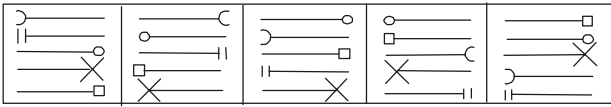
48. Problem Figures



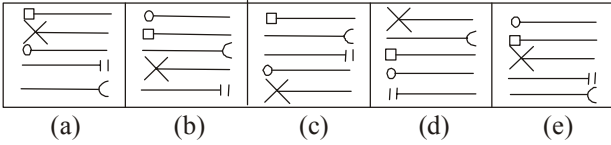
Answer Figures



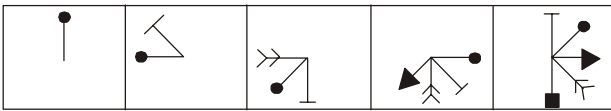
49. Problem Figures



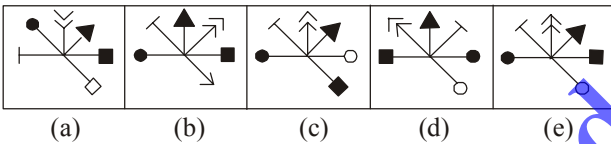
Answer Figures



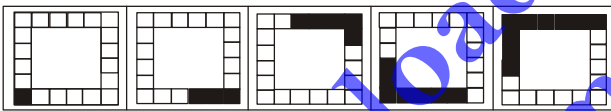
50. Problem Figures



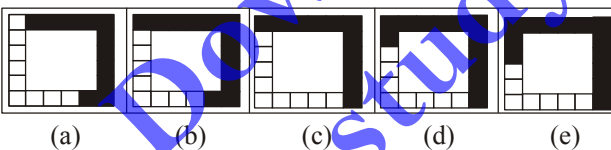
Answer Figures



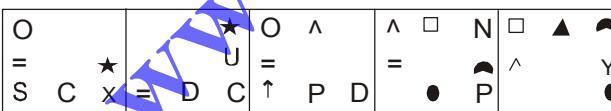
51. Problem Figures



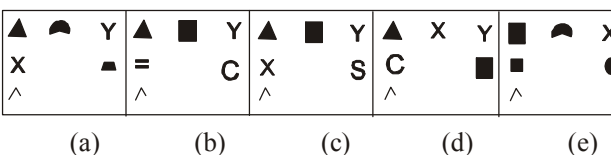
Answer Figures



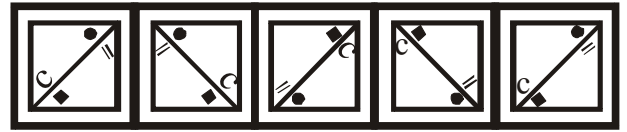
52. Problem Figures



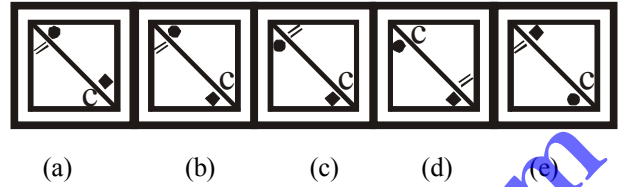
Answer Figures



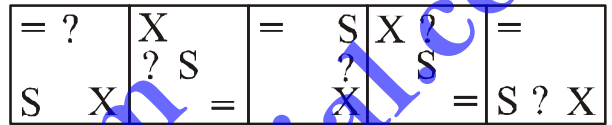
53. Problem Figures



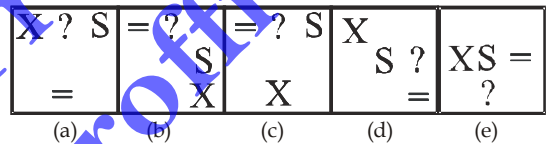
Answer Figures



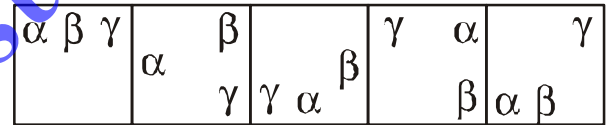
54. Problem Figures



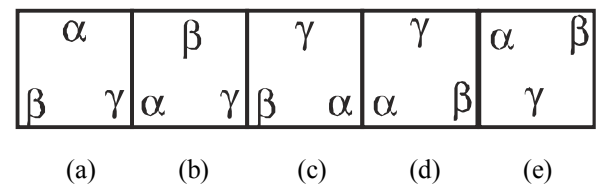
Answer Figures



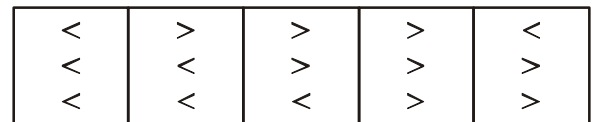
55. Problem Figures



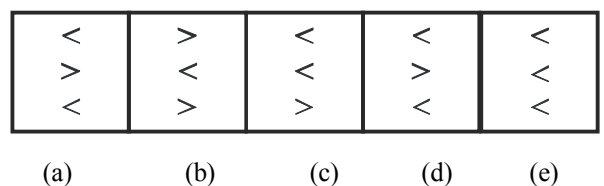
Answer Figures



56. Problem Figures



Answer Figures

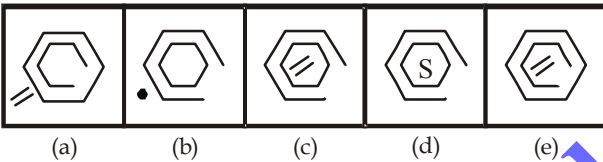


DIRECTIONS (57-61) : In each of these questions there are two sets of figures. The figures on the top are Problem Figures (four figures and one question-marked space) and those on the bottom are Answer Figures indicated by letters a, b, c, d and e. A series is established if one of the five Answer Figures is placed at the "question-marked space". Question Figures form a series if they change from left to right according to some rule. The number of the Answer Figure which should be placed in the question-marked space is the answer. All the five figures i.e. four Problem Figures and one Answer Figure placed in the question-marked space should be considered as forming the series.

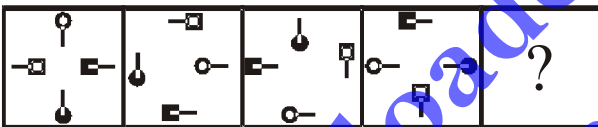
57. Problem Figures



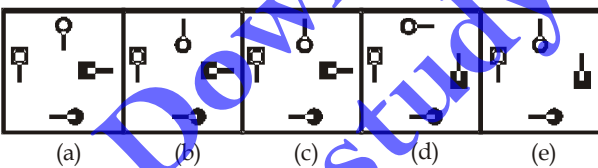
Answer Figures



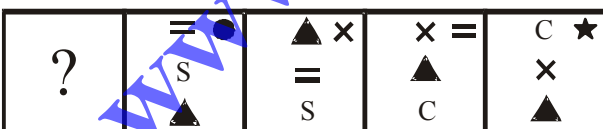
58. Problem Figures



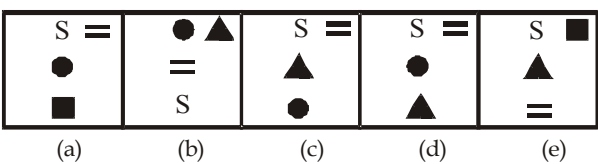
Answer Figures



59. Problem Figures



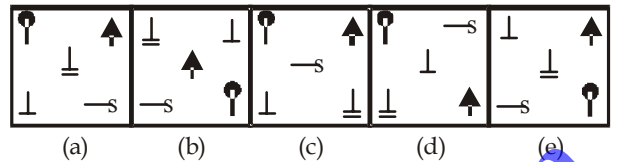
Answer Figures



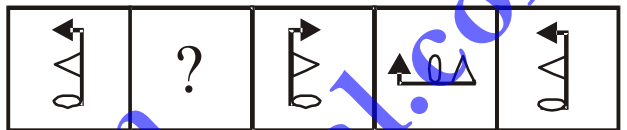
60. Problem Figures



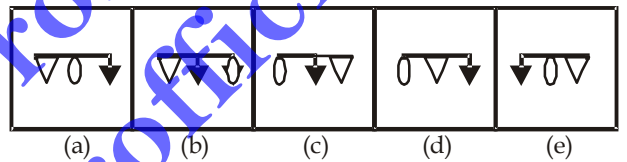
Answer Figures



61. Problem Figures



Answer Figures

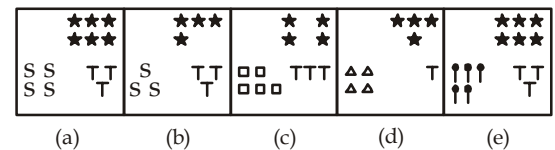


DIRECTIONS (62-76) : The second figure in the first unit of the problem figures bears a certain relationship to the first figure. Similarly one of the figures in the answer figures bears the same relationship to the other figure. You are to locate the figure which would fit in the question mark.

62. Problem Figures



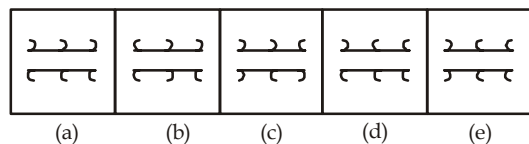
Answer Figures



63. Problem Figures



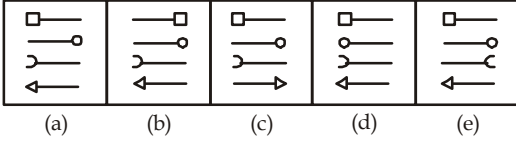
Answer Figures



64. Problem Figures



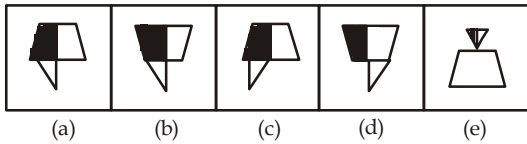
Answer Figures



65. Problem Figures



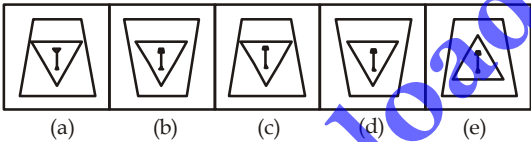
Answer Figures



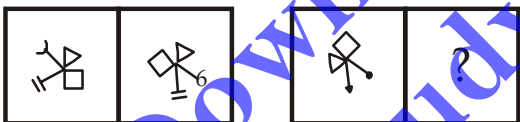
66. Problem Figures



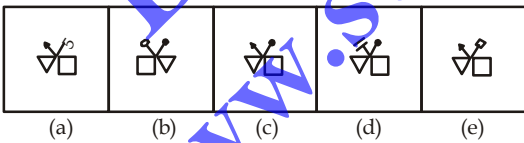
Answer Figures



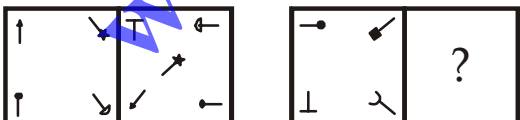
67. Problem Figures



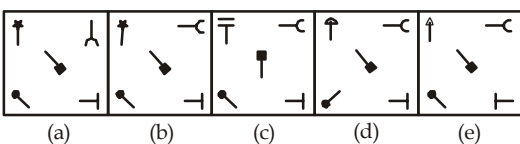
Answer Figures



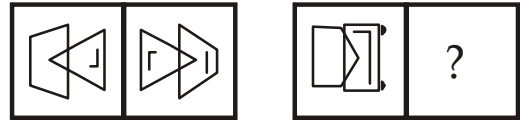
68. Problem Figures



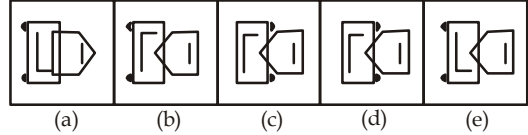
Answer Figures



69. Problem Figures



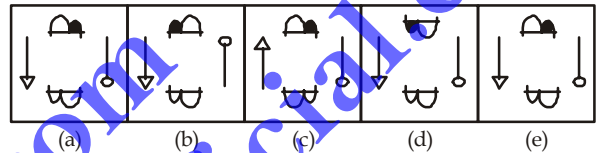
Answer Figures



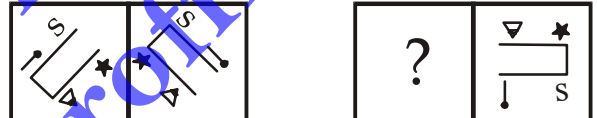
70. Problem Figures



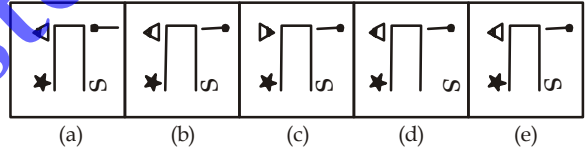
Answer Figures



71. Problem Figures



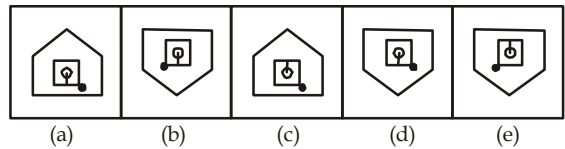
Answer Figures



72. Problem Figures



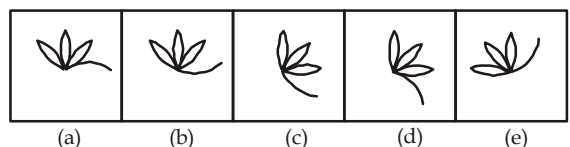
Answer Figures



73. Problem Figures



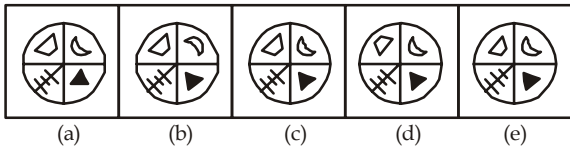
Answer Figures



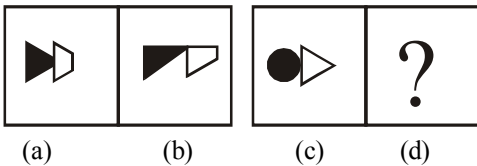
74. Problem Figures



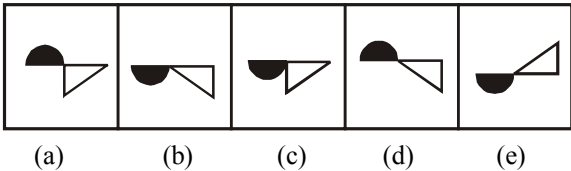
Answer Figures



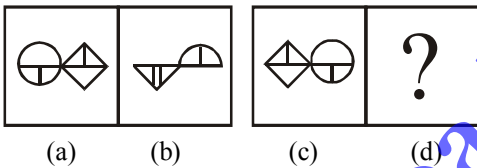
75. Problem Figures



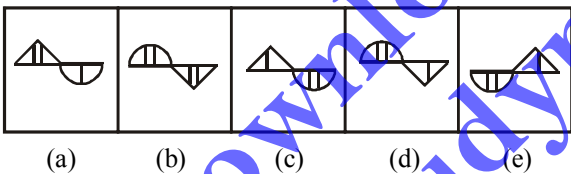
Answer Figures



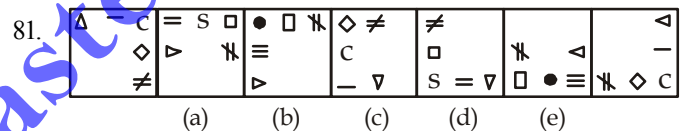
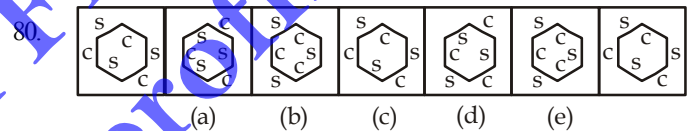
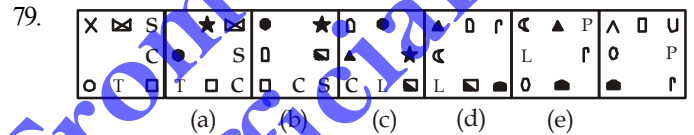
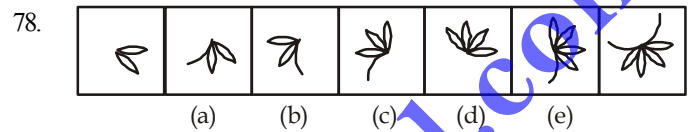
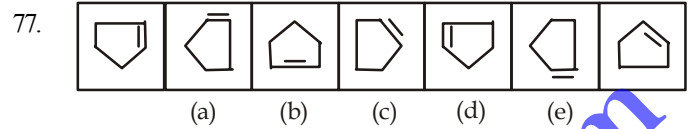
76. Question Figures



Answer Figure



DIRECTIONS (77-81) : In each of the following questions the series begins with an unnumbered figure on the extreme left. One and only one of the five numbered figures in the series does **not** fit into the series. The two unnumbered figures, one each on the extreme left and the extreme right fit into the series. You have to take as many aspects into account as possible of the figures in the series and find out one of the five numbered figures which does **not** fit into the series. The number of that figure is the answer.



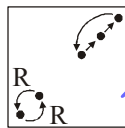
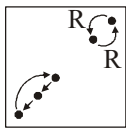
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ANSWER KEY

1	(c)	11	(c)	21	(c)	31	(e)	41	(a)	51	(c)	61	(e)	71	(b)
2	(c)	12	(e)	22	(d)	32	(a)	42	(d)	52	(d)	62	(b)	72	(d)
3	(e)	13	(c)	23	(e)	33	(d)	43	(b)	53	(b)	63	(c)	73	(b)
4	(c)	14	(c)	24	(d)	34	(a)	44	(b)	54	(d)	64	(a)	74	(c)
5	(d)	15	(b)	25	(a)	35	(c)	45	(e)	55	(a)	65	(a)	75	(c)
6	(a)	16	(e)	26	(b)	36	(b)	46	(c)	56	(c)	66	(c)	76	(d)
7	(b)	17	(d)	27	(b)	37	(e)	47	(a)	57	(d)	67	(a)	77	(a)
8	(e)	18	(b)	28	(e)	38	(c)	48	(a)	58	(d)	68	(d)	78	(b)
9	(d)	19	(e)	29	(b)	39	(e)	49	(a)	59	(e)	69	(e)	79	(c)
10	(a)	20	(a)	30	(b)	40	(c)	50	(e)	60	(e)	70	(a)	80	(d)
														81	(d)

ANSWERS & EXPLANATIONS

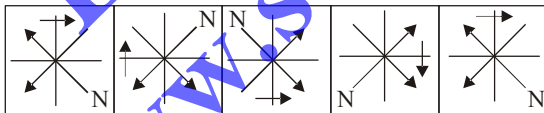
- (c) In each subsequent figure upper design comes down and upper changes to a new design. Line in each figure rotates 45° anticlockwise.
- (c) In each subsequent figure the design changes as follows. Here R indicates rotation of element.



from (1) to(2)
from (3) to (4)
from (5) to(6)

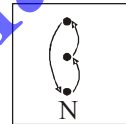
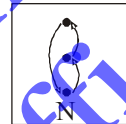
(2) to (3)
(4) to (5)

- (e) In each subsequent figure black shaded portion first takes less than one quarter then half and moves in anticlockwise direction.
- (c) In each subsequent figure the group of leaves rotates 90° clockwise and one new leaf appears.
- (d) In each subsequent figure, the designs changes as follows (Here N indicates new design):



form (1) to (2) (2) to (3) (3) to (4) (4) to (5) (5) to (6)

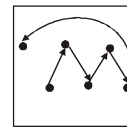
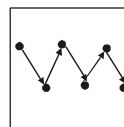
- (a) In each subsequent figure, 'Δ' in main design rotates, 135°, 180°, 225°, 270° and 315° clockwise. Circle 'O' rotates 135° and 180° in this direction in alternate figures.
- (b) In each subsequent figure, the middle design reversed and change in to new design, then it rotates 135° clockwise and moves to the left side, then rotates 90° anticlockwise. Similarly other figures also change accordingly.
- (e) In each question figure, from (1) to (2) and (3) to (4) designs change as follows:



from (1) to (2) (3) to (4)

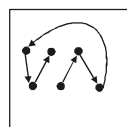
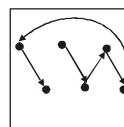
- (d) The design 'C' moves one step along the side of pentagon in anti-clockwise direction and after every two figures it moves inside or outside the pentagon. The equal sign '=' also moves along the side of pentagon in anti-clockwise direction alternately. In the first step it moves inside the pentagon and in the third step it moves outside. The shaded square moves inside the pentagon in the first step, then it moves one step in anti-clockwise direction and in the third step it moves out of the pentagon.

- (a) The design on the upper right moves to the right most position in the first step and in the second step it moves to the left most position. Therefore, the answer figures (b), (c) and (d) can be ruled out. In each subsequent figure the lower right design moves upward. The movement of designs are as follows:



from (1) to (2)

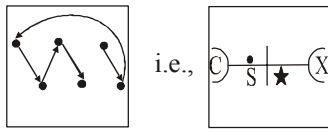
(2) to (3)



from (3) to (4)

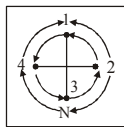
(4) to (5)

Hence, from question figure (5) to (6), the designs would be changed as follows:



Therefore we obtain answer figure (a).

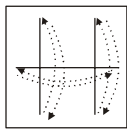
- 11. (c) In each subsequent figure the design moves one step in clockwise direction and one new design is introduced in front of the pre-existing designs and behind the pre-existing designs alternately.
- 12. (e) From Problem figure (1) to (2) the top and the right designs interchange positions. Similarly, the left and the lower designs interchange positions and a new design replaces the lower design. Similar changes occur from problem figure (3) to (4) and from problem figure (5) to answer figure.



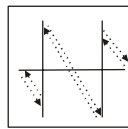
- 13. (c) From problem figure (1) to (2) both the designs interchange positions and the design at the upper left corner is replaced with a new design. The upper left design moves diagonally downward after being rotated through 90° clockwise and being inverted laterally. Similar changes occur in the subsequent figures.
- 14. (c) From problem figure (1) to (2) the first and the second designs from the top are inverted. From problem figure (2) to (3) the fourth and the fifth designs are inverted. Therefore, from problem figure (5) to answer figure the first and the second designs would be inverted.
- 15. (b) In the subsequent figures the pre-existing designs move one and a half steps and half step clockwise alternately and a new design is introduced behind and in front of the pre-existing designs alternately.
- 16. (e) From problem figure (1) to (2) the two right designs interchange positions and a new design is introduced at the lower right position. Similarly, the two left designs interchange positions. Similar changes occur from problem figure (3) to (4) and from problem figure (5) to answer figure.
- 17. (d) From problem figure (1) to (2) the plane of designs rotates 90° clockwise, two designs interchange positions and the design earlier in the centre is replaced with a new design. Similar changes occur from problem figure (3) to (4) and from problem figure (5) to answer figure.
- 18. (b) In each subsequent figure the designs move upward and get inverted and a new design appears at the bottom most position.
- 19. (e) From problem figure (1) to (5) the two designs move one step in clockwise direction and the curve is inverted. Similar changes occur from problem figure (3) to (4) and from problem figure (5) to answer figure.

- 20. (a) In each subsequent problem figure from second figure onwards, new designs are made in the sequence '| > | > |'. Simultaneously, '>' and '| >' of earlier designs get inverted at their place.
- 21. (d) In each subsequent figure the outer line segment moves respectively one, two, three, four sides, in anticlockwise direction. The other line segment moves two or three steps in clockwise directions alternately and moves out of the hexagon alternately.
- 22. (d) In each subsequent figure two adjacent designs interchange positions while the other two designs are inverted.
- 23. (e) In each subsequent figure, the first design moves down & gets inverted, the second & third do the same. The fourth design moves down & the fifth design moves to the top, both without inversion.
- 24. (d) In each subsequent figure the one dot and one line segment are added.
- 25. (a) In each subsequent figure the leafs rotate through 45°, 90°, 135°, 180°, 225° respectively in anticlockwise direction and alternately the first and the last leafs get shaded.
- 26. (b) This problem is based on the rule (1) = (5) and hence (2) = (6).
- 27. (b) In each subsequent figure the design moves half step in anticlockwise direction, one new design appears ahead of the pre-existing designs and one design is replaced with a new design.
- 28. (e) In the subsequent figures the square moves respectively one step and two steps in anticlockwise direction alternately while the T shaped design moves one and a half steps in clockwise direction and half step in anti-clockwise direction alternately.
- 29. (b) In each subsequent figure one side of quadrilateral becomes a curve in a set order.
- 30. (b) In each subsequent figure the smaller designs move one step in anticlockwise direction and the line segments rotate through 45° clockwise. Again, one square is replaced with a dot and one line segment with a dot and one line segment is added after every two figures.
- 31. (e) In each subsequent figure from upper to lower and left to right, one, two and three blocks get shaded one by one.
- 32. (a) From problem figure (1) to (2) the design rotates through 135° anticlockwise and the triangle gets inverted. Similar changes occur from problem figure (3) to (4) and from problem figure (5) to answer figure.
- 33. (d) The square moves stepwise from left to right and then moves to left from right in one step. It moves in anticlockwise direction from problem figure (1) to (3) and from problem figure (3) to (5) while the shaded part moves one step from problem figure (2) to (4) and from problem figure (4) to answer figure. The other design moves diagonally downward and upward after being rotated through 90° anticlockwise. The design is replaced with a new design after every two figures.

- 34. (a) In the subsequent figures the design moves respectively one, two, three, four, fivestep(s) in anticlockwise direction and it is replaced with a new design in each subsequent figure.
- 35. (c) In each subsequent figure, upper-middle leaf gets shaded first half then second half; after that next leaf gets shaded lower half then upper-half. Hence clockwise leaf will shade first upper half then lower half.
- 36. (b) In each subsequent figure, upper one new design appears after changing direction and comes lower one by one.
- 37. (e) In each subsequent figure, all four designs take next position clockwise; after that one new design appears from right-upper to lower then left-lower to upper respectively.
- 38. (c) In the subsequent figures the design rotates through 90° and 45° anticlockwise alternately, the smaller designs move one step anticlockwise and one design is replaced with a new design.
- 39. (e) From problem figure (1) to (2) all the three line segments are inverted. Similar changes occur from problem figure (3) to (4) and from problem figure (5) to answer figure.



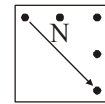
(1) to (2)
(3) to (4)
(5) to (6)



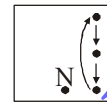
(2) to (3)
(4) to (5)

- 40. (c) From problem figure (1) to (2) the two left designs move to the right side and the two right side designs move to the left side. Again, one design in each pair is inverted. From problem figure (2) to (3) all the designs are inverted. These two steps are repeated alternately in subsequent figures.
- 41. (a) From problem figure (1) to (2) one curve is added. From problem figure (2) to (3) the first curve is inverted and one more curve is added. From problem figure (3) to (4) and in the subsequent figures the curves move one step in anticlockwise direction and all the curves are inverted.
- 42. (d) In the subsequent figures the existing design moves in anticlockwise direction and one square is added with different shading pattern.
- 43. (b) In each subsequent figure a line segment is added in anticlockwise direction.
- 44. (b) From problem figure (1) to (2) two designs move diagonally and one of these two designs is replaced with a new design. The other two designs move to the other side of line segment. Similar changes occur from problem figure (3) to (4) and from problem figure (5) to answer figure.
- 45. (e) From problem figure (1) to (2) the last design moves to the first position and is replaced with a new design. From problem figure (2) to (3) the designs move half

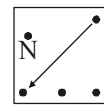
step in clockwise direction and the first and the last designs interchange position and the first design is replaced with a new design. From problem figure (3) to (4) the last design moves to the second position and the third design moves to the first position and is replaced with a new design. From problem figure (4) to (5) the designs move half step in clockwise direction and the first and the last designs interchange positions. From problem figure (5) to answer figure the last design would move to the first position and the design which has become the last design would be replaced with a new design.



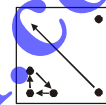
From (1) to (2)



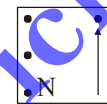
(2) to (3)



From (3) to (4)



(4) to (5)

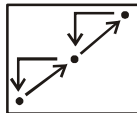


(5) to (6)

- 46. (c) From problem figure (1) to (2) the design is inverted and moves one step in anticlockwise direction. Also a new design appears ahead of the pre-existing design. Similar changes occur from problem figure (3) to (4) and from problem figure (5) to answer figure.
- 47. (a) In the subsequent figures the leaflet rotates through 45° and 90° clockwise alternately, a new leaflet is added and alternately half leaflet and one leaflet become shaded.
- 48. (a) In the subsequent figures one unit of both designs is added alternately upto two figures and in the third step one unit of each design is added.
- 49. (a) All the designs are inverted in the subsequent figures. In the first step the top design is inverted at its place while two pairs of adjacent designs interchange positions. In the second step the lowermost design is inverted at its place and the other two pairs of adjacent designs interchange positions. These two steps are repeated alternately.
- 50. (e) In the first step the existing design rotates through 90° anticlockwise and a new design is added behind the pre-existing design. In the second step also the pre-existing designs rotate through 90° anticlockwise and interchange positions while a new design is added behind the pre-existing designs. The same process is continued in the subsequent figures.
- 51. (c) In the subsequent figures the pre-existing shaded portion moves respectively three, four, five, six, seven blocks in anticlockwise direction and two more blocks get shaded in each subsequent figure.
- 52. (d) In each subsequent figure all the designs move half-step in anticlockwise direction and in the first step all

the designs at even numbered positions are replaced with new designs and in the second step all the designs at odd numbered positions are replaced with new designs. The same process is continued in the subsequent figure.

53. (b) From problem figure (1) to problem figure (2) the design on both sides of the diagonal interchange places. This is repeated between (3) and (4) and so should be repeated from (5) to (6).
54. (d) The '=' and 'x' designs exchange places in successive figures. The '?' moves ACW 90° and 180° in successive figures. Also the 'S' moves as follows in successive figures and repeats this movement from (5) to (6) :



55. (a) The 'α' moves ACW successively 45°, 90°, 135°, The 'β' moves CW by 45° and 'γ' moves CW by 90° successively.
56. (c) The top design gets inverted from (1) to (2), the middle design gets inverted from (2) to (3) and the bottom design gets inverted from (3) to (4). This pattern is repeated.
57. (d) The main figure rotates by 45° in ACW direction in each step while the smaller element moves one place in CW direction in each step and comes in and out of main figure after two steps.
58. (d) In each step the uppermost element rotates by 90° in ACW direction and each element moves one place in CW direction.
59. (e) In each step one of the four elements is replaced by a new element and remaining three elements interchange places.
60. (e) In each step two elements interchange places and remaining three elements interchange places.
61. (e) In each step the whole figure rotates by 90° in ACW direction and in one step two elements interchange places and one remains constant while in the next step each element moves one place in ACW direction. These two steps occur alternately.
62. (b) From figure II to I one set of elements is replaced by a new set of elements while remaining two sets of elements remain the same and the total number of elements is decreased by one.
63. (c) From figure II to I out of six arcs, three change direction while the other three remain in the same direction.
64. (a) From figure II to I the first element from top and third element from top interchange places and get inverted while second and fourth elements interchange places and only one is inverted.
65. (a) From figure I to II the whole figure gets reversed at its position. Half of upper figure gets shaded while the right half of lower figure disappears.

66. (c) From figure I to II the right most figure becomes large and left and middle figures get inside it. The middle figure gets inverted.
67. (a) From figure I to II the whole figure rotates one and half places in ACW direction and one figure is changed into a new figure.
68. (d) From figure I to II all the elements rotate by either 90° or 135° and interchange places in a particular way and at upper left position a new element appears.
69. (e) From figure I to II the whole figure gets inverted at its position and a line segment appears.
70. (a) From figure II to I each figure moves one place in CW direction. Both B-like figures rotate by 90° in ACW direction and then unshaded figure gets inverted. The figure with small circle at the tip also gets inverted.
71. (b) From figure II to I, the whole figure rotates by 90° in ACW direction and two pairs of smaller elements on either side of the main figure interchange places with each other. The triangle gets inverted.
72. (d) From figure II to I the innermost figure rotates by 90° in CW direction and becomes the outermost figure. The outermost figure rotates by 90° in ACW direction and becomes the middle figure. The middle figure rotates by 90° in CW direction and becomes the innermost figure.
73. (b) From figure II to I the whole figure rotates by 135° in CW direction and one petal disappears while the arc goes to the other side and changes direction.
74. (c) From figure II to I all four segments are joined and two upper elements move diagonally and get inverted while two lower elements move to left and right positions and rotate by 90° in CW direction.
75. (c) From (A) to (B) the top half of both designs get cut. So (c) will change to option (c) in the Answer figures.
76. (d) From (A) to (B) both the designs get sliced in the middle. They also exchange places and the pieces with lines the middle get inverted. Also one vertical line is added in design on the left. So (d) will replace the '?'
77. (a) The whole figure rotates by 90° in CW direction in each step and the straight line moves two places in CW direction and comes in and out of pentagon alternately.
78. (b) An arc forming petal is added in each step.
79. (c) In each step the whole figure moves half-a-side in CW direction and 2, 2, 3 elements are replaced by new elements in each step.
80. (d) Out of six, four elements change side in each step.
81. (d) Pattern gets repeated after three steps.



NUMBER SYSTEM

NUMBER SYSTEM

A number system relates quantities and symbols. The base or radix of a number system represents the number of digits or basic symbols in that particular number system.

Decimal is a base (or radix) 10 numeral system. This means that the system has ten symbols or numerals to represent any quantity. These symbols are called Digits. The ten symbols are 1, 2, 3, 4, 5, 6, 7, 8, 9 and 0.

Types of Numbers :

Real numbers: Real numbers comprise the full spectrum of numbers. They can take on any form – fractions or whole numbers, decimal points or no decimal points. The full range of real numbers includes decimals that can go on forever and ever without end.

They can be represented on a number line.

For Example: 8, 6, $2 + \sqrt{3}$, $\frac{3}{5}$ etc.

Natural numbers: Natural Numbers are counting numbers from 1, 2, 3, 4, 5,

Whole numbers: Whole numbers comprise as natural numbers and zero.

So, 0, 1, 2, 3, 4, 5, and so on upto infinity are whole numbers.

Integers: Integers incorporate all the qualities of whole numbers and their opposites (or additive inverses of the whole numbers). Integers can be described as being positive and negative whole numbers.

For Example: ... -3, -2, -1, 0, 1, 2, 3, ...

Rational numbers: All numbers of the form $\frac{p}{q}$ where p and q are

integers, but $q \neq 0$ are called Rational numbers.

For Example: $4, \frac{3}{4}, 0, \dots$

Irrational numbers: Irrational numbers are the opposite of rational numbers. Irrational numbers are non-terminating and non-recurring number.

For Example: $\sqrt{7}, \sqrt{5}, 2 + \sqrt{2}, \pi, \dots$

Even numbers: An even number is one leaves no remainder, when divided by 2

Odd numbers: An odd number is one that does not divide completely by two, such as 1, 3, 5, and 7.

Prime numbers: A prime number is a number which can be divided only by 1 and itself. The prime number has only two factors, 1 and itself. Prime numbers generally take the form of $6n \pm 1$ 2 is the only even number which is also a prime number.

For example: 2, 3, 5, 7, 11, 13, 17, ... are prime numbers.

Composite Number: A Composite Number is a number which can be divided into a number of factors other than 1 and itself. Any composite number has additional factors than 1 and itself.

For example: 4, 6, 8, 9, 10, ...

1 is neither a prime nor a composite number.

Co-primes or Relatively prime numbers: A pair of numbers not having any common factors other than 1 or -1. (Or alternatively their greatest common factor is 1 or -1)

For Example: 15 and 28 are co-prime, because the factors of 15 (1, 3, 5, 15), and the factors of 28 (1, 2, 4, 7, 14, 28) are not in common (except for 1).

Twin Primes: A pair of prime numbers that differ by 2 (successive odd numbers that are both Prime numbers).

For Example: (3, 5), (5, 7), (11, 13), ...

Imaginary Number: Number in the form $\sqrt{-a}$ are imaginary number.

PLACE VALUE AND FACE VALUE

In decimal number system, the value of a digit depends on its place or position in the number. Each place has a value of 10 times the place to its right.

Place value : Place value is a positional system of notation in which the position of a number with respect to a point determines its value.

Face value : The face value of a number is the value of the number without regard to where it is in relation to another number. So 7 always has a face value of 7, whether it belongs to 247 or 742. However the place value includes the position of the number in another number. So in the number 4,732, the 7 has a place value of 700, but has a face value of just 7.

NAMES OF DIGITS ACCORDING TO THEIR PLACE VALUE.

Indian Method	International Method		
Unit	Unit	1	1
Ten	Ten	10	10^1
Hundred	Hundred	100	10^2
Thousand	Thousand	1000	10^3
Ten thousand	Ten thousand	10000	10^4
Lakh	Hundred thousand	100000	10^5
Ten lakh	One million	1000000	10^6
Crore	Ten million	10000000	10^7
Ten crore	Hundred million	100000000	10^8
Arab	Billion	1000000000	10^9

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FRACTIONS

A fraction is known as a rational number and written in the form

of $\frac{p}{q}$ where p and q are integers and $q \neq 0$. ' q ' is termed as denominator and ' p ' is termed as numerator.

Type of Fractions :

Proper Fraction: The fraction in which numerator is less than the denominator is called a proper fraction.

For Example: $\frac{2}{3}, \frac{5}{6}, \frac{10}{11}$ etc.

Improper fraction : The fraction in which numerator is greater than the denominator is called improper fraction.

For Example : $\frac{3}{2}, \frac{6}{5}, \frac{8}{7}$, etc

Mixed fraction : Mixed fraction is a composite of a fraction and a whole number.

For example: $2\frac{1}{2}, 3\frac{3}{4}, 5\frac{6}{7}$ etc.

Complex fraction: A complex fraction is that fraction in which numerator or denominator or both are fractions.

For Example: $\frac{\frac{2}{3}}{\frac{4}{5}}, \frac{\frac{2}{5}}{\frac{6}{7}}, \frac{\frac{3}{7}}{\frac{5}{6}}$, etc.

Decimal fraction: The fraction whose denominator is 10 or its higher power, is called a decimal fraction.

For Example: $\frac{7}{10}, \frac{11}{100}, \frac{12}{1000}$

Continued fraction: Fractions which contain addition or subtraction of fractions or a series of fractions generally in denominator (sometimes in numerator also) are called continued fractions.

It is also defined as fractions whose numerator is an integer and whose denominator is an integer plus a fraction.

For Example: $2 - \frac{\frac{2}{2+\frac{3}{4}}}{4}$

Comparison of Fractions :

❖ **If the denominators of all the given fractions are equal then the fraction with greater numerator will be the greater fraction.**

For Example: $\frac{4}{7}, \frac{2}{7}, \frac{8}{7}, \frac{9}{7}$

then, $\frac{9}{7} > \frac{8}{7} > \frac{4}{7} > \frac{2}{7}$

❖ **If the numerators of all the given fractions are equal then the fraction with smaller denominator will be the greater fraction.**

For Example: $\frac{7}{4}, \frac{7}{2}, \frac{7}{8}, \frac{7}{9}$

then, $\frac{7}{2} > \frac{7}{4} > \frac{7}{8} > \frac{7}{9}$

❖ **When numerator is greater than denominator and the differences of numerator and denominator are equal, then the fraction with smaller numerator will be the greater fraction.**

For Example: $\frac{5}{2}, \frac{7}{4}, \frac{11}{8}, \frac{8}{5}$

then, $\frac{5}{2} > \frac{7}{4} > \frac{8}{5} > \frac{11}{8}$

Quicker Method (Cross Multiplication) :

This is a shortcut method to compare fractions. Using this method we can compare all types of fractions.

$$5 \times 7 = 35 \qquad 9 \times 4 = 36$$

$$\frac{5}{9} ? \frac{4}{7}$$

The fraction whose numerator is in the greater product is greater.

Since 36 is greater than 35, hence, $\frac{4}{7} > \frac{5}{9}$

LCM AND HCF

Factors and Multiples : If a number x divides another number y exactly, we say that x is a factor of y . Also y is called a multiple of x . So, if we take an example 9, 4 & 16, then we can say that 4 is a factor 9, 16 (because it divides it completely) and 16 is a multiple of 4 (because 16 comes in the table of 4)

Highest Common Factor (HCF) :

The H.C.F. of two or more than two numbers is the greatest number that divides each one of them completely. There are two methods for determining H.C.F.:

1. **Prime factorization method :** We can determine the H.C.F. of 144, 180 and 108 from following process.

$$144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$$

$$108 = 2 \times 2 \times 3 \times 3 \times 3$$

$$180 = 2 \times 2 \times 3 \times 3 \times 5$$

The common factors are –

$$2 \times 2 \times 3 \times 3 = 36.$$

Thus, required H.C.F. of 144, 180 and 108 is 36.

2. **Division Method:** We can determine the H.C.F. of above mentioned numbers from the following process :

$$\begin{array}{r} 144 \overline{) 180} \left(1 \right. \\ \underline{144} \\ 36 \end{array} \qquad \begin{array}{r} 144 \overline{) 144} \left(4 \right. \\ \underline{144} \\ \end{array}$$

Thus, the H.C.F of 144 and 180 is 36.
Now, we find the H.C.F of 36 and 108.

$$36 \overline{) 108} \begin{array}{l} 3 \\ \times \times \\ \hline \end{array}$$

So, required H.C.F is 36.

Lowest Common Multiple (LCM) :

The L.C.M. of two or more than two numbers is the least number which is exactly divisible by each one of the given numbers. Or in other words, it is the least number which is the multiple of all the numbers.

We can determine L.C.M. of two or more given numbers by the following two methods:

1. **Prime Factorization method:** Suppose we have to find the L.C.M. of 12, 16 and 30, then

$$\begin{aligned} 12 &= 2 \times 2 \times 3 \\ 16 &= 2 \times 2 \times 2 \times 2 \\ 30 &= 2 \times 3 \times 5 \end{aligned}$$

Thus, required L.C.M. of the given numbers
 $= 2 \times 2 \times 2 \times 2 \times 3 \times 5 = 240$

2. **Division method:** We can determine the L.C.M. of above mentioned numbers from the following process :

$$\begin{array}{r} 2 \overline{) 12, 16, 30} \\ 2 \overline{) 6, 8, 15} \\ 3 \overline{) 3, 4, 15} \\ 1, 4, 5 \end{array}$$

Thus, required L.C.M. of the given number
 $= 2 \times 2 \times 3 \times 1 \times 4 \times 5 = 24$

Note-

It must be remembered that while computing HCF only common factors are considered, but in the computation of LCM all the factors, whether common or not, are considered.

H.C.F. and L.C.M. of Fractions:

$$\text{H.C.F. of fractions} = \frac{\text{H.C.F. of Numerators}}{\text{L.C.M. of Denominators}}$$

For Example, we have to find the H.C.F. of $\frac{1}{2}$ and $\frac{3}{4}$.

$$\text{Then, H.C.F. of } \frac{1}{2} \text{ and } \frac{3}{4} = \frac{\text{H.C.F. of 1 and 3}}{\text{L.C.M. of 2 and 4}} = \frac{1}{4}$$

$$\text{L.C.M of fractions} = \frac{\text{L.C.M. of Numerators}}{\text{H.C.F. Denominators}}$$

For Example, we have to find the L.C.M. of $\frac{1}{2}$ and $\frac{3}{4}$.

$$\text{Then, L.C.M. of } \frac{1}{2} \text{ and } \frac{3}{4} = \frac{\text{L.C.M. of 1 and 3}}{\text{H.C.F. of 2 and 4}} = \frac{3}{2}$$

Standard Formula:

$\text{LCM} \times \text{HCF} = \text{product of two numbers.}$

It should be remembered that the above formula holds true only for 2 numbers, but if the numbers are relatively prime, then the above formula can be used for any number of number.

Some Questions based on HCF & LCM:

ILLUSTRATION 1:

Time & Work

Mohan can do a piece of work in 15 days and Sohan can complete the same work in 20 days. In how many days, can both working together can complete the work?

Solution:

In such type of questions, first the LCM of 15 and 20 should be completed, which comes out to be 60.

Then, number of days taken by both of them to complete the work

$$= \frac{60}{\frac{60}{15} + \frac{60}{20}} = \frac{60}{4+3} = \frac{60}{7}$$

$= 8\frac{4}{7}$ days will be taken by them to complete the work, working together.

ILLUSTRATION 2:

Time, Speed and Distance in case of circular motion

Usha is running at a speed of 25m/sec and Shiny is running at a speed of 20 m/sec, around a circular track of 2000m in the same direction. After how much time will they meet at the starting point, if they start running at the same time?

Solution:

Time taken by Usha to

$$\text{Complete one circle} = \frac{\text{Distance}}{\text{Speed}}$$

$$= \frac{2000}{25} = 80 \text{ secs}$$

$$\text{Time taken by Shiny to complete one circle} = \frac{\text{Distance}}{\text{speed}}$$

$$= \frac{2000}{20} = 100 \text{ secs}$$

Now, to find their meeting point, we will be required to find the LCM of 80 and 100 which is 400 secs. So, they will meet

at the starting point after 400 secs as $6\frac{6}{7}$ mins.

ILLUSTRATION 3:

Number of Rows

There are 36 Apples, 72 Mangoes and 48 Cherries to be arranged in rows in such a way that each row contains same number of fruits of one type. How many rows are required to fulfill this condition?

Solution:

$$\text{No. of rows required} = \frac{\text{LCM of 36, 72 \& 48}}{\text{HCF of 36, 72 \& 48}}$$

$$= \frac{144}{12} = 12 \text{ rows are required.}$$

Illustration 4**Ringling the Bell**

There are two bells in a temple. The first bell rings after every 60 seconds and the second bell rings after every 75 seconds. After how much time will they ring together for the first time?

Solution:

To find, when the bells will ring together, we will be required to find the LCM of the time intervals. So, LCM of 60 and 75 seconds = 300 seconds, so, the bells will ring together for the first time after 300 seconds.

Illustration 5**To find a number fulfilling a given condition**

There is a number which when divided by 3 and 4 gives 2 as remainder. Which is the lowest three digit number which satisfies this condition?

Solution:

LCM of 3 and 4 = 12

Remainder of 3 implies that the number should be in the form $(12N + 2)$ so, the numbers are 14, 26, 38, 50, 62, 74, 86, 98, 110,.....

So, the answer is 110.

Formulae to Remember

❖ The product of two numbers = (HCF of the numbers) \times (LCM of the numbers)

❖ Sum of first n natural numbers = $\frac{n(n+1)}{2}$

❖ Sum of first n even numbers = $\frac{\text{Last even number}(\text{last even number} + 2)}{4}$

❖ Sum of first n odd numbers = $\left(\frac{\text{last odd number} + 1}{2}\right)^2$

In the sequence, $A, A + D, A + 2D, A + 3D, \dots$ Nth term = $A + (N - 1)D$

and sum of N terms = $\frac{N}{2}[2A + (N - 1)D]$

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Rules of Divisibility

These rules let you test if one number can be evenly divided by another, without having to do too much calculation!

(Divisibility Conditions)		
A number is divisible by	If	Example
2	The last digit is even (0, 2, 4, 6, 8)	128 is 129 is not
3	The sum of the digits is completely divisible by 3	381 (3 + 8 + 1 = 12, and 12 ÷ 3 = 4) Yes 217 (2 + 1 + 7 = 10, and 10 ÷ 3 = 3 $\frac{1}{3}$) No
4	The last 2 digits are completely divisible by 4	1312, (12 ÷ 4 = 3) is 7019 is not
5	The last digit is 0 or 5	175 is 809 is not
6	The number is completely divisible by both 2 and 3	114 (it is even and 1 + 1 + 4 = 6 and 6 ÷ 3 = 2) Yes if 308 (it is even but 3 + 0 + 8 = 11 and 11 ÷ 3 = 3 $\frac{2}{3}$) No
7	If you double the last digit and subtract it from the rest of the number and the answer is : 0 or a multiple of 7 (Note : for bigger numbers you can apply this rule to the answer again if you want)	672 (Double 2 is 4, 67 - 4 = 63, and 63 ÷ 7 = 9) Yes 905 (Double 5 is 10, 90 - 10 = 80, and 80 ÷ 7 = 11 $\frac{3}{7}$) No
8	The last three digits are divisible by 8	109816 (816 ÷ 8 = 102) Yes 216302 (302 ÷ 8 = 37 $\frac{3}{4}$) No
9	The sum of the digits is divisible by 9 (Note : for bigger numbers you can apply this rule to the answer again if you want)	1629 (1 + 6 + 2 + 9 = 18, and again, 1 + 8 = 9) Yes 2013 (2 + 0 + 1 + 3 = 6) No
10	The number ends in 0	220 is 221 is not
11	If the difference of the sum of the digits at odd places and the sum of the digits at even places is 0 or a multiple of 11	1364 ((3 + 4) - (1 + 6) = 0) Yes 25176 ((5 + 7) - (2 + 1 + 6) = 3) No
12	(i) The number is divisible by 3 and 4 both, or (ii) If you subtract the last digit from twice the rest of the number and the answer is : 0 or a multiple of 12 (Note : for bigger numbers this can be applied repeatedly)	648 (6 + 4 + 8 = 18 and 18 ÷ 3 = 6, and 48 ÷ 4 = 12) Yes 916 (9 + 1 + 6 = 16, 16 ÷ 3 = 5 $\frac{1}{3}$) No

(Divisibility Conditions)		
A number is divisible by	If	Example
13	A + 4B should be a multiple of 13, where B is the unit's digit and A is the remaining part of the number	572, in the given no, B = 2 and A = 57. According to the condition, $57 + 4 \times 2 = 65$ 65 is a multiple of 13, therefore 572 is divisible by 13.
14	Number should fulfill the divisibility test of both 2 and 7	266 is 978 is not
15	Sum of the digits should be divisible by 3 and unit's digit should be 0 or 5	5685 is 1825 is not
16	Last 4 digits of the number should be divisible by 16.	176 is 809 is not
17	A - 5B should be a multiple of 17, where B is the unit's digit and A is the remaining part of the number.	595, in the given no. B = 5 and A = 59. According to the condition, $59 - 5 \times 5 = 34$ 34 is a multiple of 17, therefore 595 is divisible by 17.
18	Number should satisfy the divisibility test of both 2 and 9	
19	(A + 2B) should be a multiple of 19, where B is the unit's digit and A is the remaining part of the number.	1653, in the given no; B = 3 and A = 165 According to the condition, $165 + 2 \times 3 = 171$ 171 is a multiple of 19, therefore 1653 is divisible by 19.
20	The number should satisfy the divisibility test of both 4 and 5.	400 is 490 is not
25	Last 2 digits = 25, 50 or 75	
50	Last 2 digits = 50 or 00	

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SOLVED EXAMPLES

EXAMPLE ► 1: If an amount of ₹ 198011 is distributed equally amongst 47 persons, how much amount would each person get ?

- (a) ₹ 4123 (b) ₹ 4231
 (c) ₹ 4213 (d) ₹ 4132
 (e) None of these

Sol. (c) Sum received by each person = ₹ $\left(\frac{198011}{47}\right) = ₹ 4213$

EXAMPLE ► 2: A company canteen requires 798 bananas per week. Totally how many bananas will it require for the months of January, February and March, 2008 if the number of employees did not change during this period ?

- (a) 10480 (b) 10277
 (c) 10586 (d) 10374
 (e) None of these

Sol. (d) Number of days in the months of January, February and March in 2008

$$= 31 + 29 + 31 = 91 \text{ days} = 91 \div 7 \text{ weeks} = 13 \text{ weeks}$$

$$\therefore \text{Consumption of bananas in 1 week} = 798$$

$$\therefore \text{Consumption of bananas in 13 weeks}$$

$$= 13 \times 798 = 10374$$

EXAMPLE ► 3: The cost of 2 rings and 4 bangles is ₹ 46854.

What is the cost of 5 rings and 10 bangles ?

- (a) ₹ 115345 (b) ₹ 117135
 (c) ₹ 116675 (d) Cannot be determined
 (e) None of these

Sol. (b) Let the CP of 1 ring and 1 bangle be ₹ x and ₹ y respectively.

$$2x + 4y = 46854$$

$$\Rightarrow 2.5(2x + 4y) = 2.5 \times 46854$$

$$\Rightarrow 5x + 10y = ₹ 117135$$

EXAMPLE ► 4: If the sum of four consecutive even numbers is 228, which is the smallest of the numbers ?

- (a) 52 (b) 54
 (c) 56 (d) 48
 (e) None of these

Sol. (b) According to the question,

$$x + x + 2 + x + 4 + x + 6 = 228$$

$$\Rightarrow 4x + 12 = 228$$

$$\Rightarrow 4x = 228 - 12 = 216$$

$$\therefore x = \frac{216}{4} = 54$$

$$\therefore \text{The smallest even number} = 54$$

EXAMPLE ► 5: The difference between a two-digit number and the number obtained after interchanging the two digits of the two-digit number is 27. The sum of the two digits of the two-digit number is 15. What is the two-digit number ?

- (a) 87 (b) 96
 (c) 69 (d) Cannot be determined
 (e) None of these

Sol. (d) Let the two digit number be $10x + y$, where x is the first digit and y the second digit.

$$\therefore (10x + y) - (10y + x) = 27$$

$$9x - 9y = 27$$

$$x - y = 3 \quad \dots(a)$$

$$\text{also } x + y = 15 \quad \dots(b)$$

$$\therefore x = 9 \text{ and } y = 6$$

$$\therefore \text{Required number is 96 or 69}$$

Alternate Method:

This question can also be solved with the help of the options given.

'a' option is 87

On interchanging the digits, we get 78

Difference = 9, which is not the difference according to that specified in question.

'b' option is 96

On interchanging we get 69

Difference = 27

\therefore Correct answer is 96.

EXAMPLE ► 6: Five bells begin to toll together at intervals of 9 seconds, 6 seconds, 4 seconds, 10 seconds and 8 seconds respectively. How many times will they toll together in the span of one hour (excluding the toll at the start)?

- (a) 5 (b) 8
 (c) 10 (d) Cannot be determined
 (e) None of these

Sol. (c)

2	9, 6, 4, 10, 8
2	9, 3, 2, 5, 4
3	9, 3, 1, 5, 2
	3, 1, 1, 5, 2

$$\therefore \text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 360 \text{ sec.}$$

$$\text{No. of times they will toll together} = \frac{3600}{360} = 10$$

So they will toll together 10 times in 1 hour.

EXAMPLE ▶ 7 : Samantha, Jessica and Roseline begin to jog around a circular stadium. They complete their one lap around the stadium in 84 seconds, 56 seconds and 63 seconds respectively. After how many seconds will they be together at the starting point?

- (a) 336
- (b) 504
- (c) 252
- (d) Cannot be determined
- (e) None of these

Sol. (b) LCM of 84, 56, 63

$$\begin{array}{r|l} 2 & 84, 56, 63, \\ 2 & 42, 28, 63, \\ 7 & 21, 14, 63, \\ 3 & 3, 2, 9 \\ \hline & 1, 2, 3, \end{array}$$

$$\therefore 2 \times 2 \times 7 \times 3 \times 2 \times 3 = 504$$

Hence, all three persons will be together at the starting point after 504 seconds.

EXAMPLE ▶ 8 : If the fractions $\frac{2}{5}, \frac{3}{8}, \frac{4}{9}, \frac{5}{13}$ and $\frac{6}{11}$ are arranged in ascending order of their values, which one will be the fourth?

- (a) $\frac{4}{9}$
- (b) $\frac{5}{13}$
- (c) $\frac{3}{8}$
- (d) $\frac{2}{5}$
- (e) None of these

Sol. (a) $\frac{2}{5} = 0.4, \quad \frac{3}{8} = 0.375,$

$$\frac{4}{9} = 0.44, \quad \frac{5}{13} = 0.38,$$

$$\frac{6}{11} = 0.54$$

\therefore Ascending order is

$$= \frac{3}{8}, \frac{5}{13}, \frac{2}{5}, \frac{4}{9}, \frac{6}{11}$$

So the fourth one will be $\frac{4}{9}$.

EXAMPLE ▶ 9 : Bhuvan has some hens and some cows. If the total number of animal-heads are 71 and the total number of feet are 228, how many hens does Bhuvan have ?

- (a) 43
- (b) 32
- (c) 24
- (d) Cannot be determined
- (e) None of these

Sol. (e) Let Bhuvan have x hens and y cows

According to the question,

$$x + y = 71 \quad \dots(i)$$

$$2x + 4y = 228 \quad \dots(ii)$$

Multiply equation (i) by 4 and subtract equation (ii) from it:

$$4x + 4y - 2x - 4y = 284 - 228$$

$$\text{or, } 2x = 56$$

$$\text{or, } x = \frac{56}{2} = 28$$

$$\therefore \text{Number of hens} = 28$$

EXAMPLE ▶ 10 : $\frac{1}{4}$ th of $\frac{2}{5}$ th of a number is 82. What is the number?

- (a) 410
- (b) 820
- (c) 420
- (d) 220
- (e) None of these

Sol. (b) Let the number be $= x$

According to the question,

$$x \times \frac{2}{5} \times \frac{1}{4} = 82$$

$$\text{or, } x = \frac{82 \times 5 \times 4}{2} = 820$$

EXERCISE

1. What is 456 times 121?
 - (a) 56453
 - (b) 54167
 - (c) 55176
 - (d) 54155
 - (e) None of these
2. The product of two consecutive even numbers is 12768. What is the greater number?
 - (a) 110
 - (b) 108
 - (c) 114
 - (d) 112
 - (e) None of these
3. An amount of ₹ 50176 is distributed equally amongst 32 persons. How much amount would each person get?
 - (a) ₹ 1,555
 - (b) ₹ 1,478
 - (c) ₹ 1,460
 - (d) ₹ 1,568
 - (e) None of these
4. If an amount of ₹ 1,72,850 is equally distributed amongst 25 people, how much amount would each person get?
 - (a) ₹ 8912.50
 - (b) ₹ 8642.50
 - (c) ₹ 7130
 - (d) ₹ 6914
 - (e) None of these
5. The sum of four consecutive even numbers. A, B, C, and D is 180. What is the sum of the set of next four consecutive even numbers?
 - (a) 214
 - (b) 212
 - (c) 196
 - (d) 204
 - (e) None of these
6. What is 786 times 964?
 - (a) 759276
 - (b) 749844
 - (c) 75416
 - (d) 757704
 - (e) None of these
7. The difference between a two-digit number and the number obtained by interchanging the two digits of the number is 18. The sum of the two digits of the number is 12. What is the product of the two digits of the two digits number?
 - (a) 35
 - (b) 27
 - (c) 32
 - (d) Cannot be determined
 - (e) None of these
8. What is 783 times 869?
 - (a) 678689
 - (b) 678861
 - (c) 680427
 - (d) 681993
 - (e) None of these
9. There are 15 dozen candles in a box. If there are 39 such boxes. How many candles are there in all the boxes together?
 - (a) 7020
 - (b) 6660
 - (c) 6552
 - (d) 3510
 - (e) None of these
10. Monica, Veronica and Rachael begin to jog around a circular stadium. They complete their one lap in 48 seconds, 64 seconds and 72 seconds respectively. After how many seconds will they be together at the starting point?
 - (a) 336
 - (b) 252
 - (c) 576
 - (d) Cannot be determined
 - (e) None of these
11. The product of two consecutive odd numbers is 19043. Which is the smaller number?
 - (a) 137
 - (b) 131
 - (c) 133
 - (d) 129
 - (e) None of these
12. What is 131 times 333?
 - (a) 46323
 - (b) 43623
 - (c) 43290
 - (d) 44955
 - (e) None of these
13. The product of two successive numbers is 8556. What is the smaller number?
 - (a) 89
 - (b) 94
 - (c) 90
 - (d) 92
 - (e) None of these
14. A canteen requires 112 kgs of wheat for one week. How many kgs of wheat will it require for 69 days?
 - (a) 1,204kgs
 - (b) 1,401kgs
 - (c) 1,104kgs
 - (d) 1,014kgs
 - (e) None of these
15. If an amount of Rs 41,910 is distributed equally amongst 22 persons, how much amount would each person get?
 - (a) ₹1905
 - (b) ₹2000
 - (c) ₹745
 - (d) ₹765
 - (e) None of these
16. The product of two consecutive even numbers is 4488. Which is the smaller number?
 - (a) 62
 - (b) 71
 - (c) 66
 - (d) 65
 - (e) None of these
17. A canteen requires 21 dozen bananas for one week. How many dozen bananas will it require for 54 days?
 - (a) 162
 - (b) 1944
 - (c) 165
 - (d) 2052
 - (e) None of these

18. If an amount of ₹ 72,128 is distributed equally amongst 46 persons how much amount would each person get?
- (a) ₹1555 (b) ₹1478
(c) ₹1460 (d) ₹1568
(e) None of these
19. What is 234 times 167 ?
- (a) 42768 (b) 41184
(c) 40581 (d) 39078
(e) None of these
20. What is the least number to be added to 1500 to make it a perfect square?
- (a) 20 (b) 21
(c) 22 (d) 23
(e) None of these
21. The sum of three consecutive integers is 39. Which of the following is the largest among the three?
- (a) 12 (b) 15
(c) 13 (d) 16
(e) None of these
22. How many pieces of 8.6 metres length cloth can be cut out of a length of 455.8 metres cloth?
- (a) 43 (b) 48
(c) 55 (d) 53
(e) 62
23. What is 184 times 156?
- (a) 28704 (b) 29704
(c) 30604 (d) 27604
(e) None of these
24. If an amount of ₹ 15,504 is divided equally among 76 students, approximately how much amount will each student get?
- (a) ₹206 (b) ₹210
(c) ₹204 (d) ₹218
(e) ₹212
25. There are 12 dozen mangoes in a box. If there are 43 such boxes, how many mangoes are there in all the boxes together?
- (a) 516 (b) 3096
(c) 6192 (d) 628
(e) None of these
26. What is 768 times 859?
- (a) 656276 (b) 661248
(c) 658176 (d) 659712
(e) None of these
27. A canteen requires 13 dozen bananas per day. How many bananas will it require for 9 weeks?
- (a) 728 (b) 9828
(c) 1404 (d) 9882
(e) None of these
28. The cost of 3 chairs and 10 tables is ₹ 9856. What is the cost of 6 chairs and 20 tables?
- (a) ₹17227 (b) ₹18712
(c) ₹19172 (d) Cannot be determined
(e) None of these
29. An amount of ₹123098 is distributed equally amongst 61 persons. How much amount would each person get?
- (a) ₹2018 (b) ₹2108
(c) ₹2258 (d) ₹2388
(e) None of these
30. What is 963 times 788 ?
- (a) 757268 (b) 759632
(c) 758056 (d) 758844
(e) None of these
31. $\frac{3}{5}$ of a number is 250 more than 40% of the same number. What is the number?
- (a) 1250 (b) 1180
(c) 1200 (d) 1220
(e) none of these
32. A canteen requires 4,560 kgs of rice for 30 days. How many kgs, of rice does the canteen require for one week?
- (a) 1078 kgs (b) 944 kgs
(c) 1054kgs (d) 1068 kgs
(e) None of these
33. If an amount of ₹ 13,957 is divided equally among 45 people, how much approximate amount will each person get?
- (a) ₹330 (b) ₹250
(c) ₹275 (d) ₹310
(e) None of these
34. Three girls start jogging from the same point around a circular track and they complete one round in 24 seconds, 36 seconds and 48 seconds respectively. After how much time will they meet at one point?
- (a) 2 minutes, 20 seconds
(b) 2 minutes, 24 seconds
(c) 4 minutes 12 seconds
(d) 3 minutes 36 seconds
(e) None of these
35. The average of four consecutive even numbers is 27. What is the highest number?
- (a) 32 (b) 28
(c) 30 (d) 34
(e) None of these
36. Three friends A, B and C start running around a circular stadium and complete a single round in 24, 36 and 30 seconds respectively. After how many minutes will they meet again at the starting point?
- (a) 12 (b) 6
(c) 8 (d) 15
(e) 18

37. If the fractions $\frac{1}{2}$, $\frac{2}{3}$, $\frac{5}{9}$, $\frac{6}{13}$, and $\frac{7}{9}$ are arranged in ascending order of their values, which one will be the fourth ?
- (a) $\frac{2}{3}$ (b) $\frac{6}{13}$
 (c) $\frac{5}{9}$ (d) $\frac{7}{9}$
 (e) None of these
38. If the following fractions $\frac{7}{8}$, $\frac{4}{5}$, $\frac{8}{14}$, $\frac{3}{5}$ and $\frac{5}{6}$ are arranged in descending order which will be the last in the series?
- (a) $\frac{8}{14}$ (b) $\frac{7}{8}$
 (c) $\frac{4}{5}$ (d) $\frac{3}{5}$
 (e) $\frac{5}{6}$
39. If the fractions $\frac{2}{5}$, $\frac{3}{4}$, $\frac{4}{5}$, $\frac{5}{7}$ and $\frac{6}{11}$ are arranged in ascending order of their values, which one will be the fourth ?
- (a) $\frac{2}{5}$ (b) $\frac{3}{4}$
 (c) $\frac{4}{5}$ (d) $\frac{6}{11}$
 (e) $\frac{5}{7}$
40. The difference between two numbers is 3 and the difference between their squares is 63. Which is the larger number?
- (a) 12 (b) 9
 (c) 15 (d) Cannot be determined
 (e) None of these
41. If the difference between a number and two fifths of the number is 30, find the number.
- (a) 50 (b) 75
 (c) 57 (d) 60
 (e) None of these
42. If among 54 students each contributes ₹ 60, the amount to buy new books for the library can be collected. If 9 students drop out how much additional amount does each student have to pay ?
- (a) ₹ 18 (b) ₹ 10
 (c) ₹ 12 (d) Cannot be determined
 (e) None of these
43. If $(12)^3$ is subtracted from the square of a number the answer so obtained is 976. What is the number?
- (a) 58 (b) 56
 (c) 54 (d) 52
 (e) None of these
44. The cost of 5 chairs and 8 tables is ₹ 6,574. What is the cost of 10 chairs and 16 tables?
- (a) ₹ 15674 (b) ₹ 16435
 (c) ₹ 13148 (d) Cannot be determined
 (e) None of these
45. If $(56)^2$ is added to the square of a number, the answer so obtained is 4985. What is the number?
- (a) 52 (b) 43
 (c) 65 (d) 39
 (e) None of these
46. The difference between a number and one fifth of it is 84. What is the number?
- (a) 95 (b) 100
 (c) 105 (d) 108
 (e) 112
47. Kishan has some hens and some cows. If the total number of animal heads are 59 and the total number of feet are 190, how many cows does Kishan have ?
- (a) 36 (b) 32
 (c) 23 (d) Cannot be determined
 (e) None of these
48. Gopal has some hens and some goats. If the total number of animal heads are 43 and total number of feet are 142, how many hens does Gopal have?
- (a) 28 (b) 21
 (c) 15 (d) Cannot be determined
 (e) None of these
49. The difference between a two-digit number and the number obtained by interchanging the two digits of the number is 9. The sum of the digits of the number is 15. What is the product of the two digits of the two-digit number?
- (a) 54 (b) 72
 (c) 56 (d) Cannot be determined
 (e) None of these
50. The number obtained by interchanging the two digits of a two-digit number is less than the original number by 18. The sum of the two digits of the number is 16. What is the original number?
- (a) 97 (b) 87
 (c) 79 (d) Cannot be determined
 (e) None of these
51. If all the fractions $\frac{3}{5}$, $\frac{1}{8}$, $\frac{8}{11}$, $\frac{4}{9}$, $\frac{2}{7}$, $\frac{5}{7}$ and $\frac{5}{12}$ are arranged in the descending order of their values, which one will be the third?

- (a) $\frac{1}{8}$ (b) $\frac{4}{9}$
 (c) $\frac{5}{12}$ (d) $\frac{8}{11}$
 (e) None of these
52. Farah got married 8 years ago. Today her age is $1\frac{2}{7}$ times her age at the time of her marriage. At present her daughter's age is one-sixth of her age. What was her daughter's age 3 years ago?
 (a) 6 years (b) 2 years
 (c) 3 years (d) Cannot be determined
 (e) None of these
53. A, B, C, D and E are five consecutive odd numbers. The sum of A and C is 146. What is the value of E?
 (a) 75 (b) 81
 (c) 71 (d) 79
 (e) None of these
54. Seema's present age is four times her son's present age and four-seventh of her father's present age. The average of the present ages of all three of them is 32 years. What is the difference between the Seema's son's present age and Seema's father's present age?
 (a) 44 years (b) 48 years
 (c) 46 years (d) Cannot be determined
 (e) None of these
55. The sum of five consecutive even numbers of set A is 280. What is the sum of a different set B of five consecutive numbers whose lowest number is 71 less than double the lowest number of set A?
 (a) 182 (b) 165
 (c) 172 (d) 175
 (e) None of these
56. Deepak has some hens and some goats. If the total number of animal heads is 90 and the total number of animal feet is 248, what is the total number of goats Deepak has?
 (a) 32 (b) 36
 (c) 34 (d) Cannot be determined
 (e) None of these
57. The sum of the squares of two consecutive even numbers is 6500. Which is the smaller number?
 (a) 54 (b) 52
 (c) 48 (d) 56
 (e) None of these

ANSWER KEY

1	(c)	11	(a)	21	(e)	31	(a)	41	(a)	51	(e)
2	(c)	12	(b)	22	(d)	32	(e)	42	(c)	52	(c)
3	(d)	13	(d)	23	(a)	33	(d)	43	(d)	53	(d)
4	(d)	14	(c)	24	(e)	34	(b)	44	(c)	54	(b)
5	(b)	15	(a)	25	(c)	35	(c)	45	(b)	55	(d)
6	(d)	16	(c)	26	(d)	36	(b)	46	(c)	56	(c)
7	(a)	17	(a)	27	(b)	37	(a)	47	(a)	57	(d)
8	(c)	18	(d)	28	(e)	38	(a)	48	(e)		
9	(a)	19	(d)	29	(a)	39	(b)	49	(c)		
10	(c)	20	(b)	30	(d)	40	(a)	50	(a)		

ANSWERS & EXPLANATIONS

1. (c) $456 \times 121 = 55176$
2. (c) From the given alternatives,
 $112 \times 114 = 12768$
 \therefore Larger number = 114
 While attempting these types of questions, it is always advisable to multiply the number at unit's place to see if we are getting the same number in unit's place as given in the question.
 Now 1st option is 110, previous consecutive even number will be 108, $0 \times 8 = 0$, but the number given in the question has 8 at unit's digit, therefore 'a' cannot be the correct option, so, there is no need to waste your time over it.
3. (d) Amount received by each person
 $= ₹ \frac{50176}{32} = 1568$
4. (d) Amount received by each person
 $= \frac{172850}{25} = ₹ 6914$

$$\begin{aligned} 5. \quad (b) \quad A + A + 2 + A + 4 + A + 6 &= 180 \\ 4A + 12 &= 180 \\ A &= 42. \end{aligned}$$

\therefore Next four consecutive even numbers are
 $50 + 52 + 54 + 56 = 212$

$$6. \quad (d) \quad 786 \times 964 = 757704.$$

Alternate Method- (Using the options given) Again, start by multiplying unit's digits of 6 and 4 we get 24. It means that the last digit of the answer should be 4 now, we have two options that end with 4.

So, now we will multiply ten's digit as 8 and 6 we get 48. To this we add 2 from units digit. We get 50. It means that 10s digit should be 0. So, the correct option is 'd'.

$$7. \quad (a) \quad \text{Let the two-digit number be } = 10x + y, \text{ where } x > y$$

According to the question,

$$10x + y - 10y - x = 18$$

$$\text{or, } 9x - 9y = 18$$

$$\text{or, } 9(x - y) = 18$$

$$\text{or, } x - y = \frac{18}{9} = 2 \quad \dots(i)$$

$$\text{and, } x + y = 12 \quad \dots(ii)$$

From equations (i) and (ii)

$$2x = 14 \Rightarrow x = \frac{14}{2} = 7$$

From equation (ii)

$$y = 12 - 7 = 5$$

$$\therefore \text{ Required product } = xy = 7 \times 5 = 35$$

$$8. \quad (c) \quad 783 \times 869 = 680427$$

Try solving it with the help of options

$$9. \quad (a) \quad \text{Total number of candles} = 15 \times 12 \times 39 = 7020$$

$$10. \quad (c) \quad \text{Required time} = \text{LCM of } 48, 64 \text{ and } 72$$

2	48,	64,	72
2	24,	32,	36
2	12,	16,	18
2	6,	8,	9
3	3,	4,	9
	1,	4,	3

$$\text{LCM} = 2 \times 2 \times 2 \times 2 \times 3 \times 4 \times 3 = 576 \text{ seconds.}$$

$$11. \quad (a) \quad \text{Out of the given alternatives,}$$

$$137 \times 139 = 19043$$

$$\therefore \text{ Required smaller number} = 137$$

$$12. \quad (b) \quad ? = 333 \times 131 = 43623$$

$$13. \quad (d) \quad \text{Let the numbers be } x \text{ and } (x + 1),$$

$$\therefore x(x + 1) = 8556$$

$$\text{or, } x^2 + x - 8556 = 0$$

$$\text{or, } x^2 + 93x - 92x - 8556 = 0$$

$$\text{or, } (x^2 + 93)(x - 92) = 0$$

$$\therefore x = 92$$

Alternate Method-

Out of the given alternatives

$$92 \times 93 = 8556$$

$$14. \quad (c) \quad \text{Quantity of wheat for 7 days} = 112 \text{ kg}$$

$$\therefore \text{ Quantity of wheat for 1 day} = \frac{112}{7} \text{ kg}$$

$$\therefore \text{ Quantity of wheat for 69 days}$$

$$= \frac{112}{7} \times 69 = 1104 \text{ kg}$$

$$15. \quad (a) \quad \text{Required amount} = \frac{41910}{22} = ₹1905$$

$$16. \quad (c) \quad \text{Let the smaller number be } x$$

$$\therefore x \times (x + 2) = 4488$$

$$\Rightarrow x^2 + 2x - 4488 = 0$$

$$\Rightarrow (x + 68)(x - 66) = 0$$

$$\therefore x = 66$$

Also, from the given alternatives, it could be ascertained that $66 \times 68 = 4488$

$$17. \quad (a) \quad \text{Required number of bananas}$$

$$= \frac{21}{7} \times 54 = 162 \text{ dozen}$$

$$18. \quad (d) \quad \text{Amount received by each person}$$

$$= \frac{72128}{46} = ₹1568$$

$$19. \quad (d) \quad 234 \times 167 = 39078$$

$$20. \quad (b) \quad 38^2 = 1444$$

$$39^2 = 1521$$

$$\therefore \text{ Required number} = 1521 - 1500 = 21$$

$$21. \quad (e) \quad \text{Let the three consecutive integers be } x, x + 1 \text{ and } x + 2$$

According to the question,

$$x + x + 1 + x + 2 = 39$$

$$\text{or, } 3x + 3 = 39$$

$$\text{or, } 3x = 39 - 3 = 36$$

$$\text{or, } x = \frac{36}{3} = 12$$

$$\therefore \text{ Required largest number} = x + 2 = 12 + 2 = 14$$

Also, from the given alternatives, it could be ascertained that

$$12 + 13 + 14 = 39$$

$$22. \quad (d) \quad \text{Number of pieces} = \frac{455.8}{8.6} = 53$$

$$23. \quad (a) \quad \text{Required product} = 184 \times 156 = 28704$$

$$24. \quad (c) \quad \text{Amount received by each student}$$

$$= \frac{15504}{76} = ₹204$$

$$25. \quad (c) \quad \text{Number of mangoes} = 12 \text{ dozens}$$

$$= 12 \times 12 = 144$$

$$\therefore \text{ Number of mangoes in 43 boxes} = 43 \times 144 = 6192$$

26. (d) Required product = $768 \times 859 = 659712$
 27. (b) Requirement of bananas for 1 day in the canteen = 13 dozens
 \therefore Requirement of bananas for 9 weeks i.e. 63 days
 = 63×13 dozens
 = $63 \times 13 \times 12 = 9828$.

28. (e) Let the cost of one chair be ₹ x and that of a table be ₹ y
 According to the question,
 $3x + 10y = ₹9856$
 or, $2 \times (3x + 10y) = 2 \times 9856$
 $\therefore 6x + 20y = ₹19712$

29. (a) Amount received by each person
 $= \frac{123098}{61} = ₹2018$

30. (d) $963 \times 788 = 758844$
 31. (a) Let the number be x

Then $\frac{3x}{5} - \frac{2x}{5} = 250$
 $\Rightarrow x = 250 \times 5 = 1250$

32. (e) Required quantity of rice = $\frac{4560 \times 7}{30}$ kg = 1064 kg

33. (d) amount received by each person
 $= \frac{13957}{45} = ₹310.15 \approx ₹310$

34. (b) Required time
 = L.C.M of 24, 36 and 48
 = 144 seconds
 = 2 minutes 24 seconds

35. (c) $\frac{x + x + 2 + x + 4 + x + 6}{4} = 27$
 $\Rightarrow x = \frac{27 \times 4 - 12}{4} = \frac{96}{4} = 24$
 \therefore Highest number = $24 + 6 = 30$

36. (b) Required time = L.C.M of 24, 36 and 30
 = 360 seconds = 6 minutes

37. (a) The given fractions are $\frac{1}{2}, \frac{2}{3}, \frac{5}{9}, \frac{6}{13}$ and $\frac{7}{9}$
 LCM of their denominators is 234

$$\therefore \frac{117, 78, 26, 18, 26}{234}$$

$$\frac{117, 2 \times 78, 5 \times 26, 6 \times 18, 7 \times 26}{234}$$

$$\frac{117, 156, 130, 108, 182}{234}$$

On arranging the numerators in ascending order
 108, 117, 130, 156, 182.

\therefore Ascending order of the fraction is

$$\frac{6}{13} < \frac{1}{2} < \frac{5}{9} < \frac{2}{3} < \frac{7}{9}$$

38. (a) Decimal equivalents of fractions

$$\frac{7}{8} = 0.875, \frac{4}{5} = 0.8$$

$$\frac{8}{14} = 0.57, \frac{3}{5} = 0.6$$

$$\frac{5}{6} = 0.83$$

$$\therefore 0.875 > 0.83 > 0.8 > 0.6 > 0.57$$

$$\therefore \frac{7}{8} > \frac{5}{6} > \frac{4}{5} > \frac{3}{5} > \frac{8}{14}$$

39. (b) Decimal equivalent of given fractions:

$$\frac{2}{5} = 0.4; \quad \frac{3}{4} = 0.75; \quad \frac{4}{5} = 0.8;$$

$$\frac{5}{7} = 0.714; \quad \frac{6}{11} = 0.545$$

Clearly, $0.4 < 0.545 < 0.714 < 0.75 < 0.8$

$$\therefore \frac{2}{5} < \frac{6}{11} < \frac{5}{7} < \frac{3}{4} < \frac{4}{5}$$

40. (a) Let the larger and smaller numbers be x and y respectively.

Then, $x - y = 3$... (i)

and, $x^2 - y^2 = 63$

$$\Rightarrow (x + y)(x - y) = 63$$

$$\Rightarrow (x + y) = \frac{63}{3} = 21$$
 ... (ii)

From equation (i) and (ii),

$$x = 12$$

41. (a) Let the number be x

According to the question,

$$x - \frac{2x}{5} = 30$$

$$\Rightarrow \frac{3x}{5} = 30$$

$$\Rightarrow x = \frac{30 \times 5}{3} = 50$$

42. (c) Sum to be collected from 54 students = $60 \times 54 = 3240$ ₹
 Sum to be collected from 45 students = 3240

$$\text{Amount contributed by 1 student} = \frac{3240}{45} = 72$$

\therefore Additional amount to be paid by each student

$$72 - 60 = 12$$

43. (d) Let the number be x .

$$\therefore x^2 - (12)^2 = 976$$

$$\therefore x^2 = 976 + 1728 = 2704$$

$$\therefore x = \sqrt{2704} = 52$$

44. (c) \therefore 5 chairs + 8 tables = ₹6574

$$\therefore 10 chairs + 16 tables = $6574 \times 2 = ₹13148$$$

45. (b) Let the number be x .

$$\therefore x^2 + (56)^2 = 4985$$

$$\Rightarrow x^2 = 4985 - 3136 = 1849$$

$$\therefore x = \sqrt{1849} = 43$$

46. (c)
 47. (a) A hen has two legs whereas a cow has four legs.
 But both of them have one head each.
 Let Kishan have x cows
 \therefore Number of hens = $59 - x$.
 According to the question,
 $4 \times x + (59 - x) \times 2 = 190$
 or, $4x + 118 - 2x = 190$
 or, $2x = 190 - 118 = 72$

$$\therefore x = \frac{72}{2} = 36$$

Number of cows = 36

48. (c) Let the number of hens = x
 \therefore Number of goats = $43 - x$
 According to the question,
 $x \times 2 + (43 - x) \times 4 = 142$
 or, $2x + 172 - 4x = 142$
 or, $2x = 172 - 142$

$$\therefore x = \frac{30}{2} = 15$$

\therefore Number of hens = 15

49. (c) Let the two-digit number be
 $= 10x + y$, where $x < y$.
 Number obtained after interchanging the digits
 $= 10y + x$
 According to the question,
 $(10x + y) - (10y + x) = 9$
 or, $9x - 9y = 9$
 or, $x - y = 1$... (i)
 and $x + y = 15$... (ii)

From equations (i) and (ii),
 $x = 8$ and $y = 7$

\therefore Required product = $8 \times 7 = 56$.

50. (a) Let the number be $(10x + y)$
 Then, $(10x + y) - (10y + x) = 18$
 $\Rightarrow 9x - 9y = 18$
 $\Rightarrow x - y = 2$... (i)
 and, $x + y = 16$... (ii)
 $x = 9, y = 7$

From equations (i) and (ii),
 So, the number is $(10 \times 9 + 7) = 97$
 Also from options, it is also evident that $97 - 79 = 18$
 and $9 + 7 = 16$.

51. (e) $\frac{3}{5} = 0.6, \frac{1}{8} = 0.125,$
 $\frac{8}{11} = 0.727, \frac{4}{9} = 0.44,$
 $\frac{2}{7} = 0.285, \frac{5}{7} = 0.714,$

$$\frac{5}{12} = 0.416$$

Descending order :

$$\frac{8}{11}, \frac{5}{7}, \frac{3}{5}, \frac{4}{9}, \frac{5}{12}, \frac{2}{7}, \frac{1}{8}$$

So, $\frac{3}{5}$ is the third.

52. (c) Let Farah's age at the time of her marriage be x .

$$\text{Then, } (x + 8) = x \times \frac{9}{7}$$

$$\Rightarrow \frac{9x}{7} - x = 8$$

$$\Rightarrow x = \frac{8 \times 7}{2} = 28 \text{ years}$$

\therefore Farah's present age = $28 + 8 = 36$ years

\therefore Daughter's age 3 years ago = $36 \times \frac{1}{6} - 3$
 $= 3$ years

53. (d) $A + C = 146$
 or $A + A + 4 = 146$

$$\text{or } A = \frac{146 - 4}{2} = 71$$

$$\therefore E = A + 8 = 71 + 8 = 79$$

54. (b) Let Seema's present age be x years.

Then, Seema's son's present age = $\frac{x}{4}$ years

Seema's father's present age = $\frac{7x}{4}$ years.

$$\text{Then, } x + \frac{x}{4} + \frac{7x}{4} = 32 \times 3$$

$$\Rightarrow 12x = 96 \times 4$$

$$\Rightarrow x = \frac{96 \times 4}{12} = 32$$

\therefore Required difference = $\frac{7 \times 32}{4} - \frac{32}{4}$
 $= 56 - 8 = 48$ years

55. (d) Lowest number of set A = $\frac{280}{5} - 4 = 52$

Lowest number of other set = $52 \times 2 - 71 = 33$
 \therefore Required sum = $33 + 34 + 35 + 36 + 37 = 175$

56. (c) Let total number of goats be x .
 Then, total number of hens = $(90 - x)$
 So, $x \times 4 + (90 - x) \times 2 = 248$
 $\Rightarrow 4x - 2x = 248 - 180$

$$x = \frac{68}{2} = 34$$

57. (d) Let the two numbers be x and $(x + 2)$.

$$\text{Then, } x^2 + (x + 2)^2 = 6500$$

$$\Rightarrow x^2 + x^2 + 4x + 4 = 6500$$

$$\Rightarrow 2x^2 + 4x - 6496 = 0$$

$$\Rightarrow x^2 + 2x - 3248 = 0$$

$$\Rightarrow x^2 + 58x - 56x - 3248 = 0$$

$$\Rightarrow (x + 58)(x - 56) = 0$$

$$\Rightarrow x = 56$$

Again, using options, it is clear that $(56)^2 + (58)^2 = 6500$



SIMPLIFICATION

CHAPTER

2

SIMPLIFICATION

Algebraic expressions contain alphabetic symbols as well as numbers. When an algebraic expression is simplified, an equivalent expression is found that is simpler than the original. This usually means that the simplified expression is smaller than the original.

BODMAS RULE :

This rule depicts the correct sequence in which the operations are to be executed, so as to find out the value of a given expression. Here, 'B' stands for 'Bracket', 'O' for 'of', 'D' for 'Division', 'M' for 'Multiplication', 'A' for 'Addition', 'S' for 'Subtraction'.

When an expression contains a vinculum (a horizontal line above an expression), before applying the 'BODMAS' rule, we simplify the expression under the vinculum.

The next step is to evaluate all the expressions in the brackets.

After removing the brackets, we must use the following operations strictly in the following order:

1. of
2. Division, Multiplication
3. Addition, Subtraction

So, the order of precedence is:

- V Vinculum first
- B Brackets [{}]
- O Of, Orders (i.e. Powers and Square Roots, etc.)
- DM Division and Multiplication (left-to-right)
- AS Addition and Subtraction (left-to-right)

SURDS AND INDICES

TYPES OF SURDS :

Mixed surds: If one factor of a surd is a rational number and the other factor is an irrational number, then the surd is called a mixed surd.

Example: $2\sqrt{5}$, $-2\sqrt{3}$

Pure surds: If a surd has unity as its only rational factor, the other factor being an irrational number, then it is called a pure surd.

Examples: $\sqrt{3}$, \sqrt{a}

Since surds are irrational numbers, they can be added or subtracted

as real numbers. Also a rational number can be added or subtracted from a surd. The result will be a real number.

Examples: $\sqrt{5} + 3$; $2 - \sqrt{7}$; $\sqrt{3} - 2$

ADDITION AND SUBTRACTION OF SURDS :

Example: $5\sqrt{2} + 20\sqrt{2} - 3\sqrt{2} = 22\sqrt{2}$

Example: $\sqrt{45} - 3\sqrt{20} + 4\sqrt{5} = \sqrt{5}$

Multiplying and Dividing Surds :

Surds can be multiplied by using the laws of surds. To multiply or divide Surds they have to first be made of the same order.

Examples: $\sqrt{4} \times \sqrt{22} = \sqrt{88}$, $\sqrt{162} \div \sqrt{18} = 3\sqrt{2}$ / $\sqrt{9} = 3\sqrt{2}$

LAWS OF INDICES :

$$\diamond a^m \times a^n = a^{m+n}$$

$$\diamond a^m \div a^n = a^{m-n}$$

$$\diamond (a^m)^n = a^{mn}$$

$$\diamond \frac{1}{a^m} = \frac{1}{a^m}$$

$$\diamond a^{-m} = \frac{1}{a^m}$$

$$\diamond a^{m/n} = \sqrt[n]{a^m}$$

$$\diamond a^0 = 1$$

$$\text{Also, } \left(\frac{1}{a^n} \right)^n = a$$

$$\frac{1}{a^n} \cdot \frac{1}{b^n} = \frac{1}{(ab)^n}$$

$$\left(\frac{1}{a^n} \right)^m = \frac{1}{a^{nm}}$$

Examples:

$$\sqrt[5]{4^3} = (4^3)^{\frac{1}{5}} = (4^{\frac{3}{5}})$$

$$5^3 \times 5^4 = 5^7$$

$$\frac{5^5}{5^2} = 5^3$$

Basic Formulas helpful in simplification

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(a^2 - b^2) = (a - b)(a + b)$$

$$(a + b)^2 = (a - b)^2 + 4ab$$

$$(a - b)^2 = (a + b)^2 - 4ab$$

$$(a - b)^3 = a^3 - b^3 - 3ab(a - b)$$

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$$

$$x^3 + \frac{1}{x^3} = \left(x + \frac{1}{x}\right)^3 - 3\left(x + \frac{1}{x}\right)$$

$$\text{If } a + b + c = 0, \text{ then } a^3 + b^3 + c^3 = 3abc$$

$$(a - b)^2 = a^2 - 2ab + b^2$$

$$(a + b)^2 + (a - b)^2 = 2(a^2 + b^2)$$

$$(a + b)^3 = a^3 + b^3 + 3ab(a + b)$$

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ac)$$

$$x^2 + \frac{1}{x^2} = \left(x + \frac{1}{x}\right)^2 - 2 = \left(x - \frac{1}{x}\right)^2 + 2$$

SOLVED EXAMPLES

EXAMPLE 1: What value should come in place of the question mark (?) in the following question ?

$$432 \times 66 - 1562 = ?$$

- (a) 23450 (b) 24360
(c) 25890 (d) 26950
(e) None of these

Sol. (d) $? = 432 \times 66 - 1562$
 $= 28512 - 1562 = 26950$

EXAMPLE 2: What value should come in place of the question mark (?) in the following question ?

$$44^3 \times 16^3 - 18678^2 = ?$$

- (a) 45980 (b) 44890
(c) 43780 (d) 42670
(e) None of these

Sol. (a) $? = 44^3 \times 16^3 - 18678^2$
 $= 348913664 - 348867684$
 $= 45980$

EXAMPLE 3: What value should come in place of the question mark (?) in the following question ?

$$6\frac{2}{3} \div 4\frac{4}{5} = ?$$

- (a) $1\frac{1}{3}$ (b) $1\frac{7}{18}$
(c) $1\frac{12}{19}$ (d) $1\frac{5}{8}$
(e) None of these

Sol. (b) $? = \frac{20}{3} \div \frac{24}{5}$
 $= \frac{20}{3} \times \frac{5}{24} = \frac{25}{18} = 1\frac{7}{18}$

EXAMPLE 4: What value should come in place of the question mark (?) in the following question ?

$$\frac{3}{8} \text{ of } \frac{5}{7} \text{ of } \frac{2}{5} \text{ of } 1680 = ?$$

- (a) 150 (b) 180
(c) 210 (d) 240
(e) None of these

Sol. (b) $? = 1680 \times \frac{2}{5} \times \frac{5}{7} \times \frac{3}{8} = 180$

EXAMPLE 5: If $(28)^3$ is subtracted from the square of a number, the answer so obtained is 1457. What is the number?

- (a) 127 (b) 136
(c) 142 (d) 153
(e) None of these

Sol. (d) Let the number be x .

According to the question,

$$x^2 - (28)^3 = 1457$$

$$\Rightarrow x^2 - 21952 = 1457$$

$$\Rightarrow x^2 - 21952 - 1457 = 0$$

$$\Rightarrow x^2 = 23409$$

$$\Rightarrow x = \sqrt{23409} = 153$$

EXAMPLE 6: If $(89)^2$ is added to the square of a number, the answer so obtained is 16202. What is the number?

- (a) 91 (b) 8281
(c) 8649 (d) 93
(e) None of these

Sol. (a) Let the number be x .

According to the question,

$$x^2 + (89)^2 = 16202$$

9. $18 \times ? = 7776 \div 12$
 (a) 32 (b) 42
 (c) 160 (d) 36
 (e) None of these
10. $11 \times 55 \div 5 + 9 = ?$
 (a) 120 (b) 140
 (c) 48 (d) 180
 (e) None of these
11. $85333 - 11638 - 60994 = ?$
 (a) 12701 (b) 12600
 (c) 12800 (d) 12500
 (e) None of these
12. $8^4 - 8^2 = ?$
 (a) 64 (b) 512
 (c) 4032 (d) 4096
 (e) None of these
13. $6.3 \times 12.8 \times 9.9 - 69.996 = ?$
 (a) 738.54 (b) 758.94
 (c) 728.34 (d) 748.74
 (e) None of these
14. $8 + 18 \times 368 \div 16 = ?$
 (a) 598 (b) 356
 (c) 648 (d) 422
 (e) None of these
15. $11059 + 8889 - 908 = ? \times 85$
 (a) 236 (b) 212
 (c) 248 (d) 272
 (e) None of these
16. $66606 + 40998 = ? - 24848$
 (a) 132452 (b) 132242
 (c) 132425 (d) 132254
 (e) None of these
17. $894.65 - 388.24 + 100.99 = ?$
 (a) 617.4 (b) 607.4
 (c) 597.4 (d) 587.4
 (e) None of these
18. $1181 + 1520 = (26)^2 + (?)^2$
 (a) 49 (b) 43
 (c) 47 (d) 45
 (e) None of these
19. $59475 \div \sqrt{?} = 195 \times 5$
 (a) 3969 (b) 3481
 (c) 4225 (d) 3249
 (e) None of these
20. $\sqrt{?} + 29 = \sqrt{2704}$
 (a) 23 (b) 529
 (c) 441 (d) 21
 (e) None of these
21. What is the least number to be added to 1500 to make it a perfect square?
 (a) 21 (b) 35
 (c) 43 (d) 59
 (e) None of these
22. $-\frac{4}{5}$ of 1150 + $\frac{5}{6}$ of 1248 = ?
 (a) 140 (b) 115
 (c) 125 (d) 120
 (e) None of these
23. $235 + 75 \times 8 = ?$
 (a) 2480 (b) 835
 (c) 1955 (d) 2840
 (e) none of these
24. $5986 - 2340 = 1496 + ?$
 (a) 2150 (b) 1150
 (c) 2140 (d) 1970
 (e) none of these
25. $\frac{1}{74} \times (343)^{0.25} = ?$
 (a) $\sqrt{7}$ (b) 49
 (c) 7 (d) $7\sqrt{7}$
 (e) None of these
26. $57.63 - 37.26 = 39.27 - ?$
 (a) 18.90 (b) 18.54
 (c) 19.73 (d) 19.54
 (e) None of these
27. $\sqrt{1089} + \sqrt{289} = \sqrt{?}$
 (a) 625 (b) 50
 (c) 25 (d) 1378
 (e) None of these
28. $12.8 \times 2.5 + 8.6 = ?$
 (a) 41.3 (b) 39.6
 (c) 40.6 (d) 142.08
 (e) None of these
29. $(14^2 - 13^2) \div 3 = ?^2$
 (a) 9 (b) 3
 (c) 27 (d) 6
 (e) None of these
30. $(19)^{12} \times (19)^8 \div (19)^4 = (19)^?$
 (a) 24 (b) 8
 (c) 6 (d) 12
 (e) None of these
31. $70.56 \div 11.2 = ?$
 (a) 63 (b) 6.3
 (c) 7.72 (d) 0.53
 (e) None of these

32. If $x + y = 23$ and $xy = 126$; then $(x)^2 + (y)^2 = ?$
 (a) 250 (b) 317
 (c) 340 (d) Cannot be determined
 (e) None of these
33. $986.23 + 7.952 + 8176.158 = ?$
 (a) 9170.340 (b) 9169.230
 (c) 9241.908 (d) 9170.762
 (e) None of these
34. $\sqrt{1296} \div \sqrt{36} = ?$
 (a) 1 (b) 36
 (c) 6 (d) 18
 (e) None of these
35. $112 \div 7 \div 4 = 8 \times ?$
 (a) 0.25 (b) 0.05
 (c) 0.5 (d) 8
 (e) None of these
36. $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{4}{8}$ of 3750 = ?
 (a) 625 (b) 312.5
 (c) 125 (d) 250
 (e) None of these
37. $\frac{3 \times 8 + 4}{9 \times 15 - 9} = ?$
 (a) $\frac{16}{9}$ (b) $\frac{2}{3}$
 (c) $\frac{4}{9}$ (d) $\frac{3}{2}$
 (e) None of these
38. $(87324 - 79576) \times 1.5 = ?$
 (a) 1162.2 (b) 11622
 (c) 1372.2 (d) 1163.7
 (e) None of these
39. $(331 + 19) \times (15 - 11) \times (37 + 13) = ?$
 (a) 70000 (b) 4131
 (c) 30250 (d) 20350
 (e) None of these
40. $11.88 \times \frac{250}{18} = ?$
 (a) 16.50 (b) 4131
 (c) 30250 (d) 20350
 (e) None of these
41. $\frac{1}{2} \times \frac{3}{4} \div \left(\frac{9}{2} \times \frac{5}{8} \right) = ?$
 (a) $\frac{5}{96}$ (b) $\frac{15}{8}$
 (c) $\frac{5}{108}$ (d) $\frac{12}{5}$
 (e) None of these
42. $\frac{18 + 17 \times 3 - 1}{8 - 15 \div 3 - 1} = ?$
 (a) 17 (b) 26
 (c) 13 (d) 34
 (e) None of these
43. $1\frac{1}{2} + 1\frac{2}{3} \div \left(\frac{6}{7} - \frac{5}{6} \right) = ?$
 (a) 71.5 (b) 133
 (c) $\frac{19}{252}$ (d) $\frac{19}{180}$
 (e) None of these
44. $\sqrt{?} - 63 = 9^2$
 (a) 12 (b) 144
 (c) 324 (d) 128
 (e) None of these
45. $916.28 - 72.4 = 728.2 + ?$
 (a) 115.86 (b) 125.68
 (c) 215.68 (d) 216.04
 (e) None of these
46. $7776 \div 18 \times 3 = ?$
 (a) 144 (b) 1926
 (c) 1296 (d) 1266
 (e) None of these
47. $8994 - 4178 - 2094 = ?$
 (a) 2720 (b) 2726
 (c) 2730 (d) 2734
 (e) None of these
48. $315 \times 114 - 1565 = ?$
 (a) 34534 (b) 34435
 (c) 34345 (d) 33445
 (e) None of these
49. $1256 \div (32 \times 0.25) = ?$
 (a) 160 (b) 154
 (c) 165 (d) 157
 (e) None of these
50. $69.2 \times 18.4 \times 4.5 = ?$
 (a) 5729.76 (b) 5972.76
 (c) 5279.76 (d) 5792.76
 (e) None of these

51. $3.2 \times 6.8 \times 9.5 = ?$
 (a) 207.62 (b) 202.67
 (c) 206.27 (d) 207.72
 (e) None of these
52. $15^3 \times 9^3 - 1555^2 = ?$
 (a) 41250 (b) 43250
 (c) 42350 (d) 44250
 (e) None of these
53. $8\frac{2}{5} \div 10\frac{2}{25} = ?$
 (a) $\frac{5}{6}$ (b) $\frac{7}{8}$
 (c) $\frac{4}{5}$ (d) $\frac{3}{4}$
 (e) None of these
54. $\frac{3}{5}$ of $\frac{3}{4}$ of $\frac{5}{6}$ of 992 = ?
 (a) 388 (b) 390
 (c) 372 (d) 376
 (e) None of these
55. $\sqrt{?} + 17 = \sqrt{961}$
 (a) 169 (b) 256
 (c) 225 (d) 196
 (e) None of these
56. $123 \div 6 \div 0.8 = ?$
 (a) 25.625 (b) 23.545
 (c) 27.455 (d) 21.365
 (e) None of these
- Choose the correct option.**
57. What is the least number to be added to 3986 to make it a perfect square ?
 (a) 118 (b) 95
 (c) 110 (d) 100
 (e) None of these
58. $\sqrt{3781} \times 5.36 \approx ?$
 (a) 350 (b) 330
 (c) 240 (d) 280
 (e) 410
59. If $(26)^2$ is subtracted from square of a number, the answer so obtained is 549. What is the number?
 (a) 35 (b) 33
 (c) 29 (d) 41
 (e) None of these
60. $[(4)^3 \times (5)^4] \div (4)^5 = ?$
 (a) 30.0925 (b) 39.0625
 (c) 35.6015 (d) 29.0825
 (e) None of these
61. $\frac{1.6 \times 3.2}{0.08} = ?$
 (a) 6.4 (b) 8
 (c) 64 (d) 0.8
 (e) None of these
62. $(7857 + 3596 + 4123) \div 96 = ?$
 (a) 155.06 (b) 162.25
 (c) 151.83 (d) 165.70
 (e) None of these
63. $5321 \div 305 \times (19)^2 \approx ?$
 (a) 6150 (b) 6425
 (c) 6380 (d) 6355
 (e) 6300
64. If $(61)^2$ is added to the square of a number, the answer so obtained is 5242. What is the number?
 (a) 40 (b) 39
 (c) 37 (d) 43
 (e) None of these
65. What is the least number to be added to 4400 to make it a perfect square?
 (a) 87 (b) 91
 (c) 93 (d) 89
 (e) None of these
66. The difference between two numbers is 3 and the difference of their squares is 63. Find the greater number.
 (a) 12 (b) 9
 (c) 15 (d) Cannot be determined
 (e) None of these
67. How much less is $\frac{4}{5}$ of 1150 from $\frac{5}{6}$ of 1248 ?
 (a) 140 (b) 115
 (c) 125 (d) 120
 (e) None of these
68. If $(74)^2$ is subtracted from the square of a number, the answer so obtained is 5340. What is the number?
 (a) 98 (b) 102
 (c) 104 (d) 110
 (e) None of these
69. If $2x + 3y = 78$ and $3x + 2y = 72$, what is the value of $x + y$?
 (a) 36 (b) 32
 (c) 30 (d) Cannot be determined
 (e) None of these
70. $741560 + 935416 + 1143 + 17364 = ?$
 (a) 1694583 (b) 1695438
 (c) 1695483 (d) 1659483
 (e) None of these

71. $(84)^2 \div \sqrt{7} = 168$
 (a) 1936 (b) 1521
 (c) 1681 (d) 1764
 (e) None of these
72. $514789 - 317463 - 87695 - 11207 = ?$
 (a) 96584 (b) 98242
 (c) 96845 (d) 98424
 (e) None of these
73. $\sqrt[3]{50653} = ?$
 (a) 39 (b) 43
 (c) 33 (d) 41
 (e) None of these
74. $(17891 + 16239 - 26352) \times ? = 93336$
 (a) 12 (b) 15
 (c) 18 (d) 8
 (e) None of these
75. $\frac{1}{4} \times 6624 \times \frac{1}{6} \times 12 = ?$
 (a) 3312 (b) 3864
 (c) 2208 (d) 4416
 (e) None of these
76. $\frac{18 \times 15 - 50}{(40 \times 80) \div 160} = ?$
 (a) 20 (b) 8.5
 (c) 11.5 (d) 22
 (e) None of these
77. $\sqrt{?} \times \sqrt{1681} = 2296$
 (a) 2196 (b) 3364
 (c) 2809 (d) 3025
 (e) None of these
78. If $(74)^2$ is subtracted from the square of a number, the answer so obtained is 3740. What is the number?
 (a) 9216 (b) 98
 (c) 9604 (d) 96
 (e) None of these
79. $93 \times 45 \div 25 = ?$
 (a) 167.4 (b) 837
 (c) 279 (d) 130.2
 (e) None of these
80. $0.08 \times ? \times 1.6 = 0.2944$
 (a) 1.3 (b) 0.4
 (c) 0.2 (d) 2.3
 (e) None of these
81. $6 \times 66 \times 666 = ?$
 (a) 263736 (b) 267336
 (c) 263763 (d) 263376
 (e) None of these
82. $5\frac{1}{7} \times 8\frac{1}{6} \div 7\frac{7}{8} = ?$
 (a) $1\frac{7}{9}$ (b) $1\frac{7}{8}$
 (c) $5\frac{1}{3}$ (d) $5\frac{2}{3}$
 (e) None of these
83. $(7)^3 \div \sqrt{7} + 7 = 14$
 (a) 49 (b) 1764
 (c) 441 (d) 3136
 (e) None of these
84. $\sqrt[3]{12167} \times ? = 1035$
 (a) 35 (b) 25
 (c) 55 (d) 15
 (e) None of these
85. $1256 \times 3892 = ?$
 (a) 4883582 (b) 4888352
 (c) 4888532 (d) 4883852
 (e) None of these
86. $0.08 \times 0.5 + 0.9 = ?$
 (a) 1.3 (b) 0.94
 (c) 0.12 (d) 1.5
 (e) None of these
87. $8195 \div 745 + ? \times 12 = 7847$
 (a) 648 (b) 593
 (c) 601 (d) 653
 (e) None of these
88. $4123 \div (2.3)^2 - 446 = ?$
 (a) 401 (b) 441
 (c) 301 (d) 333
 (e) 386
89. If $x + y = 18$ and $xy = 72$, what is the value of $(x)^2 + (y)^2$?
 (a) 120 (b) 90
 (c) 180 (d) Cannot be determined
 (e) None of these
90. Which least number should be added to 8115 to make it a perfect square?
 (a) 349 (b) 166
 (c) 144 (d) 194
 (e) None of these
91. If $(46)^2$ is subtracted from the square of a number, the answer so obtained is 485. What is the number?
 (a) 4 (b) 51
 (c) 56 (d) 53
 (e) None of these

92. $666 \div (2.4 \times ?) = 185$
 (a) 1.5 (b) 2.5
 (c) 0.5 (d) 5
 (e) None of these
93. $956 \times 753 = ?$
 (a) 723692 (b) 727398
 (c) 710308 (d) 719868
 (e) None of these
94. $\frac{3}{8} \times \frac{4}{7} \times ? = 5376$
 (a) 30912 (b) 25144
 (c) 24808 (d) 25088
 (e) None of these
95. $[(9)^3 \times (?)^2] \div 21 = 1701$
 (a) 6 (b) 3
 (c) 11 (d) 4
 (e) None of these
96. $897214 - 336 - 46521 - 1249 - 632176 = ?$
 (a) 217832 (b) 216725
 (c) 216932 (d) 315950
 (e) None of these
97. $\sqrt{11881} \times \sqrt{?} = 10137$
 (a) 8649 (b) 9216
 (c) 8281 (d) 9409
 (e) None of these
98. $3.5 \times 2.4 \times ? = 42$
 (a) 1.5 (b) 0.2
 (c) 0.8 (d) 1.2
 (e) None of these
99. $\sqrt[3]{804357} = ?$
 (a) 98 (b) 89
 (c) 96 (d) 93
 (e) None of these
100. $\sqrt{?} \div 16 \times 24 = 186$
 (a) 14884 (b) 13924
 (c) 15376 (d) 15876
 (e) None of these
101. $(?)^2 \div (0.04)^2 \times 5.6 = 117740$
 (a) 33.64 (b) 6.2
 (c) 38.44 (d) 5.4
 (e) None of these
102. $9418 - ? + 1436 + 2156 = 5658$
 (a) 7523 (b) 7352
 (c) 7232 (d) 7325
 (e) None of these
103. $9865 + ? + 3174 + 2257 = 19425$
 (a) 4047 (b) 4136
 (c) 4129 (d) 4092
 (e) None of these
104. $\frac{9}{?} \times 33824 = 63$
 (a) 4228 (b) 4832
 (c) 2416 (d) 8456
 (e) None of these
105. $(99)^2 - (?)^2 + (38)^2 = 8436$
 (a) 57 (b) 53
 (c) 49 (d) 61
 (e) None of these
106. $12.36 \times 18.15 + 21.52 = ?$
 (a) 250.3036 (b) 209.1448
 (c) 249.454 (d) 245.854
 (e) None of these
107. $(98764 + 89881 + 99763 + 66342) \div$
 $(1186 + ? + 1040 + 1870) = 55$
 (a) 2354 (b) 2368
 (c) 2254 (d) 2404
 (e) None of these
108. $(64)^2 \div \sqrt[3]{32768} = ?$
 (a) 128 (b) 132
 (c) 142 (d) 104
 (e) None of these
109. $\frac{21 \times 14 - 34}{12.4 + 5.6 - 15.5} = ?$
 (a) 95 (b) 100
 (c) 110 (d) 106
 (e) None of these
110. $0.09 \times 6.8 \times ? = 2.142$
 (a) 2.5 (b) 4.4
 (c) 3.5 (d) 2.4
 (e) None of these
111. $11\frac{1}{7} + 2\frac{5}{8} = ?$
 (a) $110\frac{1}{7}$ (b) $13\frac{45}{56}$
 (c) $96\frac{3}{8}$ (d) $13\frac{43}{56}$
 (e) None of these
112. $894 \div 28 \times \sqrt{589} \approx ?$
 (a) 700 (b) 686
 (c) 796 (d) 775
 (e) 754
113. If $(57)^2$ is added to the square of a number, the answer so obtained is 8010. What is the number?
 (a) 61 (b) 63
 (c) 67 (d) 59
 (e) None of these

114. $7275.84 - 889.4 + 124.518 = ?$
 (a) 6550.202 (b) 6560.598
 (c) 6550.958 (d) 6510.958
 (e) None of these
115. $\frac{12^2 - 4^2}{9^2 - 3^2} = ?$
 (a) $1\frac{7}{9}$ (b) $1\frac{8}{9}$
 (c) $1\frac{1}{3}$ (d) 9
 (e) None of these
116. $18800 \div 470 \div 20 = ?$
 (a) 800 (b) 2
 (c) 23.5 (d) 0.10
 (e) None of these
117. $\sqrt{?} + 136 = 320$ of $\frac{5}{8}$
 (a) 1936 (b) 4624
 (c) 4196 (d) 4096
 (e) None of these
118. $777.07 + 77.77 + 0.77 + 7.07 + 7 + 77 = ?$
 (a) 946.78 (b) 946.68
 (c) 964.68 (d) 946.86
 (e) None of these
119. $0.4 \times ? = 0.000016$
 (a) 4 (b) 0.04
 (c) 0.0004 (d) 400
 (e) None of these
120. $4^7 \div 16^4 \times \sqrt{16} = ?$
 (a) $\frac{1}{16}$ (b) $\frac{1}{4}$
 (c) 4 (d) 1
 (e) None of these
121. $0.99 \times 1000 \times 14 \div 11 \div 0.7 = ?$
 (a) 18 (b) 180
 (c) 1.8 (d) 1800
 (e) None of these
122. $95^{3.7} \div 95^{0.9989} \approx 95^?$
 (a) 1.9 (b) 3
 (c) 2.99 (d) 3.6
 (e) 2.7
123. $\sqrt{10000} + 1891.992$ of $\frac{3.001}{4.987} \approx ?$
 (a) 2500 (b) 1230
 (c) 1640 (d) 1525
 (e) 2130
124. $0.0004 \div 0.0001 \times 36.000009 \approx ?$
 (a) 0.10 (b) 1.45
 (c) 145 (d) 14.5
 (e) 1450
125. $3739 + 164 \times 27 \approx ?$
 (a) 1054000 (b) 4000
 (c) 8200 (d) 690
 (e) 6300
126. $9876 \div 24.96 + 215.005 - ? \approx 309.99$
 (a) 395 (b) 395
 (c) 300 (d) 315
 (e) 310
127. $[(135)^2 \div 15 \times 32] \div ? = 45 \times 24$
 (a) 18 (b) 24
 (c) 36 (d) 44
 (e) None of these
128. $(96)^2 + (63)^2 - (2)^2 - (111)^2 - 8350$
 (a) 33856 (b) 30276
 (c) 174 (d) 184
 (e) None of these
129. $4368 + 2158 - 596 - ? = 3421 + 1262$
 (a) 1066 (b) 1174
 (c) 1247 (d) 1387
 (e) None of these
130. $2172 \div ? = 1832 - 956 - 514$
 (a) 6 (b) 8
 (c) 10 (d) 12
 (e) None of these
131. $666.06 + 66.60 + 0.66 + 6.06 + 6 + 60 = ?$
 (a) 819.56 (b) 805.38
 (c) 826.44 (d) 798.62
 (e) None of these
132. $205 \times ? \times 13 = 33625 + 25005$
 (a) 22 (b) 27
 (c) 33 (d) 39
 (e) None of these
133. $(10)^{24} \times (10)^{-21} = ?$
 (a) 3 (b) 10
 (c) 100 (d) 1000
 (e) None of these
134. What is the least number to be added to 4321 to make it a perfect square?
 (a) 32 (b) 34
 (c) 36 (d) 38
 (e) None of these
135. $628.306 + 6.1325 \times 44.0268 \approx ?$
 (a) 820 (b) 970
 (c) 1050 (d) 1175
 (e) 900

136. $1896 \div 29 + 445 \approx ?$
 (a) 485 (b) 510
 (c) 528 (d) 493
 (e) 536
137. $(9795 + 7621 + 938) \div (541 + 831 + 496) \approx ?$
 (a) 9 (b) 13
 (c) 17 (d) 23
 (e) 29
138. $814296 \times 36 \approx ? \times 96324$
 (a) 326 (b) 272
 (c) 304 (d) 358
 (e) 260
139. $78 \div 5 \div 0.5 = ?$
 (a) 15.6 (b) 31.2
 (c) 7.8 (d) 0.4
 (e) None of these
140. $12.22 + 22.21 + 221.12 = ?$
 (a) 250.55 (b) 255.50
 (c) 250.05 (d) 255.05
 (e) None of these
141. $12^4 \times 12^{13} = ?$
 (a) 12^7 (b) 12^{39}
 (c) 12^{17} (d) 12^{-7}
 (e) None of these
142. $464 \div (16 \times 2.32) = ?$
 (a) 12.5 (b) 14.5
 (c) 10.5 (d) 8.5
 (e) None of these
143. If $(9)^3$ is subtracted from the square of a number, the answer so obtained is 567. What is the number?
 (a) 36 (b) 28
 (c) 42 (d) 48
 (e) None of these
144. If $(78)^2$ is subtracted from the square of a number, the answer so obtained is 6,460. What is the number?
 (a) 109 (b) 111
 (c) 113 (d) 115
 (e) None of these
145. $4275 \div 496 \times (21)^2 \approx ?$
 (a) 3795 (b) 3800
 (c) 3810 (d) 3875
 (e) 3995
146. $14^{13} \times 14^3 = ?$
 (a) 14^{39} (b) 14^7
 (c) 14^{16} (d) 14^{10}
 (e) None of these
147. What is the least number to be added to 4700 to make it a perfect square?
 (a) 74 (b) 69
 (c) 76 (d) 61
 (e) None of these
148. $21.25 + 22.52 \times 212.22 = ?$
 (a) 256.99 (b) 245.99
 (c) 252.99 (d) 258.99
 (e) None of these
149. $\frac{3}{5}$ of $\frac{3}{4}$ of $\frac{5}{6}$ of 992 = ?
 (a) 388 (b) 390
 (c) 372 (d) 376
 (e) None of these
150. $6.4 \times ? = 361.6$
 (a) 63.5 (b) 52.5
 (c) 66.5 (d) 56.5
 (e) None of these
151. $2412 + 1139 + 5498 = ?$
 (a) 8949 (b) 9049
 (c) 8749 (d) 9249
 (e) None of these
152. $3.2 \times 6.8 \times 9.5 = ?$
 (a) 207.62 (b) 202.67
 (c) 206.27 (d) 207.72
 (e) None of these
153. $8994 - 4178 - 2094 = ?$
 (a) 2720 (b) 2726
 (c) 2730 (d) 2734
 (e) None of these
154. $\sqrt{?} + 17 = \sqrt{961}$
 (a) 169 (b) 256
 (c) 225 (d) 196
 (e) None of these
155. $9441 + 3991 - 606 = ? \times 53$
 (a) 236 (b) 238
 (c) 230 (d) 234
 (e) None of these
156. $1719 \div 18 = ?$
 (a) 95.5 (b) 96
 (c) 97.5 (d) 99
 (e) None of these
157. $58369 + 69521 = ? + 31972$
 (a) 95998 (b) 95189
 (c) 95918 (d) 95981
 (e) None of these

158. $5470 \div 378 \times (19)^2 \approx ?$
(a) 5236 (b) 5265
(c) 5204 (d) 5250
(e) None of these
159. What is the least number to be added to 3986 to make it a perfect square?
(a) 188 (b) 95
(c) 110 (d) 100
(e) 5224
160. $832.456 - 539.982 - 123.321 = ?$
(a) 196.153 (b) 149.153
(c) 169.153 (d) 176.135
(e) None of these
161. $236.69 + 356.74 = 393.39 + ?$
(a) 200.04 (b) 201.04
(c) 200.14 (d) 202.14
(e) 203.04
162. $\frac{35 \times 15 \times 10}{25 \times 2} = ?$
(a) 105 (b) 115
(c) 70 (d) 35
(e) None of these
163. $859.05 + 427.89 + 663.17 = ?$
(a) 1585.91 (b) 1286.94
(c) 1950.02 (d) 1950.11
(e) 1951.01
164. $7 \times ? = 29.05$
(a) 4.05 (b) 4.15
(c) 3.95 (d) 4.25
(e) None of these
165. $\frac{558 \times 45}{18 \times 4.5} = ?$
(a) 314 (b) 313
(c) 312 (d) 311
(e) None of these
166. $559 + 965 = ? \times 16$
(a) 92.05 (b) 95.25
(c) 93.15 (d) 94.35
(e) None of these
167. $7\frac{3}{4} + 5\frac{1}{4} + 8\frac{1}{2} = ?$
(a) $20\frac{1}{4}$ (b) $21\frac{1}{2}$
(c) $21\frac{3}{4}$ (d) $21\frac{3}{4}$
(e) $20\frac{3}{4}$
168. $9.1 \times 7.5 \times 6.2 = ?$
(a) 423.15 (b) 68.25
(c) 593.775 (d) 472.5
(e) None of these
169. $49 + \sqrt{?} = 87$
(a) 1444 (b) 1442
(c) 1448 (d) 1456
(e) 1460
170. $\sqrt{?} - 17 = 22$
(a) 1511 (b) 1531
(c) 1515 (d) 1553
(e) 1521
171. $5989 \div 48 \times 11 \approx ?$
(a) 1375 (b) 1370
(c) 1372 (d) 1368
(e) 1365
172. If $3x + 5y = 44$ and $10x - 2y = 16$, what is the value of x?
(a) 7 (b) 3
(c) 5.5 (d) 6.5
(e) None of these
173. If $x + y = 20$ and $xy = 84$, then $(x)^2 + (y)^2 = ?$
(a) 232 (b) 400
(c) 128 (d) Cannot be determined
(e) None of these
174. $\sqrt{876} \times 20.6 + 165.34 \approx ?$
(a) 700 (b) 686
(c) 775 (d) 846
(e) 745

ANSWER KEY

1	(e)	36	(a)	71	(d)	106	(d)	141	(c)
2	(c)	37	(e)	72	(d)	107	(a)	142	(a)
3	(e)	38	(b)	73	(e)	108	(a)	143	(a)
4	(a)	39	(a)	74	(a)	109	(e)	144	(e)
5	(a)	40	(e)	75	(a)	110	(c)	145	(b)
6	(d)	41	(e)	76	(e)	111	(d)	146	(c)
7	(d)	42	(d)	77	(e)	112	(d)	147	(d)
8	(a)	43	(a)	78	(d)	113	(e)	148	(e)
9	(d)	44	(e)	79	(a)	114	(d)	149	(c)
10	(e)	45	(e)	80	(d)	115	(a)	150	(d)
11	(a)	46	(c)	81	(a)	116	(b)	151	(b)
12	(c)	47	(e)	82	(c)	117	(d)	152	(e)
13	(c)	48	(c)	83	(e)	118	(b)	153	(e)
14	(d)	49	(d)	84	(e)	119	(c)	154	(d)
15	(e)	50	(a)	85	(b)	120	(d)	155	(e)
16	(a)	51	(e)	86	(b)	121	(d)	156	(a)
17	(b)	52	(c)	87	(d)	122	(e)	157	(c)
18	(d)	53	(a)	88	(d)	123	(b)	158	(e)
19	(e)	54	(c)	89	(c)	124	(c)	159	(c)
20	(b)	55	(d)	90	(b)	125	(c)	160	(c)
21	(a)	56	(a)	91	(b)	126	(c)	161	(a)
22	(d)	57	(c)	92	(a)	127	(c)	162	(a)
23	(b)	58	(b)	93	(d)	128	(d)	163	(d)
24	(a)	59	(a)	94	(d)	129	(c)	164	(b)
25	(c)	60	(b)	95	(e)	130	(a)	165	(e)
26	(a)	61	(c)	96	(c)	131	(b)	166	(b)
27	(e)	62	(b)	97	(a)	132	(a)	167	(b)
28	(c)	63	(e)	98	(e)	133	(d)	168	(a)
29	(b)	64	(b)	99	(d)	134	(e)	169	(a)
30	(e)	65	(d)	100	(c)	135	(e)	170	(e)
31	(b)	66	(a)	101	(e)	136	(b)	171	(c)
32	(e)	67	(d)	102	(b)	137	(a)	172	(b)
33	(a)	68	(c)	103	(c)	138	(c)	173	(a)
34	(c)	69	(c)	104	(b)	139	(b)	174	(c)
35	(c)	70	(c)	105	(b)	140	(e)		

ANSWERS & EXPLANATIONS

1. (e) $? = 56.6 \times 16.6 \times 6.6$
 $= 6201.096$

2. (c) $\frac{?}{46} \times 16 = 368$
 $\Rightarrow ? = \frac{368 \times 46}{16} = 1058$

3. (e) $? = 999.99 + 99.99 + 9.99 = 1109.97$

4. (a) $? = \frac{899}{11.6} = 77.5$

5. (a) $? = 85332 - 11638 - 60994$
 $? = 85332 - 72632$
 $\therefore ? = 12700$

6. (d) $? = \frac{3187.8}{57.75 \times 0.8} = 69$

7. (d) Let the required number be = x

According to the question,

$$x^2 - (12)^3 = 976$$

$$\text{or, } x^2 - 1728 = 976$$

$$\text{or, } x^2 = 1728 + 976 = 2704$$

$$\text{or, } x = \sqrt{2704} = 52$$

8. (a) $?\ = \frac{351}{6 \times 0.5} = 117$

9. (d) $18 \times ? = \frac{7776}{12}$

$$\Rightarrow ? = \frac{7776}{12 \times 18} = 36$$

10. (e) $?\ = \frac{11 \times 55}{5} + 9$

$$= 121 + 9 = 130$$

11. (a) $?\ = 85333 - 11638 - 60994$

$$?\ = 85333 - 72632$$

$$\therefore ? = 12701$$

12. (c) $?\ = 8^4 - 8^2$

$$= 8^2 (8^2 - 1) = 64 (64 - 1)$$

$$= 64 \times 63 = 4032$$

13. (c) $?\ = 6.3 \times 12.8 \times 9.9 - 69.996$

$$= 798.336 - 69.996 = 728.34$$

14. (d) $?\ = 8 + \left(\frac{18 \times 368}{16} \right)$

$$= 8 + 414 = 422$$

15. (e) $?\ \times 85 = 11059 + 8889 - 908$

$$\Rightarrow ? \times 85 = 19040$$

$$\Rightarrow ? = \frac{19040}{85} = 224$$

16. (a) $?\ - 24848 = 107604$

$$\Rightarrow ? = 107604 + 24848 = 132452$$

17. (b) $?\ = 894.65 + 100.99 - 388.24$

$$= 995.64 - 388.24 = 607.4$$

18. (d) $(?)^2 + (26)^2 = 1181 + 1520$

$$\Rightarrow ?^2 + 676 = 2701$$

$$\Rightarrow ?^2 = 2701 - 676 = 2025$$

$$\Rightarrow ? = \sqrt{2025} = 45$$

19. (e) $\frac{59475}{\sqrt{?}} = 195 \times 5$

$$\Rightarrow \sqrt{?} = \frac{59475}{195 \times 5} = 61$$

$$\Rightarrow 61 \times 61 = 3721$$

20. (b) $\sqrt{?} + 29 = \sqrt{2704}$

$$\Rightarrow \sqrt{?} + 29 = 52$$

$$\Rightarrow \sqrt{?} = 52 - 29 = 23$$

$$\therefore ? = 23 \times 23 = 529$$

21. (a) $39^2 = 1521$; $38^2 = 1444$

$$38^2 < 1500 < 39^2$$

\therefore To make 1500 a perfect square, 21 should be added to it.

22. (d) $1248 \times \frac{5}{6} - 1150 \times \frac{4}{5}$

$$= 1040 - 920 = 120$$

23. (b) $?\ = 235 + 75 \times 8$

$$= 235 + 600 = 835$$

24. (a) $5986 - 2340 = 1496 + ?$

$$\Rightarrow 3646 = 1496 + ?$$

$$\Rightarrow ? = 3646 - 1496 = 2150$$

25. (c) $(7)^{1/4} \times (343)^{0.25} = (7)^{1/4} \times (7^3)^{1/4} = (7^4)^{1/4} = 7$

26. (a) $57.63 - 37.26 = 39.27 - ?$

$$\Rightarrow 20.37 = 39.27 - ?$$

$$\Rightarrow ? = 39.27 - 20.37 = 18.9$$

27. (e) $\sqrt{?} = \sqrt{1089} + \sqrt{289}$

$$= 33 + 17 = 50$$

$$?\ = (50)^2 = 2500$$

28. (c) $?\ = 12.8 \times 2.5 + 8.6$

$$= 32 + 8.6 = 40.6$$

29. (b) $?^2 = (14^2 - 13^2) \div 3$

$$= (14 + 13)(14 - 13) \div 3$$

$$= 27 \times \frac{1}{3} = 9$$

$$\therefore ? = \sqrt{9} = 3$$

30. (e) $(19)^? = \frac{(19)^{12} \times (19)^8}{(19)^4}$

$$\text{or } (19)^? = \frac{(19)^{20}}{(19)^4}$$

$$\text{or } (19)^? = (19)^{20-4} = (19)^{16}$$

$$\text{or } ? = 16$$

31. (b) $?\ = \frac{70.56}{11.2} = 6.3$

32. (e) $x + y = 23$ and $xy = 126$

$$\text{Now } x^2 + y^2 = (x + y)^2 - 2xy$$

$$(23)^2 - 2 \times 126$$

$$529 - 252$$

$$\Rightarrow x^2 + y^2 = 277$$

33. (a) $?\ = 986.23 + 7.952 + 8176.158 = 9170.340$

34. (c) $?\ = \sqrt{1296} \div \sqrt{36}$

$$= 36 \div 6 = 6$$

35. (c) $112 \div 7 \div 4 = 8 \times ?$

$$\Rightarrow 8 \times ? = \frac{112}{7 \times 4}$$

$$\Rightarrow ? = \frac{4}{8} = \frac{1}{2} = 0.5$$

36. (a) $?\ = 3750 \times \frac{4}{8} \times \frac{2}{3} \times \frac{1}{2} = 625$

37. (e) $?\ = \frac{24 + 4}{135 - 9} = \frac{28}{126} = \frac{2}{9}$

38. (b) $?\ = (87324 - 79576) \times 1.5$

$$= 7748 \times 1.5 = 11622$$

39. (a) $? = 350 \times 4 \times 50 = 70000$

40. (e) $? = 11.88 \times \frac{250}{18} = 165$

41. (e) $? = \frac{1}{2} \times \frac{3}{4} \div \left(\frac{9}{2} \times \frac{5}{8} \right)$
 $= \frac{1}{2} \times \frac{3}{4} \div \frac{45}{16}$
 $= \frac{1}{2} \times \frac{3}{4} \times \frac{16}{45} = \frac{2}{15}$

42. (d) $? = \frac{18 + 17 \times 3 - 1}{8 - 15 \div 3 - 1}$
 $= \frac{18 + 51 - 1}{8 - 5 - 1} = \frac{68}{2} = 34$

43. (a) $? = \frac{3}{2} + \frac{5}{3} \div \left(\frac{6}{7} - \frac{5}{6} \right)$
 $= \frac{3}{2} + \frac{5}{3} \div \left(\frac{36 - 35}{42} \right)$
 $= \frac{3}{2} + \frac{5}{3} \div \frac{1}{42} = \frac{3}{2} + \frac{5}{3} \times 42$
 $= \frac{3}{2} + 70 = \frac{3 + 140}{2} = \frac{143}{2}$
 $= 71.5$

44. (e) $\sqrt{?} - 63 = 9^2$
 $\Rightarrow \sqrt{?} = 81 + 63 = 144$

$\Rightarrow ? = (144)^2 = 20736$

45. (e) $916.28 - 72.4 = 728.2 + ?$
 $\Rightarrow 843.88 = 728.2 + ?$
 $\Rightarrow ? = 843.88 - 728.2 = 115.68$

46. (c) $? = 7776 \times \frac{1}{18} \times 3 = 1296$

47. (e) $? = 8994 - 4178 - 2094$
 $= 8994 - 6272 = 2722$

48. (c) $? = 315 \times 114 - 1565$
 $= 35910 - 1565 = 34345$

49. (d) $? = 1256 \div (32 \times 0.25)$
 $= 1256 \div 8 = 157$

50. (a) $? = 69.2 \times 18.4 \times 4.5 = 5729.76$

51. (e) $? = 3.2 \times 6.8 \times 9.5 = 206.72$

52. (c) $? = 15^3 \times 9^3 - (1555)^2$
 $= 3375 \times 729 - 2418025 = 42350$

53. (a) $? = 8 \frac{2}{5} \div 10 \frac{2}{25}$
 $= \frac{42}{5} \div \frac{252}{25}$
 $= \frac{42}{5} \times \frac{25}{252} = \frac{5}{6}$

54. (c) $? = 992 \times \frac{5}{6} \times \frac{3}{4} \times \frac{3}{5} = 372$

55. (d) $\sqrt{?} + 17 = \sqrt{961}$

or $\sqrt{?} + 17 = 31$

or $\sqrt{?} = 31 - 17$

or $\sqrt{?} = 14$

or $? = 14 \times 14 = 196$

56. (a) $? = \frac{123}{6 \times 0.8} = 25.625$

57. (c)

6	3986	63
6	36	
123	386	
3	369	
126	17	

\therefore Clearly, $63^2 < 3986 < 64^2$

$\therefore 64^2 = 4096$

\therefore Required number = $4096 - 3986 = ₹ 110$

58. (b) $? = \sqrt{3781} \times 5.36$
 $\approx 61.5 \times 5.36 \approx 329.64 \approx 330$

59. (a) Let the the number be = x
According o the question,
 $x^2 - 26^2 = 549$
or, $x^2 - 676 = 549$
or, $x^2 = 549 + 676 = 1225$

or, $x = \sqrt{1225} = 35$

60. (b) $? = [(4)^3 \times (5)^4] \div (4)^5$
 $= \frac{4^3 \times 5^4}{4^5} = \frac{5^4}{4^2}$

$= \frac{5 \times 5 \times 5 \times 5}{4 \times 4} = 39.0625$

61. (c) $? = \frac{1.6 \times 3.2}{0.08} = 64$

62. (b) $? = \frac{7857 + 3596 + 4123}{96}$

$= \frac{15576}{96} = 162.25$

63. (e) $? = \frac{5321}{305} \times (19)^2 = 6297.97 \approx 6300$ (approx)

64. (b) Let the number be x.
 $\therefore x^2 + 61^2 = 5242$
 $\Rightarrow x^2 = 5242 - 3721$
 $= 1521$
 $\therefore x = 39$

65. (d) $\therefore \sqrt{4400} \approx 66.33$
 \therefore Required number $= 67^2 - 4400$
 $= 4489 - 4400$
 $= 89$
66. (a) Let the larger and smaller numbers be x and y respectively.
Then, $x - y = 3$... (i)
and, $x^2 - y^2 = 63$
 $\Rightarrow (x + y)(x - y) = 63$
 $\Rightarrow (x + y) = \frac{63}{3} = 21$... (ii)
From equation (i) and (ii), $x = 12$
67. (d) $1248 \times \frac{5}{6} - 1150 \times \frac{4}{5}$
 $= 1040 - 920 = 120$
68. (c) Let the number be x .
Then,
 $x^2 - (74)^2 = 5340$
 $\Rightarrow x^2 = 5340 + 5476$
 $= 10816$
 $\Rightarrow x = \sqrt{10816} = 104$
69. (c) $2x + 3y = 78$... (i)
 $3x + 2y = 72$... (ii)
From equations (i) and (ii),
 $x = 12, y = 18$
 $\therefore x + y = 12 + 18 = 30$
70. (c) $? = 741560 + 935416 + 1143 + 17364 = 1695483$
71. (d) $\frac{(84)^2}{\sqrt{?}} = 168$
 $\sqrt{?} = \frac{84 \times 84}{168} = 42$
 $\Rightarrow ? = (42)^2 = 1764$
72. (d) $? = 514789 - 317463 - 87695 - 11207 = 98424$
73. (e) $? = \sqrt[3]{50623} = \sqrt[3]{(37)^3} = 37$
74. (a) $? = \frac{93336}{17891 + 16239 - 26352} = \frac{93336}{7778} = 12$
75. (a) $? = \frac{1}{4} \times 6624 \times \frac{1}{6} \times 12 = 3312$
76. (e) $? = \frac{18 \times 15 - 50}{(40 \times 80) \div 160} = \frac{220}{20} = 11$
77. (e) $\sqrt{?} = \frac{2296}{\sqrt{1681}} = \frac{2296}{41} = 56$
 $? = (56)^2 = 3136$
78. (d) Let the number be x
According to the question,
 $x^2 - (74)^2 = 3740$
or $x^2 = 3740 + 5476 = 9216$
 $\therefore x = \sqrt{9216} = 96$
79. (a) $? = 93 \times 45 \div 25$
 $= \frac{93 \times 45}{25} = 167.4$
80. (d) $? = \frac{0.2944}{0.08 \times 1.6} = 2.3$
81. (a) $? = 6 \times 66 \times 666 = 263736$
82. (c) $? = \frac{36}{7} \times \frac{49}{6} \times \frac{8}{63}$
 $= \frac{16}{3} = 5\frac{1}{3}$
83. (e) $\frac{(7)^3}{\sqrt{?}} = 14 - 7 = 7$
 $\Rightarrow \sqrt{?} = \frac{7^3}{7} = 49$
 $\Rightarrow ? = 49^2 = 2401$
84. (e) $? = \frac{1035}{\sqrt[3]{12167}} = \frac{1035}{23} = 45$
85. (b) $? = 1256 \times 3892 = 4888352$
86. (b) $? = 0.08 \times 0.5 + 0.9$
 $= 0.04 + 0.9 = 0.94$
87. (d) $? \times 12 = 7847 - \frac{8195}{745}$
 $\Rightarrow ? \times 12 = 7847 - 11 = 7836$
 $\Rightarrow ? = 653$
88. (d) $? = 4123 \div (2.3)^2 - 446$
 $= \frac{4123}{2.3 \times 2.3} - 446$
 $\approx 779 - 446 = 333$ (approx)
89. (c) $x + y = 18$
 $\Rightarrow (x + y)^2 = 18^2 = 324$
 $\Rightarrow x^2 + y^2 + 2xy = 324$
 $\Rightarrow x^2 + y^2 = 324 - 2xy$
 $\Rightarrow x^2 + y^2 = 324 - 2(72)$
 $\Rightarrow x^2 + y^2 = 324 - 144 = 180$
90. (b)
$$\begin{array}{r} 9 \overline{) 8115} \\ \underline{81} \\ 180 \\ \underline{180} \\ 0 \end{array}$$

 \therefore required number $= 91 \times 91 - 8115 = 166$
91. (b) Let the number be x
 $\therefore x^2 - (46)^2 = 485$
 $\Rightarrow x^2 = 485 + (46)^2 = 2601$
 $\therefore x = \sqrt{2601} = 51$
92. (a) $666 \div (2.4 \times ?) = 185$
or $\frac{666}{2.4 \times ?} = 185$
or $? = \frac{666}{2.4 \times 185} = 1.5$

93. (d) $? = 956 \times 753 = 719868$
94. (d) $\frac{3}{8} \times \frac{4}{7} \times ? = 5376$
 or $? \times \frac{3}{14} = 5376$
 or $? = \frac{5376 \times 14}{3} = 25088$
95. (e) $[9^3 \times (?^2)] \div 21 = 1701$
 or $\frac{9^3 \times (?^2)}{21} = 1701$
 or $?^2 = \frac{1701 \times 21}{9 \times 9 \times 9} = 49$
 $\therefore ? = \sqrt{49} = 7$
96. (c) $? = 897214 - (336 + 46521 + 1249 + 632176)$
 $= 897214 - 680282 = 216932$
97. (a) $\sqrt{11881} \times \sqrt{?} = 10137$
 or $109 \times \sqrt{?} = 10137$
 or $\sqrt{?} = \frac{10137}{109} = 93$
 or $? = 93 \times 93 = 8649$
98. (e) $3.5 \times 2.4 \times ? = 42$
 or $? = \frac{42}{3.5 \times 2.4} = 5$
99. (d) $? = \sqrt[3]{804357}$
 $= \sqrt[3]{93 \times 93 \times 93}$
 [from given options]
 $= 93$
100. (c) $\sqrt{?} \div 16 \times 24 = 186$
 or $? = \frac{\sqrt{?}}{16} \times 24 = 186$
 or $\sqrt{?} = \frac{186 \times 16}{24} = 124$
 $\therefore ? = 124 \times 124 = 15376$
101. (e) $\frac{?^2}{(0.04)^2} \times 5.6 = 117740$
 or $(?)^2 = \frac{117740 \times 0.04 \times 0.04}{5.6} = 33.64$
 or $? = \sqrt{33.64} = 5.8$
102. (b) $9418 - ? + 1436 + 2156 = 5658$
 or $13010 - ? = 5658$
 or $? = 13010 - 5658 = 7352$
103. (c) $9865 + ? + 3174 + 2257 = 19425$
 or $? + 15296 = 19425$
 or $? = 19425 - 15296 = 4129$
104. (b) $\frac{9}{?} \times 33824 = 63$
 or $? = \frac{9 \times 33824}{63} = 4832$
105. (b) $(99)^2 - (?^2) + (38)^2 = 8436$
 or $9801 - (?^2) + 1444 = 8436$
 or $11245 - (?^2) = 8436$
 or $(?)^2 = 11245 - 8436 = 2809$
 or $? = \sqrt{2809} = 53$
106. (d) $? = 12.36 \times 18.15 + 21.52$
 $= 224.334 + 21.52$
 $= 245.854$
107. (a) $(98764 + 89881 + 99763 + 66342) \div$
 $(1186 + ? + 1040 + 1870) = 55$
 or $354750 \div (? + 4096) = 55$
 or $\frac{354750}{? + 4096} = 55$
 or $? + 4096 = \frac{354750}{55}$
 or $? + 4096 = 6450$
 or $? = 6450 - 4096 = 2354$
108. (a) $? = (64)^2 \div \sqrt[3]{32 \times 32 \times 32}$
 or $? = \frac{64 \times 64}{32} = 128$
109. (e) $? = \frac{21 \times 14 - 34}{12.4 + 5.6 - 15.5}$
 $= \frac{294 - 34}{18 - 15.5} = \frac{260}{2.5} = 104$
110. (c) $0.09 \times 6.8 \times ? = 2.142$
 or $? = \frac{2.142}{0.09 \times 6.8} = 3.5$
111. (d) $? = 11 + \frac{1}{7} + 2 + \frac{5}{8}$
 $= (11+2) + \left(\frac{1}{7} + \frac{5}{8}\right) = 13 + \left(\frac{8+35}{56}\right)$
 $= 13 + \frac{43}{56} = 13\frac{43}{56}$
112. (d) $894 \div 28 \times \sqrt{589} = ?$
 or $? = \frac{894}{28} \times 24.3 \approx 775.86$
 ≈ 775
113. (e) Let the number be = x
 According to the question,
 $x^2 + 57^2 = 8010$
 or, $x^2 + 3249 = 8010$
 or, $x^2 = 8010 - 3249 = 4761$
 or, $x = \sqrt{4761} = 69$

114. (d) $? = 7275.84 + 124.518 - 889.4$
 $= 7400.358 - 889.4 = 6510.958$
115. (a) $? = \frac{(12+4)(12-4)}{(9+3)(9-3)} = \frac{16 \times 8}{12 \times 6} = \frac{16}{9} = 1\frac{7}{9}$
116. (b) $? = \frac{18800}{470} \div 20 = 40 \div 20 = 2$
117. (d) $\sqrt{?} + 136 = 320 \times \frac{5}{8}$
 or $\sqrt{?} + 136 = 200$
 or $\sqrt{?} = 200 - 136 = 64$
 or $? = 64 \times 64 = 4096$
118. (b) 946.68
119. (c) $? = \frac{0.000016}{0.04} = 0.0004$
120. (d) $? = 4^7 \div (4^2)^4 \times 4 = 4^8 \div 4^8 = 1$
121. (d) $\frac{0.99 \times 1000 \times 14}{11 \times 0.7} = ?$
 $\Rightarrow ? = \frac{990 \times 14}{7.7}$
 $= 1800$
122. (e) $95^{3.7} \div 95^{0.9989} = 95^?$
 or $95^{(3.7 - 0.9989)} = 95^?$
 or $95^{2.7011} = 95^?$
 or $? = 2.7011 \approx 2.7$
123. (b) $\sqrt{10000} + 1891.992$ of $\frac{3.001}{4.987}$
 $= 100 + 1892 \times \frac{3}{5} = 100 + 1135.2$
 $= 1235.2 = 1230$
124. (c) $0.0004 \div 0.0001 \times 36.000009$
 $= 4 \div 1 \times 36 = 144 \approx 145$
126. (c) $? = \frac{9876 \times 14}{24.96} + 215.005 - 309.99$
 $= 395.673 - 94.985 \approx 300$
125. (c) $3739 + 164 \times 27 = 3739 + 4428 = 8167 \approx 8200$
127. (c) $[(135)^2 \div 15 \times 32] \div ? = 45 \times 24$
 or $\left[\frac{135 \times 135 \times 32}{15} \right] \div ? = 45 \times 24$
 or $38880 \div ? = 45 \times 24$
 or $? = \frac{38880}{45 \times 24} = 36$
128. (d) $(96)^2 + (63)^2 = (?)^2 - (111)^2 - 8350$
 or $9216 + 3969 = (?)^2 - 12321 - 8350$
 or $13185 = ?^2 - 20671$
 or $?^2 = 33856$
 or $? = \sqrt{33856} = 184$
129. (c) $4368 - 2158 - 596 - ? = 3421 + 1262$
 or $6526 - 596 - ? = 4683$
 or $? = 5930 - 4683 = 1247$
130. (a) $2172 \div ? = 1832 - 956 - 514$
 or $? = \frac{2172}{?} = 362$
 or $? = \frac{2172}{362} = 6$
131. (b) $? = 666.06 + 66.60 + 0.66 + 6.06 + 6 + 60$
 $= 805.38$
132. (a) $205 \times ? \times 13 = 33625 + 25005$
 or $205 \times ? \times 13 = 58630$
 or $? = \frac{58630}{205 \times 13} = 22$
133. (d) $? = (10)^{24} \times (10)^{-21}$
 $= (10)^{24-21} = 10^3 = 1000$
134. (e)
$$\begin{array}{r} 66 \\ 6 \overline{) 4321} \\ \underline{36} \\ 721 \\ 126 \overline{) 756} \\ \underline{756} \\ -35 \end{array}$$

 $\therefore = (66)^2 - 4321$
 $= 4356 - 4321 = 35$
135. (e) $? = 628.306 + 6.1325 \times 44.0268$
 $? \approx 628 + 6 \times 44$
 $\approx 628 + 264 = 892 \approx 900$
136. (b) $? = 1896 \div 29 + 445$
 $= \frac{1896}{29} + 445$
 $= 65.4 + 445 = 510.4$
 ≈ 510
137. (a) $? = (9795 + 7621 + 938) \div (541 + 831 + 496)$
 $= 18354 \div 1868 \approx 9.8 \approx 9$
138. (c) $814296 \times 36 = ? \times 96324$
 or $? = \frac{814296 \times 36}{96324} \approx 304$
139. (b) $? = 78 \div 5 \div 0.5$
 $= \frac{78}{5 \times 0.5} = 31.2$
140. (e) $? = 12.22 + 22.21 + 221.12$
 $= 255.55$
141. (c) $? = 12^4 \times 12^{13} = 12^{4+13} = 12^{17}$
142. (a) $? = 464 \div (16 \times 2.32)$
 $= \frac{464}{16 \times 2.32} = 12.5$
143. (a) Let the required number be x
 $\therefore x^2 - (9)^3 = 567$
 $x^2 = 567 + 729 = 1296$
 $\therefore x = \sqrt{1296} = \sqrt{(36)^2} = 36$

144. (e) Let the number be x .
According to the question,
 $x^2 - 78^2 = 6460$
or, $x^2 = 6460 + 6084$
or, $x^2 = 12544$
or, $x = \sqrt{12544} = 112$
145. (c) $? = 4275 \div 496 \times 21^2$
 $= \frac{4275 \times (21)^2}{496} \approx \frac{4275 \times 441}{495} \approx 3808 \approx 3810$
146. (c) $? = 14^{13} \times 14^3 = 14^{13+3} = 14^{16}$
147. (d) $69 \times 69 = 4761$
 $68 \times 68 = 4624$
Clearly, $4624 < 4700 < 4761$
 \therefore Hence, 61 should be added to 4700 to make it a perfect square.
148. (e) $? = 21.25 + 47779.1944$
 $= 4800.4444$
149. (c) $? = \frac{3}{5} \times \frac{3}{4} \times \frac{5}{6} \times 992$
 $= \frac{3}{8} \times 992 = 372$
150. (d) $\frac{361.6}{6.4} = 56.5$
151. (b) 9049
152. (e) 206.72
153. (e) 2722
154. (d) $\sqrt{?} = 31 - 17 = 14 = \sqrt{196}$
155. (e) $? = \frac{9441 + 3991 - 606}{53} = \frac{12826}{53} = 242$
156. (a) 95.5
157. (c) $58369 + 69521 - 31972 = ? = 95918$
158. (e) $? = 5470 - 378 \times 19^2$
 $= \frac{5470}{378} \times 361$
 $= 5223.996$
 $= 5224$ (approx)
159. (c) $\therefore \sqrt{3986} = 63.13$
The next higher square is $(64)^2 = 4096$
 \therefore number to be added $= 4096 - 3986 = 110$
160. (c) $? = 832.456 - (539.982 + 123.321)$
 $= 832.456 - 663.303 = 169.153$
161. (a) $236.69 + 356.74 = 393.39 + ?$
or $593.43 = 393.39 + ?$
or $? = 593.43 - 393.39 = 200.04$
162. (a) $? = \frac{35 \times 15 \times 10}{25 \times 2} = 105$
163. (d) $? = 859.05 + 427.89 + 663.17 = 1950.11$
164. (b) $? = \frac{29.05}{7} = 4.15$
165. (e) $? = \frac{558 \times 45}{18 \times 4.5} = 310$
166. (b) $559 + 965 = ? \times 16$
or $1524 = ? \times 16$
or $\Rightarrow ? = \frac{1524}{16} = 95.25$
167. (b) $? = 7 + \frac{3}{4} + 5 + \frac{1}{4} + 8 + \frac{1}{2}$
 $= (7 + 5 + 8) + \left(\frac{3}{4} + \frac{1}{4} + \frac{1}{2}\right)$
 $= 20 + \left(\frac{3+1+2}{4}\right)$
 $= 20 + \frac{3}{2} = 20 + 1 + \frac{1}{2} = 21\frac{1}{2}$
168. (a) $? = 9.1 \times 7.5 \times 6.2$
 $= 423.15$
169. (a) $49 + \sqrt{?} = 87$
or $= 87 - 49 = 38$
or $? = (38)^2 = 1444$
170. (e) $\sqrt{?} = 17 + 22 = 39$
 $\Rightarrow ? = 39 \times 39$
 $= 1521$
171. (c) $? = \frac{5989}{48} \times 11 \approx 124.8 \times 11 \approx 1372$
172. (b) $3x + 5y = 44$... (i)
 $10x - 2y = 16$... (ii)
By equation (i) $\times 2$ + equation (ii) $\times 5$ we have
 $6x + 10y + 50x - 10y = 88 + 80$
or, $56x = 168$
 $\therefore x = \frac{168}{56} = 3$
173. (a) Given, $x + y = 20$ and $xy = 84$
 $\therefore x^2 + y^2 = (x + y)^2 - 2xy$
 $= (20)^2 - 2 \times 84$
 $= 400 - 168 = 232$
174. (c) $? = \sqrt{876} \times 20.6 + 165.34$
 $\approx 29 \times 21 + 165$
 $= 609 + 165 = 774 \approx 775$



ALGEBERIC EXPRESSIONS AND INEQUALITIES

CHAPTER 3

VARIABLE

The unknown quantities used in any equation are known as variables. Generally, they are denoted by the last English alphabet x, y, z etc.

An equation is a statement of equality of two algebraic expressions, which involve one or more unknown quantities, called the variables.

LINEAR EQUATION

An equation in which the highest power of variables is one, is called a linear equation. These equations are called linear because the graph of such equations on the x-y cartesian plane is a straight line.

Linear Equation in one variable : A linear equation which contains only one variable is called **linear equation in one variable**.

The general form of such equations is $ax + b = c$, where a, b and c are constants and $a \neq 0$.

All the values of x which satisfy this equation are called its solution(s).

NOTE : An equation satisfied by all values of the variable is called an identity. For example : $2x + x = 3x$.

EXAMPLE 1. Solve $2x - 5 = 1$

Sol. $2x - 5 = 1$

$$\Rightarrow 2x = 1 + 5$$

$$\Rightarrow 2x = 6 \Rightarrow x = \frac{6}{2} = 3.$$

EXAMPLE 2. Solve $7x - 5 = 4x + 11$

Sol. $7x - 5 = 4x + 11$

$$\Rightarrow 7x - 4x = 11 + 5 \text{ (Bringing like terms together)}$$

$$\Rightarrow 3x = 16 \Rightarrow x = \frac{16}{3} = 5\frac{1}{3}.$$

EXAMPLE 3. Solve $\frac{4}{x} - \frac{3}{2x} = 5$

Sol. $\frac{4}{x} - \frac{3}{2x} = 5 \Rightarrow \frac{8-3}{2x} = 5$

$$\Rightarrow \frac{5}{2x} = 5 \Rightarrow 10x = 5$$

$$\Rightarrow x = \frac{5}{10} = \frac{1}{2}$$

APPLICATIONS OF LINEAR EQUATIONS WITH ONE VARIABLES

EXAMPLE 4. The sum of the digits of a two digit number is 16. If the number formed by reversing the digits is less than the original number by 18. Find the original number.

Sol. Let unit digit be x.

$$\text{Then tens digit} = 16 - x$$

$$\begin{aligned} \therefore \text{Original number} &= 10 \times (16 - x) + x \\ &= 160 - 9x. \end{aligned}$$

On reversing the digits, we have x at the tens place and $(16 - x)$ at the unit place.

$$\therefore \text{New number} = 10x + (16 - x) = 9x + 16$$

$$\text{Original number} - \text{New number} = 18$$

$$(160 - 9x) - (9x + 16) = 18$$

$$160 - 18x - 16 = 18$$

$$-18x + 144 = 18$$

$$-18x = 18 - 144 \Rightarrow 18x = 126$$

$$\Rightarrow x = 7$$

\therefore In the original number, we have unit digit = 7

$$\text{Tens digit} = (16 - 7) = 9$$

Thus, original number = 97

EXAMPLE 5. The denominator of a rational number is greater than its numerator by 4. If 4 is subtracted from the numerator and 2 is added to its denominator, the new number

becomes $\frac{1}{6}$. Find the original number.

Sol. Let the numerator be x.

$$\text{Then, denominator} = x + 4$$

$$\therefore \frac{x-4}{x+4+2} = \frac{1}{6}$$

$$\Rightarrow \frac{x-4}{x+6} = \frac{1}{6}$$

$$\Rightarrow 6(x-4) = x+6$$

$$\Rightarrow 6x - 24 = x + 6 \Rightarrow 5x = 30$$

$$\therefore x = 6$$

Thus, Numerator = 6, Denominator = $6 + 4 = 10$.

Hence the original number = $\frac{6}{10}$.

EXAMPLE 6. A man covers a distance of 33 km in $3\frac{1}{2}$ hours; partly on foot at the rate of 4 km/hr and partly on bicycle at the rate of 10 km/hr. Find the distance covered on foot.

Sol. Let the distance covered on foot be x km.
 \therefore Distance covered on bicycle = $(33 - x)$ km
 \therefore Time taken on foot = $\frac{\text{Distance}}{\text{Speed}} = \frac{x}{4}$ hr.
 \therefore Time taken on bicycle = $\frac{33 - x}{10}$ hr.

The total time taken = $\frac{7}{2}$ hr.

$$\frac{x}{4} + \frac{33 - x}{10} = \frac{7}{2}$$

$$\frac{5x + 66 - 2x}{20} = \frac{7}{2}$$

$$6x + 132 = 140$$

$$6x = 140 - 132$$

$$6x = 8$$

$$x = \frac{8}{6} = 1.33 \text{ km.}$$

\therefore The distance covered on foot is 1.33 km.

Linear equation in two variables : General equation of a linear equation in two variables is $ax + by + c = 0$, where $a, b \neq 0$ and c is a constant, and x and y are the two variables. The sets of values of x and y satisfying any equation are called its solution(s).

Consider the equation $2x + y = 4$. Now, if we substitute $x = -2$ in the equation, we obtain $2(-2) + y = 4$ or $-4 + y = 4$ or $y = 8$. Hence $(-2, 8)$ is a solution. If we substitute $x = 3$ in the equation, we obtain $2(3) + y = 4$ or $6 + y = 4$ or $y = -2$. Hence $(3, -2)$ is a solution. The following table lists six possible values for x and the corresponding values for y , i.e. six solutions of the equation.

x	-2	-1	0	1	2	3
y	8	6	4	2	0	-2

SYSTEMS OF LINEAR EQUATION

Consistent System : A system (of 2 or 3 or more equations taken together) of linear equations is said to be consistent, if it has at least one solution.

Inconsistent System : A system of simultaneous linear equations is said to be inconsistent, if it has no solutions at all.

e.g. $X + Y = 9, \quad 3X + 3Y = 8$

Clearly there are no values of X & Y which simultaneously satisfy the given equations. So the system is inconsistent.



REMEMBER

★ The system $a_1x + b_1y = c_1$ and $a_2x + b_2y = c_2$ has :

- a unique solution, if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$.
- Infinitely many solutions, if $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$.
- No solution, if $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$.

- ★ The homogeneous system $a_1x + b_1y = 0$ and $a_2x + b_2y = 0$ has the only solution $x = y = 0$ when $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$.
- ★ The homogeneous system $a_1x + b_1y = 0$ and $a_2x + b_2y = 0$ has a non-zero solution only when $\frac{a_1}{a_2} = \frac{b_1}{b_2}$, and in this case, the system has an infinite number of solutions.

EXAMPLE 7. Find k for which the system $3x - y = 4, \quad kx + y = 3$ has a infinitely many solution.

Sol. The given system will have infinite solution,

if $\frac{a_1}{a_2} = \frac{b_1}{b_2}$ i.e. $\frac{3}{k} = \frac{-1}{1}$ or $k = 3$.

EXAMPLE 8. Find k for which the system $6x - 2y = 3, \quad kx - y = 2$ has a unique solution.

Sol. The given system will have a unique solution,

if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ i.e. $\frac{6}{k} \neq \frac{-2}{-1}$ or $k \neq 3$.

EXAMPLE 9. What is the value of k for which the system $x + 2y = 3, \quad 5x + ky = -7$ is inconsistent?

Sol. The given system will be inconsistent if $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

i.e. if $\frac{1}{5} = \frac{2}{k} \neq \frac{3}{-7}$ or $k = 10$.

EXAMPLE 10. Find k such that the system $3x + 5y = 0, \quad kx + 10y = 0$ has a non-zero solution.

Sol. The given system has a non zero solution,

if $\frac{3}{k} = \frac{5}{10}$ or $k = 6$

QUADRATIC EQUATION

An equation of the degree two of one variable is called quadratic equation.

General form : $ax^2 + bx + c = 0$(1) where a, b and c are all real number and $a \neq 0$.

For Example :

$2x^2 - 5x + 3 = 0; \quad 2x^2 - 5 = 0; \quad x^2 + 3x = 0$

A quadratic equation gives two and only two values of the unknown variable and both these values are called the roots of the equation.

The roots of the quadratic equation (1) can be evaluated using the following formula.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad \dots(2)$$

The above formula provides both the roots of the quadratic equation, which are generally denoted by α and β ,

say $\alpha = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$ and $\beta = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$

The expression inside the square root $b^2 - 4ac$ is called the DISCRIMINANT of the quadratic equation and denoted by D . Thus, Discriminant $(D) = b^2 - 4ac$.

EXAMPLE 11. Which of the following is a quadratic equation?

- (a) $x^{\frac{1}{2}} + 2x + 3 = 0$
 (b) $(x-1)(x+4) = x^2 + 1$
 (c) $x^4 - 3x + 5 = 0$
 (d) $(2x+1)(3x-4) = 2x^2 + 3$

Sol. (d) Equations in options (a) and (c) are not quadratic equations as in (a) max. power of x is fractional and in (c), it is not 2 in any of the terms.

For option (b), $(x-1)(x+4) = x^2 + 1$

$$\text{or } x^2 + 4x - x - 4 = x^2 + 1$$

$$\text{or } 3x - 5 = 0$$

which is not a quadratic equations but a linear.

For option (d), $(2x+1)(3x-4) = 2x^2 + 3$

$$\text{or } 6x^2 - 8x + 3x - 4 = 2x^2 + 3$$

$$\text{or } 4x^2 - 5x - 7 = 0$$

which is clearly a quadratic equation.

EXAMPLE 12. Solve $2x^2 + 6 = 7x$

Sol. $2x^2 + 6 = 7x$

$$\Rightarrow 2x^2 - 7x + 6 = 0$$

$$\Rightarrow 2x^2 - 4x - 3x + 6 = 0$$

$$\Rightarrow 2x(x-2) - 3(x-2) = 0$$

$$\Rightarrow (2x-3)(x-2) = 0$$

$$\text{Either } 2x-3=0 \text{ or } x-2=0$$

$$\Rightarrow 2x=3 \text{ or } x=2$$

$$\Rightarrow x=3/2 \text{ or } x=2$$

\therefore Solutions or roots of given quadratic equation

$$2x^2 + 6 = 7x \text{ are } \frac{3}{2} \text{ and } 2.$$

EXAMPLE 13. Solve $x - \frac{1}{x} = 1\frac{1}{2}$

Sol. $x - \frac{1}{x} = 1\frac{1}{2} \Rightarrow \frac{x^2 - 1}{x} = \frac{3}{2}$

$$\Rightarrow 2(x^2 - 1) = 3x$$

$$\Rightarrow 2x^2 - 2 = 3x$$

$$\Rightarrow 2x^2 - 3x - 2 = 0$$

$$\Rightarrow 2x^2 - 4x + x - 2 = 0$$

$$\Rightarrow 2x(x-2) + 1(x-2) = 0$$

$$\Rightarrow (2x+1)(x-2) = 0$$

$$\text{Either } 2x+1=0 \text{ or } x-2=0$$

$$\Rightarrow 2x = -1 \text{ or } x = 2$$

$$\Rightarrow x = \frac{-1}{2} \text{ or } x = 2$$

$$\therefore x = \frac{-1}{2}, 2 \text{ are solutions.}$$

Nature of Roots : The nature of roots of the equation depends upon the nature of its discriminant D .

- If $D < 0$, then the roots are non-real complex, Such roots are always conjugate to one another. That is, if one root is $p + iq$ then other is $p - iq$, $q \neq 0$.
- If $D = 0$, then the roots are real and equal. Each root of the equation becomes $-\frac{b}{2a}$. Equal roots are referred as repeated roots or double roots also.
- If $D > 0$ then the roots are real and unequal.
- In particular, if a, b, c are rational number, $D > 0$ and D is a perfect square, then the roots of the equation are rational number and unequal.
- If a, b, c , are rational number, $D > 0$ but D is not a perfect square, then the roots of the equation are irrational (surd). Surd roots are always conjugate to one another, that is if one root is $p + \sqrt{q}$, then the other is $p - \sqrt{q}$, $q > 0$.
- If a, b and c are integers, $D > 0$ and perfect square, then the roots of the equation are integers.

Sign of Roots : Let α, β are real roots of the quadratic equation $ax^2 + bx + c = 0$ that is $D = b^2 - 4ac \geq 0$. Then

- Both the roots are positive if a and c have the same sign and the sign of b is opposite.
- Both the roots are negative if a, b and c all have the same sign.
- The Roots have opposite sign if sign of a and c are opposite.
- The Roots are equal in magnitude and opposite in sign if $b = 0$ [that is its roots α and $-\alpha$]
- The roots are reciprocal if $a = c$.
[that is the roots are α and $\frac{1}{\alpha}$]
- If $c = 0$, then one root is zero.
- If $b = c = 0$, then both the roots are zero.
- If $a = 0$, then one root is infinite.
- If $a = b = 0$, then both the roots are infinite.
- If $a = b = c = 0$, then the equation becomes an identity
- If $a + b + c = 0$ then one root is always unity and the other root is $\frac{c}{a}$, Hence the roots are rational provided a, b, c , are rational.

EXAMPLE 14. The solutions of the equation

$$\sqrt{25 - x^2} = x - 1 \text{ are :}$$

- (a) $x = 3$ and $x = 4$ (b) $x = 5$ and $x = 1$
 (c) $x = -3$ and $x = 4$ (d) $x = 4$ and $x = -3$

Sol. (d) $\sqrt{25 - x^2} = x - 1$

$$\text{or } 25 - x^2 = (x-1)^2 \text{ or } 25 - x^2 = x^2 + 1 - 2x$$

$$\text{or } 2x^2 - 2x - 24 = 0 \text{ or } x^2 - x - 12 = 0$$

$$\text{or } (x-4)(x+3) = 0 \text{ or } x = 4, x = -3$$

EXAMPLE 15. Which of the following equations has real roots ?

- (a) $3x^2 + 4x + 5 = 0$ (b) $x^2 + x + 4 = 0$
 (c) $(x-1)(2x-5) = 0$ (d) $2x^2 - 3x + 4 = 0$

Sol. (c) Roots of a quadratic equation

$ax^2 + bx + c = 0$ are real if $b^2 - 4ac \geq 0$
 Let us work with options as follows.

Option (a) : $3x^2 + 4x + 5 = 0$

$$b^2 - 4ac = (4)^2 - 4(3)(5) = -44 < 0.$$

Thus, roots are not real.

(b) : $x^2 + x + 4 = 0$

$$b^2 - 4ac = (1)^2 - 4(1)(4) = 1 - 16 = -15 < 0$$

Thus, roots are not real.

(c) : $(x-1)(2x-5) = 0 \Rightarrow 2x^2 - 7x + 5 = 0$

$$b^2 - 4ac = (-7)^2 - 4 \times 2 \times 5 = 49 - 40 = 9 > 0$$

Thus roots are real.

or $x = 1$ and $x = \frac{5}{2} > 0$; Thus, equation has real roots.

(d) : $2x^2 - 3x + 4 = 0$

$$b^2 - 4ac = (-3)^2 - 4(2)(4) = 9 - 32 = -23 < 0$$

Thus, roots are not real.

Hence, option (c) is correct.

EXAMPLE 16. If $2x^2 - 7xy + 3y^2 = 0$, then the value of x :

y is :

- (a) 3 : 2 (b) 2 : 3
 (c) 3 : 1 or 1 : 2 (d) 5 : 6

Sol. (c) $2x^2 - 7xy + 3y^2 = 0$

$$2\left(\frac{x}{y}\right)^2 - 7\left(\frac{x}{y}\right) + 3 = 0$$

$$\frac{x}{y} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{7 \pm \sqrt{49 - 24}}{2 \times 2} = \frac{7 \pm 5}{4} = 3, \frac{1}{2}$$

$$\Rightarrow \frac{x}{y} = \frac{3}{1} \text{ or } \frac{x}{y} = \frac{1}{2}$$

EXAMPLE 17. If $a + b + c = 0$ and a, b, c , are rational numbers then the roots of the equation

$(b + c - a)x^2 + (c + a - b)x + (a + b - c) = 0$ are

- (a) rational (b) irrational
 (c) non real (d) none of these.

Sol. (a) The sum of coefficients

$$= (b + c - a) + (c + a - b) + (a + b - c) = a + b + c = 0 \quad (\text{given})$$

$\therefore x = 1$ is a root of the equation

\therefore The other root is $\frac{a + b - c}{b + c - a}$, which is rational as $a,$

b, c , are rational

Hence, both the roots are rational.

ALTERNATIVE:

$$D = (c + a - b)^2 - 4(b + c - a)(a + b - c)$$

$$= (-2b)^2 - 4(-2a)(-2c) = 4b^2 - 16ac$$

$$= 4(a + c)^2 - 16ac = 4[(a + c)^2 - 4ac] = [2(a - c)]^2$$

D is a perfect square. Hence, the roots of the equation are rational.

EXAMPLE 18. Both the roots of the equation

$(x - b)(x - c) + (x - c)(x - a) + (x - a)(x - b) = 0$ are

- (a) dependent on a, b, c (b) always non real
 (c) always real (d) rational

Sol. (c) The equation is

$$3x^2 - 2(a + b + c)x + (bc + ca + ab) = 0$$

The discriminant

$$D = 4(a + b + c)^2 - 4 \cdot 3 \cdot (bc + ca + ab)$$

$$= 4[a^2 + b^2 + c^2 - ab - bc - ca]$$

$$= 2[(a^2 - 2ab + b^2) + (b^2 - 2bc + c^2) + (c^2 - 2ca + a^2)]$$

$$= 2[(a - b)^2 + (b - c)^2 + (c - a)^2] \geq 0$$

\therefore Roots are always real.

Symmetric Functions of Roots : An expression in α, β is called a symmetric function of α, β if the function is not affected by interchanging α and β . If α, β are the roots of the quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$ then,

$$\text{Sum of roots : } \alpha + \beta = -\frac{b}{a} = -\frac{\text{coefficient t of } x}{\text{coefficient t of } x^2}$$

$$\text{and Product of roots : } \alpha\beta = \frac{c}{a} = \frac{\text{constant term}}{\text{coefficient t of } x^2}$$

NOTE:

- Above relations hold for any quadratic equation whether the coefficients are real or non-real complex.
- With the help of above relations many other symmetric functions of α and β can be expressed in terms of the coefficients a, b and c .
- Recurrence Relation

$$\alpha^n + \beta^n = (\alpha + \beta)(\alpha^{n-1} + \beta^{n-1}) - \alpha\beta(\alpha^{n-2} + \beta^{n-2})$$

- Some symmetric functions of roots are

$$(i) \alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta$$

$$(ii) \alpha - \beta = \pm \sqrt{(\alpha + \beta)^2 - 4\alpha\beta}$$

$$(iii) \alpha^2 - \beta^2 = \pm (\alpha + \beta)(\alpha - \beta) = \pm (\alpha + \beta) \sqrt{(\alpha + \beta)^2 - 4\alpha\beta}$$

$$(iv) \alpha^3 + \beta^3 = (\alpha + \beta)^3 - 3\alpha\beta(\alpha + \beta)$$

(v) $\alpha^3 - \beta^3 = (\alpha - \beta)^3 + 3\alpha\beta(\alpha - \beta)$ &

$$\alpha - \beta = \pm\sqrt{(\alpha + \beta)^2 - 4\alpha\beta}$$

(vi) $\alpha^4 + \beta^4 = (\alpha^2 + \beta^2)^2 - 2\alpha^2\beta^2$
 $= [(\alpha + \beta)^2 - 2\alpha\beta]^2 - 2(\alpha\beta)^2$

(vii) $\alpha^4 - \beta^4 = (\alpha^2 + \beta^2)(\alpha^2 - \beta^2)$
 $= [(\alpha + \beta)^2 - 2\alpha\beta] \left[\pm\sqrt{(\alpha + \beta)^2 - 4\alpha\beta} \right]$

FORMATION OF QUADRATIC EQUATION WITH GIVEN ROOTS:

➤ An equation whose roots are α and β can be written as $(x - \alpha)(x - \beta) = 0$ or $x^2 - (\alpha + \beta)x + \alpha\beta = 0$ or $x^2 - (\text{sum of the roots})x + \text{product of the roots} = 0$.

➤ Further if α and β are the roots of a quadratic equation $ax^2 + bx + c = 0$, then

$$ax^2 + bx + c = a(x - \alpha)(x - \beta) \text{ is an identity.}$$

A number of relations between the roots can be derived using this identity by substituting suitable values of x real or imaginary.

Condition of a Common Root between two quadratic equations:

Consider two quadratic equations

$$a_1x^2 + b_1x + c_1 = 0 \quad \dots(i)$$

and $a_2x^2 + b_2x + c_2 = 0 \quad \dots(ii)$

Let α be a common root of the two equations

Then $a_1\alpha^2 + b_1\alpha + c_1 = 0$ and $a_2\alpha^2 + b_2\alpha + c_2 = 0$

On solving we get

$$\frac{\alpha^2}{b_1c_2 - b_2c_1} = \frac{\alpha}{c_1a_2 - c_2a_1} = \frac{1}{a_1b_2 - a_2b_1}$$

or $\alpha^2 = \frac{b_1c_2 - b_2c_1}{a_1b_2 - a_2b_1} = \left(\frac{c_1a_2 - c_2a_1}{a_1b_2 - a_2b_1} \right)^2$

Which gives the common root as well as the condition for common root.

Condition that two quadratic equations have both the Roots Common:

Suppose that the equations $a_1x^2 + b_1x + c_1 = 0$ and $a_2x^2 + b_2x + c_2 = 0$ have both the roots common.

then $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

If the coefficients of two quadratic equations are rational (real) and they have one irrational (imaginary) root common then they must have both the roots common as such roots occur in conjugate pair.

EXAMPLE 19. Of the following quadratic equations, which is the one whose roots are 2 and -15?

- (a) $x^2 - 2x + 15 = 0$ (b) $x^2 + 15x - 2 = 0$

(c) $x^2 + 13x - 30 = 0$ (d) $x^2 - 30 = 0$

Sol. (c) Sum of roots = $2 - 15 = -13$
 Product of roots = $2 \times (-15) = -30$
 Required equation
 $= x^2 - x(\text{sum of roots}) + \text{product of roots} = 0$
 $\Rightarrow x^2 + 13x - 30 = 0$

EXAMPLE 20. If a and b are the roots of the equation

$x^2 - 6x + 6 = 0$, then the value of $a^2 + b^2$ is:

- (a) 36 (b) 24 (c) 17 (d) 6

Sol. (b) The sum of roots = $a + b = 6$
 Product of roots = $ab = 6$

Now, $a^2 + b^2 = (a + b)^2 - 2ab = 36 - 12 = 24$

EXAMPLE 21. If α and β are the roots of the quadratic

equation $ax^2 + bx + c = 0$, then the value of $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha}$ is:

- (a) $\frac{3bc - a^3}{b^2c}$ (b) $\frac{3abc - b^3}{a^2c}$
 (c) $\frac{3abc - b^2}{a^3c}$ (d) $\frac{ab - b^2c}{2b^2c}$

Sol. (b) Here, $\alpha + \beta = -\frac{b}{a}$ and $\alpha\beta = \frac{c}{a}$

Thus, $\frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha} = \frac{\alpha^3 + \beta^3}{\alpha\beta}$

$$= \frac{(\alpha + \beta)(\alpha^2 - \alpha\beta + \beta^2)}{\alpha\beta} \quad \dots\dots(i)$$

Now, $(\alpha^2 + \beta^2 - \alpha\beta) = [(\alpha + \beta)^2 - 2\alpha\beta - \alpha\beta]$

$$= [(\alpha + \beta)^2 - 3\alpha\beta]$$

Hence (i) becomes

$$\Rightarrow \frac{(\alpha + \beta)[(\alpha + \beta)^2 - 3\alpha\beta]}{\alpha\beta} = \frac{-b \left[\frac{b^2}{a^2} - \frac{3c}{a} \right]}{\frac{c}{a}}$$

$$= \frac{-b \left[\frac{b^2 - 3ac}{a^2} \right]}{\frac{c}{a}} = \frac{3abc - b^3}{a^2c}$$

EXAMPLE 22. If a, b are the two roots of a quadratic equation such that $a + b = 24$ and $a - b = 8$, then the quadratic equation having a and b as its roots is:

- (a) $x^2 + 2x + 8 = 0$ (b) $x^2 - 4x + 8 = 0$
 (c) $x^2 - 24x + 128 = 0$ (d) $2x^2 + 8x + 9 = 0$

Sol. (c) $a + b = 24$ and $a - b = 8$
 $\Rightarrow a = 16$ and $b = 8 \Rightarrow ab = 16 \times 8 = 128$
 A quadratic equation with roots a and b is
 $x^2 - (a + b)x + ab = 0$ or $x^2 - 24x + 128 = 0$

Inequalities : A statement or equation which states that one thing is not equal to another, is called an inequation.

Symbols :

'<' means "is less than"

'>' means "is greater than"

'≤' means "is less than or equal to"

'≥' means "is greater than or equal to"

For example :

(a) $x < 3$ means x is less than 3.

(b) $y \geq 9$ means y is greater than or equal to 9.

PROPERTIES

- Adding the same number to each side of an equation does not effect the sign of inequality, it remains same, i.e. if $x > y$ then, $x + a > y + a$.
- Subtracting the same number to each side of an inequation does not effect the sign of inequality, i.e., if $x < y$ then, $x - a < y - a$.
- Multiplying each side of an inequality with same number does not effect the sign of inequality, i.e., if $x \leq y$ then $ax \leq ay$ (where, $a > 0$).
- Multiplying each side of an inequality with a negative number effects the sign of inequality or sign of inequality reverses, i.e., if $x < y$ then $ax > ay$ (where $a < 0$).
- Dividing each side of an inequation by a positive number does not effect the sign of inequality, i.e., if $x \leq y$ then $\frac{x}{a} \leq \frac{y}{a}$ (where $a > 0$).
- Dividing each side of an inequation by a negative number reverses the sign of inequality, i.e., if $x > y$ then $\frac{x}{a} < \frac{y}{a}$ (where $a < 0$).



REMEMBER

- ★ If $a > b$ and a, b, n are positive, then $a^n > b^n$ but $a^{-n} < b^{-n}$.
For example $5 > 4$; then $5^3 > 4^3$ or $125 > 64$, but $5^{-3} < 4^{-3}$ or $\frac{1}{125} < \frac{1}{64}$.
- ★ If $a > b$ and $c > d$, then $(a + c) > (b + d)$.
- ★ If $a > b > 0$ and $c > d > 0$, then $ac > bd$.
- ★ If the signs of all the terms of an inequality are changed, then the sign of the inequality will also be reversed.

MODULUS :

$$|x| = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$$

- If a is positive real number, x and y be the fixed real numbers, then

$$(i) |x - y| < a \Leftrightarrow y - a < x < y + a$$

$$(ii) |x - y| \leq a \Leftrightarrow y - a \leq x \leq y + a$$

$$(iii) |x - y| > a \Leftrightarrow x > y + a \text{ or } x < y - a \quad (iv) |x - y| \geq a \Leftrightarrow x \geq y + a \text{ or } x \leq y - a$$

2. Triangle inequality :

$$(i) |x + y| \leq |x| + |y|, \forall x, y \in \mathbb{R}$$

$$(ii) |x - y| \geq |x| - |y|, \forall x, y \in \mathbb{R}$$

EXAMPLE 23. If $a - 8 = b$, then determine the value of

$$|a - b| - |b - a|.$$

(a) 16

(b) 0

(c) 4

(d) 2

Sol. (b) $|a - b| = |8| = 8$

$$\Rightarrow |b - a| = |-8| = 8$$

$$\Rightarrow |a - b| - |b - a| = 8 - 8 = 0$$

EXAMPLE 24. Solve : $3x + 4 \leq 19, x \in \mathbb{N}$

Sol. $3x + 4 \leq 19$

$$3x + 4 - 4 \leq 19 - 4 \quad [\text{Subtracting 4 from both the sides}]$$

$$3x \leq 15$$

$$\frac{3x}{3} \leq \frac{15}{3} \quad [\text{Dividing both the sides by 3}]$$

$$x \leq 5; x \in \mathbb{N}$$

$$\therefore x = \{1, 2, 3, 4, 5\}.$$

EXAMPLE 25. Solve $5 \leq 2x - 1 \leq 11$

Sol. $5 \leq 2x - 1 \leq 11$

$$5 + 1 \leq 2x - 1 + 1 \leq 11 + 1$$

[Adding 1 to each sides]

$$6 \leq 2x \leq 12$$

$$\frac{6}{2} \leq \frac{2x}{2} \leq \frac{12}{2}$$

[Dividing each side by 2]

$$3 \leq x \leq 6$$

$$\Rightarrow x = \{3, 4, 5, 6\}.$$

EXAMPLE 26. The solution set of

$$x - 2y \geq 0; 2x - y \leq -2; x \geq 0; y \geq 0 \text{ is :}$$

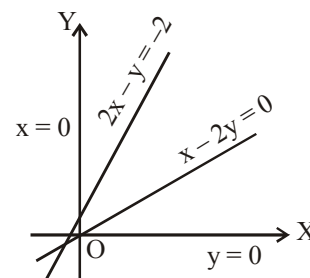
(a) Empty

(b) Bounded

(c) Neither empty nor bounded

(d) None of these

Sol. (a) Plotting the given inequations, we get the following graph :



There is no common region. Hence, the solution set is empty.

EXAMPLE 27. If $x \geq 0, y \geq 0$ and $(x + y) \leq 1$, then the maximum value of $(2x + 3y)$ is

- (a) 2 (b) 3 (c) 4 (d) 5

Sol. (b) It is given that $x \geq 0, y \geq 0$ and $x + y \leq 1$.
 $x + y \leq 1 \Rightarrow 2(x + y) \leq 2 \Rightarrow 2x + 2y \leq 2$
 $\Rightarrow 2x + 2y + y \leq 2 + y$
 $\Rightarrow 2x + 3y \leq 2 + 1 = 3$. (since $y \leq 1$).

EXAMPLE 28. If $x^2 + x + \frac{1}{x^2} + \frac{1}{x} < 0$, then which of the following is true?

- (a) $x + \frac{1}{x} > -2$ (b) $x + \frac{1}{x} < -2$
 (c) $x + \frac{1}{x} < 1$ (d) Both (a) and (c)

Sol. (d) Given that $\left(x^2 + \frac{1}{x^2}\right) + \left(x + \frac{1}{x}\right) < 0$

$$\left(x + \frac{1}{x}\right)^2 + \left(x + \frac{1}{x}\right) - 2 < 0$$

Substituting $x + \frac{1}{x} = y$, we get

$$y^2 + y - 2 < 0$$

$$\Rightarrow (y - 1)(y + 2) < 0$$

$$\therefore \text{either } y - 1 < 0; y + 2 > 0$$

$$\text{or } y + 2 < 0; y - 1 > 0.$$

i.e., $y < 1, y > -2$ or $y < -2; y > 1$
 ||
 not possible

Therefore, $-2 < y < 1$

$$\text{i.e. } -2 < \left(x + \frac{1}{x}\right) < 1$$

APPLICATIONS

Formulation of Equations/Expressions:

A formula is an equation, which represents the relations between two or more quantities.

For example:

Area of parallelogram (A) is equal to the product of its base (b) and height (h), which is given by

$$A = b \times h$$

$$\text{or } A = bh.$$

Perimeter of triangle (P),

$$P = a + b + c, \text{ where } a, b \text{ and } c \text{ are three sides.}$$

EXAMPLE 29. Form the expression for each of the following:

- (a) 5 less than a number is 7.
 (b) Monika's salary is 1500 less than thrice the salary of Surbhi.

Sol. (a) Expression is given by $x - 5 = 7$, where x is any number

(b) Let the salary of Surbhi be Rs. x and salary of Monika be Rs. y.

Now, according to the question

$$y = 3x - 1500$$

More Applications of Equations:

Problems on Ages can be solved by linear equations in one variable, linear equations in two variables, and quadratic equations.

EXAMPLE 30. Kareem is three times as old as his son. After ten years, the sum of their ages will be 76 years. Find their present ages.

Sol. Let the present age of Kareem's son be x years.

Then, Kareem's age = 3x years

After 10 years, Kareem's age = 3x + 10 years

and Kareem's son's age = x + 10 years

$$\therefore (3x + 10) + (x + 10) = 76$$

$$\Rightarrow 4x = 56 \Rightarrow x = 14$$

$$\therefore \text{Kareem's present age} = 3x = 3 \times 14 = 42 \text{ years}$$

$$\text{Kareem's son's age} = x = 14 \text{ years.}$$

EXAMPLE 31. The present ages of Vikas and Vishal are in the ratio 15 : 8. After ten years, their ages will be in the ratio 5 : 3. Find their present ages.

Sol. Let the present ages of Vikas and Vishal be 15x years and 8x years.

After 10 years,

$$\text{Vikas's age} = 15x + 10 \text{ and}$$

$$\text{Vishal's age} = 8x + 10$$

$$\therefore \frac{15x + 10}{8x + 10} = \frac{5}{3}$$

$$\Rightarrow 3(15x + 10) = 5(8x + 10)$$

$$\Rightarrow 45x + 30 = 40x + 50$$

$$\Rightarrow 5x = 20 \Rightarrow x = \frac{20}{5} = 4$$

$$\therefore \text{Present age of Vikas} = 15x = 15 \times 4 = 60 \text{ years}$$

$$\text{Present age of Vishal} = 8x = 8 \times 4 = 32 \text{ years.}$$

EXAMPLE 32. Father's age is 4 less than five times the age of his son and the product of their ages is 288. Find the father's age.

Sol. Let the son's age be x years.

So, father's age = 5x - 4 years.

$$\therefore x(5x - 4) = 288$$

$$\Rightarrow 5x^2 - 4x - 288 = 0 \Rightarrow 5x^2 - 40x + 36x - 288 = 0$$

$$\Rightarrow 5x(x - 8) + 36(x - 8) = 0$$

$$\Rightarrow (5x + 36)(x - 8) = 0$$

$$\text{Either } x - 8 = 0 \text{ or } 5x + 36 = 0 \Rightarrow x = 8 \text{ or } x = \frac{-36}{5}$$

x cannot be negative; therefore, x = 8 is the solution.

$$\therefore \text{Son's age} = 8 \text{ years and Father's age} = 5x - 4 = 36 \text{ years.}$$

If present age of the father is F times the age of his son. T years hence, the father's age become Z times the age of son

$$\text{then present age of his son is given by } \frac{(Z-1)T}{(F-Z)}$$

EXAMPLE 33. Present age of the father is 9 times the age of his son. One year later, father's age become 7 times the age of his son. What are the present ages of the father and his son.

Sol. By the formula

$$\text{Son's age} = \frac{(7-1)}{(9-7)} \times 1 = \frac{6}{2} \times 1 = 3 \text{ years.}$$

So, father's age = $9 \times \text{son's age} = 9 \times 3 = 27$ years.

If T_1 years earlier the age of the father was n times the age of his son, T_2 years hence, the age of the father becomes m times the age of his son then his son's age is given by

$$\text{Son's age} = \frac{T_2(n-1) + T_1(m-1)}{n-m}$$

EXAMPLE 34. 10 years ago, Shakti's mother was 4 times older than her. After 10 years, the mother will be twice older than the daughter. What is the present age of Shakti?

Sol. By using formula,

$$\text{Shakti's age} = \frac{10(4-1) + 10(2-1)}{4-2} = 20 \text{ years.}$$

Present age of Father : Son = $a : b$

After / Before T years = $m : n$

$$\text{Then son's age} = b \times \frac{T(m-n)}{an-bm}$$

$$\text{and Father's age} = a \times \frac{T(m-n)}{an-bm}$$

EXAMPLE 35. The ratio of the ages of the father and the son at present is 3 : 1. Four years earlier, the ratio was 4 : 1. What are the present ages of the son and the father?

Sol. Ratio of present age of Father and Son = 3 : 1

4 years before = 4 : 1

$$\text{Son's age} = 1 \times \frac{4(4-1)}{4 \times 1 - 3 \times 1} = 12 \text{ years.}$$

$$\text{Father's age} = 3 \times \frac{4(4-1)}{4 \times 1 - 3 \times 1} = 36 \text{ years.}$$

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EXERCISE

Directions (Qs. 1-5): In each question one/two equations are provided. On the basis of these you have to find out the relation between p and q .

Give answer (a) if $p = q$

Give answer (b) if $p > q$

Give answer (c) if $q > p$

Give answer (d) if $p \geq q$, and

Give answer (e) if $q \geq p$

1. I $pq + 30 = 6p + 5q$
2. I $2p^2 + 12p + 16 = 0$
II $2q^2 + 14q + 24 = 0$
3. I $2p^2 + 48 = 20p$
II $2q^2 + 18 = 12q$
4. I $q^2 + q = 2$
II $p^2 + 7p + 10 = 0$
5. I $p^2 + 36 = 12p$
II $4q^2 + 144 = 48q$

Directions (Qs.6-10): For the two given equations I and II give answer

(a) if p is greater than q

(b) if p is smaller than q

(c) if p is equal to q .

(d) if p is either equal to or greater than q

(e) if p is either equal to or smaller than q .

6. I $6p^2 + 5p + 1 = 0$
II $20q^2 + 9q = -1$
7. I $3p^2 + 2p - 1 = 0$
II $2q^2 + 7q + 6 = 0$
8. I $3p^2 + 15p = -18$
II $q^2 + 7q + 12 = 0$
9. I $p = \frac{\sqrt{4}}{\sqrt{9}}$
II $9q^2 - 12q + 4 = 0$
10. I $p^2 + 13p + 42 = 0$
II $q^2 = 36$

Directions (Qs. 11 - 14): In each of the following questions, one or two equation(s) is/are given. On their basis you have to determine the relation between x and y and then give answer

(a) if $x < y$

(b) if $x > y$

(c) if $x \leq y$

(d) if $x \geq y$

(e) if $x = y$

11. I $x^2 + 3x + 2 = 0$ II. $2y^2 = 5y$
12. I $2x^2 + 5x + 2 = 0$ II. $4y^2 = 1$
13. I $y^2 + 2y - 3 = 0$ II. $2x^2 - 7x + 6 = 0$
14. I $x^2 - 5x + 6 = 0$ II. $y^2 + y - 6 = 0$

Directions (Qs. 15-18): In each of the following questions two equations are given. You have to solve them and Give answer

(a) if $p < q$

(b) if $p > q$

(c) if $p \leq q$

(d) if $p \geq q$

(e) if $p = q$

15. I $p^2 - 7p = -12$
II $q^2 - 3q + 2 = 0$
16. I $12p^2 - 7p = -1$
II $6q^2 - 7q + 2 = 0$
17. I $p^2 - 8p + 15 = 0$
II $q^2 - 5q = -6$
18. I $2p^2 + 20p + 50 = 0$
II $q^2 - 25$

Directions (Qs.19-23): In each of these questions two equations are given. You have to solve these equations and Give answer

(a) if $x < y$

(b) if $x > y$

(c) if $x = y$

(d) if $x \geq y$

(e) if $x \leq y$

19. I $x^2 - 6x = 7$
II $2y^2 + 13y + 15 = 0$
20. I $3x^2 - 7x + 2 = 0$
II $2y^2 - 11y + 15 = 0$
21. I $10x^2 - 7x + 1 = 0$
II $35y^2 - 12y + 1 = 0$
22. I $4x^2 = 25$
II $2y^2 - 13y + 21 = 0$
23. I $3x^2 + 7x = 6$
II $6(2y^2 + 1) = 17y$

Directions (Qs. 24-26): In each question below one or more equation(s) is /are given. On the basis of these, you have to find out the relationship between p and q .

Give answer (a) if $p = q$

Give answer (b) if $p > q$

Give answer (c) if $p < q$

Give answer (d) if $p \leq q$

Give answer (e) if $p \geq q$

24. I $2p^2 = 23p - 63$
II $2q(q - 8) = q^{-36}$
25. I $p(p^{-1}) = (p^{-1})$
II $q^2 = 4q^{-1}$
26. I $2p(p - 4) = 8(p + 5)$
II $q^2 + 12 + 7q$

Directions (Q. 27-30): In each of the following questions two equations I and II are given. You have to solve both the equations and give answer

(a) if $a < b$

(b) if $a \leq b$

(c) if $a \geq b$

(d) if $a = b$

(e) if $a > b$

27. I $a^2 - 5a + 6 = 0$
II $b^2 - 3b + 2 = 0$
28. I $2a + 3b = 31$
II $3a = 2b + 1$
29. I $2a^2 + 5a + 3 = 0$
II $2b^2 - 5b + 3 = 0$

30. I. $4a^2 = 1$
 II. $4b^2 - 12b + 5 = 0$

Directions (Qs. 31-35): In each of the following questions there are two equations. Solve them and give answer

- (a) If $P < Q$ (b) If $P > Q$
 (c) If $P < Q$ (d) If $P \geq Q$
 (e) If $P = Q$
31. I. $4P^2 - 8P + 3 = 0$ II. $2Q^2 - 13Q + 15 = 0$
 32. I. $P^2 + 3P - 4 = 0$ II. $3Q^2 - 10Q + 8 = 0$
 33. I. $3P^2 - 10P + 7 = 0$ II. $15Q^2 - 22Q + 8 = 0$
 34. I. $20P^2 - 17P + 3 = 0$ II. $20Q^2 - 9Q + 1 = 0$
 35. I. $20P^2 + 31P + 12 = 0$ II. $21Q^2 + 23Q + 6 = 0$

Directions (Qs. 36-40): For the two given equations I and II, give answer

- (a) if a is greater than b
 (b) if a is smaller than b
 (c) if a is equal to b
 (d) if a is either equal to or greater than b
 (e) if a is either equal to or smaller than b
36. I. $\sqrt{2304} = a$
 II. $b^2 = 2304$
37. I. $12a^2 - 7a + 1 = 0$
 II. $15b^2 - 16b + 4 = 0$
38. I. $a^2 + 9a + 20 = 0$
 II. $2b^2 - 10b + 12 = 0$
39. I. $3a + 2b = 14$
 II. $a + 4b - 13 = 0$
40. I. $a^2 - 7a + 12 = 0$
 II. $b^2 - 9b + 20 = 0$

Directions (Qs. 41-45): In each question one or more equation(s) is (are) provided. On the basis of these you have Give answer (a) if $p = q$

- Give answer (b) if $p > q$
 Give answer (c) if $q > p$
 Give answer (d) if $p \geq q$ and
 Give answer (e) if $q \geq p$
41. (i) $\frac{5}{28} \times \frac{9}{8} p = \frac{15}{14} \times \frac{13}{16} q$
42. (i) $p - 7 = 0$ (ii) $3q^2 - 10q + 7 = 0$
 43. (i) $4p^2 = 16$ (ii) $q^2 - 10q + 25 = 0$
 44. (i) $4p^2 - 5p + 1 = 0$ (ii) $q^2 - 2q + 1 = 0$
 45. (i) $q^2 - 11q + 30 = 0$ (ii) $2p^2 - 7p + 6 = 0$

Directions (Qs. 46 - 48): In each question below one or more equation(s) is/are provided. On the basis of these, you have to find out relation between p and q .

- Give answer (a) if $p = q$, Give answer (b) if $p > q$, Give answer (c) if $q > p$, Give answer (d) if $p \geq q$ and Give answer (5) if $q \geq p$.
46. I. $4q^2 + 8q = 4q + 8$
 II. $p^2 + 9p = 2p - 12$
47. I. $2p^2 + 40 = 18p$
 II. $q^2 = 13q - 42$

48. I. $6q^2 + \frac{1}{2} = \frac{7}{2} q$
 II. $12p^2 + 2 = 10p$

Directions (Qs. 49-53): In each of the following questions two equations are given. You have to solve them and give answer

- (a) if $x > y$; (b) if $x < y$;
 (c) if $x = y$; (d) if $x \geq y$;
 (e) if $x \leq y$;
49. I. $y^2 - 6y + 9 = 0$ II. $x^2 + 2x - 3 = 0$
 50. I. $x^2 - 5x + 6 = 0$ II. $2y^2 + 3y - 5 = 0$
51. I. $x = \sqrt{256}$ II. $y = (-4)^2$
 52. I. $x^2 - 6x + 5 = 0$ II. $y^2 - 13y + 42 = 0$
 53. I. $x^2 + 3x + 2 = 0$ II. $y^2 - 4y + 1 = 0$
54. Which of the following expressions are different in value?
 (A) $(2x + 3y)^2$ (B) $(2x + y)^2 + 8y(x + y)$
 (C) $(2x - y)^2 - 8y(x + y)$ (D) $2^2(x + y)^2 + 4xy + 5y^2$
 (a) A and B (b) B and C only
 (c) A, B and D only (d) B and D only
 (e) All are different
55. Which of the following values of x will satisfy the inequality $2x^2 - 7x < 15$?
 (a) $\frac{3}{2} < x < 5$ (b) $x > 5$ or $x < -\frac{3}{2}$
 (c) $x < 5$ and $x < -\frac{3}{2}$ (d) $x > -\frac{3}{2}$ and $x > 5$
 (e) None of these
56. Which values of 'x' satisfies the inequality $x^2 - 3x + 2 > 2x - 4$?
 (a) $2 < x < 3$ (b) $x > 3$ or $x < 2$
 (c) $x \geq 3$ (d) $x \leq 2$
 (e) None of these
57. Which of the following values of x satisfies the inequality $2x^2 - 3x + 1 > 0$?
 (a) $-1 < x < -\frac{1}{2}$ (b) $\frac{1}{2} < x < 1$
 (c) $x > 1$ or $x < \frac{1}{2}$ (d) $-\frac{1}{2} < x < 1$
 (e) None of these
58. If $3x - 5y = 5$ and $\frac{x}{x+y} = \frac{5}{7}$, then what is the value of $x - y$?
 (a) 9 (b) 6
 (c) 4 (d) 3
 (e) None of these
59. Which of the following values of x will satisfy the inequality $x^2 - x - 6 > 0$?
 (a) $x < -2$ or $x > 3$ (b) $-2 < x < 3$
 (c) $-3 < x < 2$ (d) $x > -2$ or $x < 3$
 (e) None of these
60. $\frac{5}{7}$ of $\frac{4}{15}$ of a number is 8 more than $\frac{2}{5}$ of $\frac{4}{9}$ of the same number. What is half of that number?
 (a) 630 (b) 315
 (c) 210 (d) 105
 (e) None of these

61. The difference between a two-digit number obtained by interchanging the positions of its digits is 36. What is the difference between the two digits of that number?
 (a) 4 (b) 9
 (c) 3 (d) Cannot be determined
 (e) None of these
62. By how much is two-fifth of 200 greater than three-fifths of 125?
 (a) 15 (b) 3
 (c) 5 (d) 30
 (e) None of these
63. If $\frac{x^2 - 1}{x + 1} = 2$, then, $x = ?$
 (a) 1 (b) 0
 (c) 2 (d) Can't be determined
 (e) None of these
64. Which value of x does satisfy the inequality $2x^2 + x - 3 < 0$?
 (a) $-\frac{3}{2} < x < 1$ (b) $-1 < x < \frac{3}{2}$
 (c) $x > 1$ (d) $x < \frac{-2}{5}$
65. The difference between a number and its one-third is double of its one-third. What is the number?
 (a) 60 (b) 18
 (c) 30 (d) Cannot be determined
 (e) None of these
66. Two pens and three pencils cost ₹ 86. Four pens and a pencil cost ₹ 112. What is the difference between the cost of a pen and that of a pencil?
 (a) ₹ 25 (b) ₹ 13
 (c) ₹ 19 (d) Cannot be determined
 (e) None of these
67. The difference between a two-digit number and the number after interchanging the position of the two digits is 36. What is the difference between the two digits of the number?
 (a) 4 (b) 6
 (c) 3 (d) Cannot be determined
 (e) None of these
68. If the digit in the unit's place of a two-digit number is halved and the digit in the ten's place is doubled, the number thus obtained is equal to the number obtained by interchanging the digits. Which of the following is **definitely true**?
 (a) Digits in the unit's place and the ten's place are equal.
 (b) Sum of the digits is a two-digit number.
 (c) Digit in the unit's place is half of the digit in the ten's place.
 (d) Digit in the unit's place is twice the digit in the ten's place.
 (e) None of these
69. If A and B are positive integers such that $9A^2 = 12A + 96$ and $B^2 = 2B + 3$, then which of the following is the value of $5A + 7B$?
 (a) 31 (b) 41
 (c) 36 (d) 43
 (e) 27
70. On Children's Day, sweets were to be equally distributed among 175 children in a school. Actually on the Children's Day 35 children were absent and therefore, each child got 4 sweets extra. How many sweets were available in all for distribution?
 (a) 2480 (b) 2680
 (c) 2750 (d) 2400
 (e) None of these
71. A two-digit number is seven times the sum of its digits. If each digit is increased by 2, the number thus obtained is 4 more than six times the sum of its digits. Find the number.
 (a) 42 (b) 24
 (c) 48 (d) Data inadequate
 (e) None of these
72. One-third of Ramani's savings in National Savings Certificate is equal to one-half of his savings in Public Provident Fund. If he has ₹ 150000 as total savings, how much he saved in Public Provident Fund?
 (a) ₹ 60000 (b) ₹ 50000
 (c) ₹ 90000 (d) ₹ 30000
 (e) None of these
73. $\frac{1}{5}$ of a number is equal to $\frac{5}{8}$ of the second number. If 35 is added to the first number then it becomes 4 times of second number. What is the value of the second number?
 (a) 125 (b) 70
 (c) 40 (d) 25
 (e) None of these
74. In a two-digit number, the digit at unit place is 1 more than twice of the digit at tens place. If the digit at unit and tens place be interchanged, then the difference between the new number and original number is less than 1 to that of original number. What is the original number?
 (a) 52 (b) 73
 (c) 25 (d) 49
 (e) 37
75. Free notebooks were distributed equally among children of a class. The number of notebooks each child got was one-eighth of the number of children. Had the number of children been half, each child would have got 16 notebooks. How many notebooks were distributed in all?
 (a) 432 (b) 640
 (c) 256 (d) 512
 (e) None of these
76. Twenty times a positive integer is less than its square by 96. What is the integer?
 (a) 24 (b) 20
 (c) 30 (d) Cannot be determined
 (e) None of these
77. A man starts going for morning walk every day. The distance walked by him on the first day was 2 km. Everyday he walks half of the distance walked on the previous day. What can be the **maximum** total distance walked by him in his lifetime?
 (a) 4km (b) 20km
 (c) 8km (d) Data inadequate
 (e) None of these
78. The digit in the units place of a number is equal to the digit in the tens place of half of that number and the digit in the

- tens place of that number is less than the digit in units place of half of the number by 1. If the sum of the digits of the number is seven, then what is the number?
- (a) 52 (b) 16
(c) 34 (d) Data inadequate
(e) None of these
79. The difference between a two-digit number and the number obtained by interchanging the digits is 9. What is the difference between the two digits of the number?
- (a) 8 (b) 2
(c) 7 (d) Cannot be determined
(e) None of these
80. The difference between a number and its three-fifths is 50. What is the number?
- (a) 75 (b) 100
(c) 125 (d) Cannot be determined
(e) None of these
81. If the numerator of a fraction is increased by 2 and the denominator is increased by 1, the fraction becomes $\frac{5}{8}$ and if the numerator of the same fraction is increased by 3 and the denominator is increased by 1 the fraction becomes $\frac{3}{4}$. What is the original fraction?
- (a) Data inadequate (b) $\frac{2}{7}$
(c) $\frac{4}{7}$ (d) $\frac{3}{7}$
(e) None of these
82. If $2x + 3y = 26$; $2y + z = 19$ and $x + 2z = 29$, what is the value of $x + y + z$?
- (a) 18 (b) 32
(c) 26 (d) 22
(e) None of these
83. If the sum of a number and its square is 182, what is the number?
- (a) 15 (b) 26
(c) 28 (d) 91
(e) None of these
84. A certain number of tennis balls were purchased for ₹ 450. Five more balls could have been purchased for the same amount if each ball was cheaper by ₹ 15. Find the number of balls purchased.
- (a) 15 (b) 20
(c) 10 (d) 25
(e) None of these
85. What will be the value of $n^4 - 10n^3 + 36n^2 - 49n + 24$, if $n = 1$?
- (a) 21 (b) 2
(c) 1 (d) 22
(e) None of these
86. Out of total number of students in a college 12% are interested in sports. $\frac{3}{4}$ of the total number of students are interested in dancing. 10% of the total number of students are interested in singing and the remaining 15 students are not interested in any of the activities. What is the total number of students in the college?
- (a) 450 (b) 500
(c) 600 (d) Cannot be determined
(e) None of these
87. The sum of four numbers is 64. If you add 3 to the first number, 3 is subtracted from the second number, the third is multiplied by 3 and the fourth is divided by 3, then all the results are equal. What is the difference between the largest and the smallest of the original numbers?
- (a) 32 (b) 27
(c) 21 (d) Cannot be determined
(e) None of these
88. A classroom has equal number of boys and girls. Eight girls left to play Kho-kho, leaving twice as many boys as girls in the classroom. What was the total number of girls and boys present initially?
- (a) Cannot be determined (b) 16
(c) 24 (d) 32
(e) None of these
89. The difference between the digits of a two-digit number is one-ninth of the difference between the original number and the number obtained by interchanging positions of the digits. What definitely is the sum of digits of that number?
- (a) 5 (b) 14
(c) 12 (d) Data inadequate
(e) None of these
90. Assuming that A, B and C are different single-digit numerical values other than what is already used in following equation, what number C definitely cannot be?
 $8A2 + 3B5 + C4 = 1271$
- (a) 7 (b) 9
(c) Either 7 or 9 (d) 6
(e) None of these
91. The denominator of a fraction is 2 more than thrice its numerator. If the numerator as well as denominator is increased by one, the fraction becomes $\frac{1}{3}$. What was the original fraction?
- (a) $\frac{4}{13}$ (b) $\frac{3}{11}$
(c) $\frac{5}{13}$ (d) $\frac{5}{11}$
(e) None of these
92. If $2x + y = 15$, $2y + z = 25$ and $2z + x = 26$, what is the value of z ?
- (a) 4 (b) 7
(c) 9 (d) 12
(e) None of these

93. Which of the following values of P satisfy the inequality $P(P-3) < 4P-12$?
- (a) $P > 4$ or $P \leq 3$ (b) $24 \leq P < 71$
(c) $P > 13$; $P < 51$ (d) $3 < P < 4$
(e) $P = 4$, $P = +3$
94. If the ages of P and R are added to twice the age of Q , the total becomes 59. If the ages of Q and R are added to thrice the age of P , the total becomes 68. And if the age of P is added to thrice the age of Q and thrice the age of R , the total becomes 108. What is the age of P ?
- (a) 15 years (b) 19 years
(c) 17 years (d) 12 years
(e) None of these
95. The product of the ages of Harish and Seema is 240. If twice the age of Seema is more than Harish's age by 4 years, what is Seema's age in years?
- (a) 12 years (b) 20 years
(c) 10 years (d) 14 years
(e) Data inadequate
96. What would be the maximum value of Q in the following equation? $5P9 + 3R7 + 2Q8 = 1114$
- (a) 8 (b) 7
(c) 5 (d) 4
(e) None of the above
97. Two-fifths of one-fourth of three-sevenths of a number is 15. What is half of that number?
- (a) 96 (b) 196
(c) 94 (d) 188
(e) None of these
98. The sum of the digits of a two-digit number is $\frac{1}{11}$ of the sum of the number and the number obtained by interchanging the position of the digits. What is the difference between the digits of that number?
- (a) 3 (b) 2
(c) 6 (d) Data inadequate
(e) None of these
99. If a fraction's numerator is increased by 1 and the denominator is increased by 2 then the fraction becomes $\frac{2}{3}$. But when the numerator is increased by 5 and the denominator is increased by 1 then the fraction becomes $\frac{5}{4}$. What is the value of the original fraction?
- (a) $\frac{3}{7}$ (b) $\frac{5}{8}$
(c) $\frac{5}{7}$ (d) $\frac{6}{7}$
(e) None of these
100. In a two-digit number the digit in the unit's place is more than the digit in the ten's place by 2. If the difference between the number and the number obtained by interchanging the digits is 18 what is the original number?
- (a) 46 (b) 68
(c) 24 (d) Data inadequate
(e) None of these
101. If $2x + y = 17$, $2z = 15$ and $x + z = 9$ then what is the value of $4x + 3y + z$?
- (a) 41 (b) 43
(c) 55 (d) 45
(e) None of these
102. If the numerator of a fraction is increased by 2 and denominator is increased by 3, the fraction becomes $\frac{7}{9}$; and if numerator as well as denominator are decreased by 1 the fraction becomes $\frac{4}{5}$. What is the original fraction?
- (a) $\frac{13}{16}$ (b) $\frac{9}{11}$
(c) $\frac{5}{6}$ (d) $\frac{17}{21}$
(e) None of these
103. The inequality $3n^2 - 18n + 24 > 0$ gets satisfied for which of the following values of n ?
- (a) $n < 2$ & $n > 4$ (b) $2 < n < 4$
(c) $n > 2$ (d) $n > 4$
(e) None of these
104. A sum is divided among Rakesh, Suresh and Mohan. If the difference between the shares of Rakesh and Mohan is ₹7000 and between those of Suresh and Mohan is ₹3000, what was the sum?
- (a) ₹30,000 (b) ₹13,000
(c) ₹10,000 (d) Cannot be determined
(e) None of these
105. Three-fifths of a number is 30 more than 50 per cent of that number. What is 80 per cent of that number?
- (a) 300 (b) 60
(c) 240 (d) Cannot be determined
(e) None of these
106. The difference between a two-digit number and the number obtained by interchanging the position of the digits of the number is 27. What is the difference between the digits of that number?
- (a) 2 (b) 3
(c) 4 (d) Cannot be determined
(e) None of these
107. The sum of the ages of a father and his son is 4 times the age of the son. If the average age of the father and the son is 28 years, what is the son's age?
- (a) 14 years (b) 16 years
(c) 12 years (d) Data inadequate
(e) None of these
108. Two-fifths of one-fourth of five-eighths of a number is 6. What is 50 per cent of that number?
- (a) 96 (b) 32
(c) 24 (d) 48
(e) None of these
109. The sum of the digits of a two-digit number is $\frac{1}{5}$ of the difference between the number and the number obtained

- by interchanging the positions of the digits. What definitely is the difference between the digits of that number?
- (a) 5 (b) 9
(c) 7 (d) Data inadequate
(e) None of these
110. Ashok gave 40 per cent of the amount he had to Jayant. Jayant in turn gave one-fourth of what he received from Ashok to Prakash. After paying ₹ 200 to the taxi-driver out of the amount he got from Jayant, Prakash now has ₹ 600 left with him. How much amount did Ashok have?
- (a) ₹ 1,200 (b) ₹ 4,000
(c) ₹ 8,000 (d) Data inadequate
(e) None of these
111. What should be the maximum value of Q in the following equation?
 $5P9 - 7Q2 + 9R6 = 823$
- (a) 7 (b) 5
(c) 9 (d) 6
(e) None of these
112. The difference between a two-digit number and the number obtained by interchanging the position of the digits of that number is 54. What is the sum of the digits of that number?
- (a) 6 (b) 9
(c) 15 (d) Data inadequate
(e) None of these
113. The product of two numbers is 192 and the sum of these two numbers is 28. What is the smaller of these two numbers?
- (a) 16 (b) 14
(c) 12 (d) 18
(e) None of these
114. The age of Mr. Ramesh is four times the age of his son. After ten years the age of Mr. Ramesh will be only twice the age of his son. Find the present age of Mr. Ramesh's son.
- (a) 10 years (b) 11 years
(c) 12 years (d) Cannot be determined
(e) None of these
115. In an exercise room some discs of denominations 2 kg and 5 kg are kept for weightlifting. If the total number of discs is 21 and the weight of all the discs of 5 kg is equal to the weight of all the discs of 2 kg, find the weight of all the discs together.
- (a) 80 kg (b) 90 kg
(c) 56 kg (d) Cannot be determined
(e) None of these
116. If the number of barrels of oil consumed doubles in a 10-year period and if B barrels were consumed in the year 1940, what multiple of B will be consumed in the year 2000?
- (a) 64 (b) 60 (c) 12 (d) 32
(e) None of these
117. The sum of three consecutive even numbers is 14 less than one-fourth of 176. What is the middle number?
- (a) 8 (b) 10
(c) 6 (d) Data inadequate
(e) None of these
118. The price of four tables and seven chairs is ₹ 12,090. **Approximately**, what will be the price of twelve tables and twenty-one chairs?
- (a) ₹ 32,000 (b) ₹ 46,000
(c) ₹ 38,000 (d) ₹ 36,000
(e) ₹ 39,000
119. If the price of 253 pencils is ₹ 4263.05, what will be the **approximate** value of 39 such pencils?
- (a) ₹ 650 (b) ₹ 550
(c) ₹ 450 (d) ₹ 700
(e) ₹ 750
120. Sundari, Kusu and Jyoti took two tests each. Sundari secured $\frac{24}{60}$ marks in the first test and $\frac{32}{40}$ marks in the second test. Kusu secured $\frac{35}{70}$ marks in the first test and $\frac{54}{60}$ marks in the second test. Jyoti secured $\frac{27}{90}$ marks in the first test and $\frac{45}{50}$ marks in the second test. Who among them did register maximum progress?
- (a) Only Sundari (b) Only Kusu
(c) Only Jyoti (d) Both Sundari and Kusu
(e) Both Kusu and Jyoti

ANSWER KEY

1	(c)	14	(d)	27	(c)	40	(e)	53	(b)	66	(b)	79	(e)	92	(e)	105	(c)	118	(a)
2	(b)	15	(b)	28	(a)	41	(b)	54	(b)	67	(a)	80	(c)	93	(d)	106	(b)	119	(c)
3	(b)	16	(a)	29	(a)	42	(b)	55	(a)	68	(d)	81	(d)	94	(d)	107	(a)	120	(d)
4	(e)	17	(d)	30	(b)	43	(c)	56	(b)	69	(b)	82	(e)	95	(a)	108	(d)		
5	(a)	18	(c)	31	(c)	44	(e)	57	(c)	70	(e)	83	(c)	96	(e)	109	(c)		
6	(b)	19	(b)	32	(a)	45	(c)	58	(d)	71	(a)	84	(b)	97	(e)	110	(a)		
7	(a)	20	(a)	33	(b)	46	(c)	59	(a)	72	(a)	85	(b)	98	(d)	111	(d)		
8	(d)	21	(d)	34	(b)	47	(c)	60	(d)	73	(c)	86	(a)	99	(c)	112	(c)		
9	(c)	22	(a)	35	(b)	48	(d)	61	(a)	74	(e)	87	(d)	100	(d)	113	(e)		
10	(e)	23	(e)	36	(c)	49	(b)	62	(c)	75	(d)	88	(d)	101	(d)	114	(e)		
11	(a)	24	(b)	37	(b)	50	(a)	63	(e)	76	(a)	89	(d)	102	(c)	115	(a)		
12	(c)	25	(c)	38	(b)	51	(c)	64	(a)	77	(a)	90	(e)	103	(a)	116	(b)		
13	(b)	26	(b)	39	(a)	52	(b)	65	(d)	78	(a)	91	(b)	104	(d)	117	(d)		

ANSWERS & EXPLANATIONS

1. (c) I. $pq + 30 = 6p + 5q$
 or, $(6p - 30) + (5q - pq) = 0$
 or, $6(p - 5) - q(p - 5) = 0$
 or, $(p - 5)(6 - q) = 0$
 $\therefore p = 5$
 or, $q = 6$
 Hence, $q > p$
2. (b) I. $2p^2 - 12p + 16 = 0$
 II. $2q^2 + 14q + 24 = 0$
 or, $p^2 - 6p + 8 = 0$
 or, $(p - 4)(p - 2) = 0$
 or, $q^2 + 7q + 12 = 0$
 or, $(q + 4)(q + 3) = 0$
 $p = +4$ or, $+2$
 $\therefore q = -3$ or, -4
 When $p = +2$, $q = -3$, then, $p > q$
 When $p = +4$, $q = -4$, then, $p > q$
 When $p = +4$, $q = -3$, then, $p > q$
 Hence $p > q$
3. (b) I. $2p^2 - 20p + 48 = 0$
 $p^2 - 10p + 24 = 0$
 $(p - 4)(p - 6) = 0$
 or $p = 4$; $p = 6$
 II. $2q^2 - 12q + 18 = 0$
 $q^2 - 6q + 9 = 0$
 $(q - 3)(q - 3) = 0$
 or $q = 3$; $q = 3$
 hence $p > q$
4. (e) I. $q^2 + q = 2$
 or, $q^2 + q - 2 = 0$
 II. $p^2 + 7p + 10 = 0$
 or, $p^2 + 5p + 2p + 10 = 0$
 or, $(q + 2)(q - 1) = 0$
 or, $(q + 5)(p + 2) = 0$
 $\therefore q = -2$ or 1
 $\therefore p = -5$ or -2
 Hence, $q \geq p$
5. (a) I. $p^2 + 36 = 12p$
 or, $p^2 - 12p + 36 = 0$
 II. $4q^2 + 144 = 48q$
 or, $(p - 6)^2 = 0$
 or, $q^2 - 12q + 36 = 0$
 $\therefore p = 6$
 or, $(q - 6)^2 = 0$
 $\therefore q = 6$
 Hence, $p = q$
6. (b) I. $6p^2 + 5p + 1 = 0$
 or, $6p^2 + 3p + 2p + 1 = 0$
 or, $3p(2p + 1) + 1(2p + 1) = 0$
 or, $(3p + 1)(2p + 1) = 0$
 Hence, $p = \frac{-1}{3}, \frac{-1}{2}$
 II. $20q^2 + 9q + 1 = 0$
 or, $20q^2 + 5q + 4q + 1 = 0$
 or, $5q(4q + 1) + 1(4q + 1) = 0$
 or, $(5q + 1)(4q + 1) = 0$
 Hence, $q = \frac{-1}{5}, \frac{-1}{4}$ Thus, $p < q$.
7. (a) I. $3p^2 + 2p - 1 = 0$
 or, $3p^2 + 3p - p - 1 = 0$
 or, $3p(p + 1) - 1(p + 1) = 0$
 or, $(3p - 1)(p + 1) = 0$

Therefore, $p = \frac{1}{3}, -1$

II. $2q^2 + 7q + 6 = 0$

or, $2q^2 + 4q + 3q + 6 = 0$

or, $2q(q+2) + 3(q+2) = 0$

or, $(2q+3)(q+2) = 0$

Therefore, $q = \frac{-3}{2}, -2$ Thus $p > q$

8. (d) **I.** $3p^2 + 15p + 18 = 0$

or, $3p^2 + 9p + 6p + 18 = 0$

or, $3p(p+3) + 6(p+3) = 0$

or, $(3p+6)(p+3) = 0$

or, $p = \frac{-6}{3}, -3 = -2, -3$

II. $q^2 + 7q + 12 = 0$

or, $q^2 + 4q + 3q + 12 = 0$

or, $q(q+4) + 3(q+4) = 0$

or, $(q+3)(q+4) = 0$

or, $q = -3, -4$

Therefore, $p \geq q$

9. (c) **I.** $p = \frac{\sqrt{4}}{\sqrt{9}} = \frac{2}{3}$

II. $9q^2 - 12q + 4 = 0$

or, $9q^2 - 6q - 6q + 4 = 0$

or, $3q(3q-2) - 2(3q-2) = 0$

or, $(3q-2)(3q-2) = 0$

or, $q = \frac{2}{3}$

Therefore, $p = q$

10. (e) **I.** $p^2 + 13p + 42 = 0$

or, $p^2 + 7p + 6p + 42 = 0$

or, $p(p+7) + 6(p+7) = 0$

or, $(p+6)(p+7) = 0$

or, $p = -6, -7$

II. $q^2 = 36$

$q = \sqrt{36}$

$\therefore q = +6, -6$

Therefore, $p \leq q$

11. (a) **I.** $x^2 + 3x + 2 = 0$

or, $x^2 + 2x + x + 2 = 0$

or, $(x+2)(x+1) = 0$

or, $x = -2, -1$

II. $2y^2 = 5y$

or, $2y^2 - 5y = 0$

or, $y(2y-5) = 0$

or, $y = 0, \frac{5}{2}$

Hence, $y > x$

12. (c) **I.** $2x^2 + 5x + 2 = 0$

or, $2x^2 + 4x + x + 2 = 0$

or, $(x+2)(2x+1) = 0$

or, $x = -2, -\frac{1}{2}$

II. $4y^2 = 1$

or, $y^2 = \frac{1}{4}$

or, $y = \pm \frac{1}{2}$

Hence, $y \geq x$

13. (b) **I.** $y^2 + 2y - 3 = 0 \Rightarrow (y-1)(y+3) = 0$

or, $y = 1, -3$

II. $2x^2 - 7x + 6 = 0$

or, $2x^2 - 4x - 3x + 6 = 0$

or, $(2x-3)(x-2) = 0$

or, $x = 2, \frac{3}{2}$

Hence, $x > y$

14. (d) **I.** $x^2 - 5x + 6 = 0$

or, $x^2 - 3x - 2x + 6 = 0$

or, $x(x-3) - 2(x-3) = 0$

or, $(x-3)(x-2) = 0$

or, $x = 2, 3$

II. $y^2 + y - 6 = 0$

or, $y^2 + 3y - 2y - 6 = 0$

or, $y(y+3) - 2(y+3) = 0$

or, $(y+3)(y-2) = 0$

or, $y = 2, -3$

Hence, $x \geq y$

15. (b) **I.** $p^2 - 7p = -12$

or, $p^2 - 7p + 12 = 0$

or, $(p-3)(p-4) = 0$

or, $p = 3$ or 4

II. $q^2 - 3q + 2 = 0$

or, $(q-2)(q-1) = 0$

or, $q = 1$ or 2

Hence, $p > q$

16. (a) **I.** $12p^2 - 7p = -1$

or, $12p^2 - 7p + 1 = 0$

or, $(3p-1)(4p-1) = 0$

or, $p = \frac{1}{4}$ or $\frac{1}{3}$

II. $6q^2 - 7q + 2 = 0$

or, $(3q-2)(2q-1) = 0$

or, $q = \frac{1}{2}$ or $\frac{2}{3}$

Hence, $q > p$

17. (d) I. $p^2 - 8p + 15 = 0$
 or, $(p-3)(p-5) = 0$
 or, $p = 3$ or 5
 II. $q^2 - 5q + 6 = 0$
 or, $(q-2)(q-3) = 0$
 or, $q = 2$ or 3
 Hence, $p \geq q$
18. (c) I. $2p^2 + 20p + 50 = 0$
 or, $p^2 + 10p + 25 = 0$
 or, $(p+5)^2 = 0$
 or, $p = -5$
 II. $q^2 = 25$
 or, $q = \pm 5$
 Hence, $p \leq q$
19. (b) I. $x^2 - 6x = 7$
 or, $x^2 - 6x - 7 = 0$
 or, $(x-7)(x+1) = 0$
 or, $x = 7, -1$
 II. $2y^2 + 13y + 15 = 0$
 or, $2y^2 + 3y + 10y + 15 = 0$
 or, $(2y+3)(y+5) = 0$ or, $y = \frac{-3}{2}, -5$
 Hence, $x > y$
20. (a) I. $3x^2 - 7x + 2 = 0$
 or, $3x^2 - 6x - x + 2 = 0$
 or, $(x-2)(3x-1) = 0$
 or, $x = 2, 1/3$
 II. $2y^2 - 11y + 15 = 0$
 or, $2y^2 - 6y - 5y + 15 = 0$
 or, $(2y-5)(y-3) = 0$
 or, $y = 5/2, 3$
 Hence, $y > x$
21. (d) I. $10x^2 - 7x + 1 = 0$
 or, $10x^2 - 5x - 2x + 1 = 0$
 or, $(2x-1)(5x-1) = 0$
 or, $x = 1/2, 1/5$
 II. $35y^2 - 12y + 1 = 0$
 or, $35y^2 - 7y - 5y + 1 = 0$
 or, $(5y-1)(7y-1) = 0$
 or, $y = \frac{1}{5}, \frac{1}{7}$
 Hence, $x \geq y$
22. (a) I. $4x^2 = 25$
 or, $x = \pm \frac{5}{2}$
 II. $2y^2 - 13y + 21 = 0$
 or, $2y^2 - 6y - 7y + 21 = 0$
 or, $(y-3)(2y-7) = 0$
 or, $y = 3, \frac{7}{2}$
- Hence, $y > x$
23. (e) I. $3x^2 + 7x - 6 = 0$
 or, $3x^2 + 9x - 2x - 6 = 0$
 or, $(x+3)(3x-2) = 0$
 or, $x = -3, \frac{2}{3}$
 II. $6(2y^2 + 1) = 17y$
 or, $12y^2 + 6 - 17y = 0$
 or, $12y^2 - 9y - 8y + 6 = 0$
 or, $(4y-3)(3y-2) = 0$
 or, $y = \frac{3}{4}, \frac{2}{3}$
 Hence, $y \geq x$
24. (b) I. $2p^2 = 23p - 63$
 or, $2p^2 - 23p + 63 = 0$
 II. $2q(q^8) = q^{-36}$
 or, $(2p-9)(p-7) = 0$
 or, $q^{-7} \times q^{36} = \frac{1}{2}$
 $\therefore p = \frac{9}{2}$ or 7
 or, $q^{29} = \frac{1}{2}$
 $\therefore q = \left(\frac{1}{2}\right)^{1/29}$
 Hence, $p > q$
25. (c) I. $p(p^{-1}) = p^{-1}$
 II. $q^2 = 4(q^{-1})$
 or, $p \times \frac{1}{p} = \frac{1}{p}$
 $\therefore p = 1$
 or, $q^3 = 4$
 $\therefore q = (4)^{1/3} > 1$
 Hence, $q > p$
26. (b) I. $2p(p-4) = 8(p+5)$
 or, $p^2 - 8p - 20 = 0$
 or, $(p+2)(p-10) = 0$
 $\Rightarrow p = -2, \text{ or } +10$
 II. $q^2 + 7q + 12 = 0$
 $(q+3)(q+4) = 0$
 $q = -3 \text{ or } -4$
 $p > q$
27. (c) For eqn I, the roots (a) will be 2, 3. As $-2 \times -3 = 6$ (ac) and $(-2) + (-3) = -5$
 (b). Similarly, for eqn II, the roots (b) will be 2, 1.
28. (a) $2a + 3b = 31$... (i)
 $3a - 2b = 1$..(ii)

Multiply (i) by 2 and (ii) by 3 and then adding

(i) and (ii), we get $a = \frac{65}{13} = 5$. Putting the value of 'a'

in any equation, we get $b = 7$.

Hence, $b > a$ or $a < b$.

29. (a) $a = -3/2$ & -1 ; $b = \frac{3}{2}$ & 1

30. (b) $a = \pm 1/2$; $b = 1/2, 5/2$

31. (c) **I** $4P^2 - 8P + 3 = 0$
 $4P^2 - 2P - 6P + 3 = 0$
 $2P(2P - 1) - 3(2P - 1) = 0$
 $(2P - 3)(2P - 1) = 0$
 $\Rightarrow P = 1/2, 3/2$

II $2Q^2 - 13Q + 15 = 0$
 $2Q^2 - 10Q - 3Q + 15 = 0$
 $2Q(Q - 5) - 3(Q - 5) = 0$
 $\Rightarrow (2Q - 3)(Q - 5) = 0$
 $\Rightarrow Q = 3/2, 5$

$\therefore Q \geq P$

32. (a) **I** $P^2 + 3P - 4 = 0$
 $P^2 + 4P - P - 4 = 0$
 $\Rightarrow P(P + 4) - 1(P + 4) = 0$
 $\Rightarrow P = 1, -4$

II $3Q^2 - 10Q + 8 = 0$
 $3Q^2 - 6Q - 4Q + 8 = 0$
 $3Q(Q - 2) - 4(Q - 2) = 0$
 $(3Q - 4)(Q - 2) = 0$
 $\Rightarrow Q = 4/3, 2$

$\therefore Q > P$

33. (b) **I** $3P^2 - 10P + 7 = 0$
 $3P^2 - 3P - 7P + 7 = 0$
 $3P(P - 1) - 7(P - 1) = 0$
 $\Rightarrow (3P - 7)(P - 1) = 0$
 $\Rightarrow P = 7/3, 1$

II $15Q^2 - 22Q + 8 = 0$
 $15Q^2 - 10Q - 12Q + 8 = 0$
 $5Q(3Q - 2) - 4(3Q - 2) = 0$
 $(5Q - 4)(3Q - 2) = 0$
 $\Rightarrow Q = \frac{4}{5}, \frac{2}{3}$

$\therefore P > Q$

34. (b) **I** $20P^2 - 17P + 3 = 0$
 $20P^2 - 12P - 5P + 3 = 0$
 $5P(4P - 1) - 3(4P - 1) = 0$
 $\Rightarrow P = 3/5, 1/4$

II $20Q^2 - 9Q + 1 = 0$
 $20Q^2 - 4Q - 5Q + 1 = 0$
 $4Q(5Q - 1) - 1(5Q - 1) = 0$
 $(4Q - 1)(5Q - 1) = 0$
 $\Rightarrow Q = 1/4, 1/5$
 $\therefore P \geq Q$

35. (b) **I** $20P^2 + 31P + 12 = 0$
 $20P^2 + 16P + 15P + 12 = 0$
 $5P(4P + 3) + 4(4P + 3) = 0$

$\therefore P = -4/5, -\frac{3}{4}$

II $21Q^2 + 23Q + 6 = 0$
 $21Q^2 + 14Q + 9Q + 6 = 0$
 $7Q(3Q + 2) + 3(3Q + 2) = 0$
 $(7Q + 3)(3Q + 2) = 0$
 $\Rightarrow Q = -3/7, -2/3$
 $\therefore Q > P$

36. (c) **From I:**

If $\sqrt{2304} = a$

then $a = \pm 48$

(Do not consider -48 as value of a)

Again,

From II:

If $b^2 = 2304$ then $b = \pm 48$

Hence $a = b$.

37. (b) **I** $12a^2 - 7a + 1 = 0$

II $15b^2 - 16b + 4 = 0$

Sum of the two values of a , i.e., $(a_1 + a_2)$

$= \frac{-(-7)}{12} = \frac{7}{12}$

Similarly,

Sum of the two values of b ,

i.e., $(b_1 + b_2) = \frac{-(-16)}{15} = \frac{16}{15}$

Since $\frac{7}{12} < \frac{16}{15}$

Therefore, $a < b$,

Now check the equality of root

$(12 \times 4 - 15 \times 1)^2 = \{12 \times (-16) - 15 \times (-7)\}$

$\{(-7) \times 4 - (-16) \times 1\}$

$\Rightarrow 33^2 = \{-87\} \{-12\}$

$\Rightarrow 1089 = 1044$, which is not true.

Therefore, our answer should be $a < b$.

38. (b) **I** $a^2 + 9a + 20 = 0$

Break 9 as F_1 and F_2 , so that $F_1 \times F_2 = 20$ and $F_1 + F_2 = 9$.

Therefore, $F_1 = 5, F_2 = 4$

Now one value of $a = \frac{-5}{1} = -5$

other value of $a = \frac{-20}{5} = -4$

II $2b^2 + 10b + 12 = 0$

The two parts of 10, ie $F_1 = 6$ and $F_2 = 4$

\therefore Value of $b = \frac{-6}{2} = -3$ and $\frac{-12}{6} = -2$

Obviously $b > a$.

If general form of quadratic equation is

$$ax^2 + bx + c = 0,$$

then split b into two parts so that $b_1 + b_2 = b$ and

$$b_1 \times b_2 = a \times c$$

Now say b_1 as F_1 and b_2 as F_2 . Then the values

of 'x' will be $\frac{-F_1}{a}$ and $\frac{-F_2}{a}$ or

$$\frac{-F_1}{a} \text{ and } \frac{-F_2}{a}$$

39. (a) **I** $3a + 2b = 14$

II $a + 4b = 13$

Subtract equation I from equation II after multiplying II by 3.

We get $3a + 12b - 3a - 2b = 39 - 14$

$\Rightarrow 10b = 25$

$\Rightarrow b = 2.5$

Put value of b in equation II. We set $a + 4 \times 2.5 = 13$.

Therefore, $a = 3$. Thus, $a > b$

40. (e) **I** $a^2 - 7a + 12 = 0$

Here, $F_1 = -4$ and $F_2 = -3$

Now, values of $a = \frac{-(-4)}{1} = 4$

and $\frac{-12}{-4} = 3$

II $b^2 - 9b + 20 = 0$

Here $F_1 = -5$ and $F_2 = -4$

Now, values of $a = \frac{-(-5)}{1} = 5$

and $\frac{-20}{-5} = 4$

Thus $b \geq a$.

41. (b) $\frac{5}{28} \times \frac{9}{8} p = \frac{15}{14} \times \frac{13}{16} q$

or, $\frac{45p}{224} = \frac{195q}{224}$

or, $3p = 13q$

$\therefore p > q$

42. (b) (i) $p - 7 = 0$ or, $p = 7$

(ii) $3q^2 - 10q + 7 = 0$

or, $3q^2 - 3q - 7q + 7 = 0$

or, $3q(q - 1) - 7(q - 1) = 0$

or, $(3q - 7)(q - 1)$ or, $q = 1$ or, $\frac{7}{3}$

$\therefore p > q$

43. (c) (i) $4p^2 = 16; p = \sqrt{4} = 2$

(ii) $q^2 - 10q + 25 = 0 \Rightarrow (q - 5)(q - 5) = 0$
or, $q = 5 \therefore q > p$

44. (e) (i) $4p^2 - 5p + 1 = 0$ or, $4p^2 - 4p - p + 1 = 0$

or, $4p(p - 1) - 1(p - 1) = 0$

or, $(4p - 1)(p - 1) = 0$

or, $p = 1$ and $p = \frac{1}{4}$

(ii) $q^2 - 2q + 1 = 0$
 $\Rightarrow (q - 1)(q - 1) = 0$

or, $q = 1$

$\therefore q \geq p$

45. (c) $q = 5, 6$ & $p = \frac{3}{2}, 2$

46. (c) **I.** $4q^2 + 8q = 4q + 8$

or, $q^2 + q - 2 = 0$

or, $(q - 1)(q + 2) = 0$

$\therefore q = 1$ or -2

Hence, $q > p$

47. (c) **I.** $2p^2 + 40 = 18p$

or, $p^2 - 9p + 20 = 0$

or, $(p - 4)(p - 5) = 0$

$\therefore p = 4$ or 5

Hence, $q > p$

II. $p^2 + 9p = 2p - 12$

or, $p^2 + 7p + 12 = 0$

or, $(p + 3)(p + 4) = 0$

$\therefore p = -3$ or -4

48. (d) **I.** $6q^2 + \frac{1}{2} = \frac{7}{2}q$

or, $12q^2 - 7q + 1 = 0$

or $\left(q - \frac{1}{4}\right)\left(q - \frac{1}{3}\right) = 0$

$\therefore q = \frac{1}{4}$ or $\frac{1}{3}$

Hence, $p \geq q$

49. (b) **I** $y^2 - 6y + 9 = 0$

or, $(y - 3)^2 = 0$ or, $y = 3$

II. $x^2 + 2x - 3 = 0$ or, $x = 1, -3$

Hence, $y > x$

50. (a) **I** $x^2 - 5x + 6 = 0$

or, $(x - 3)(x - 2) = 0$ or, $x = 2, 3$

II. $2y^2 - 3y - 5 = 0$

or, $y = 1, -\frac{5}{2}$

Hence, $x > y$

51. (c) **I** $x = \sqrt{256} = 16$

II. $y = (-4)^2 = 16$

Hence, $x = y$

52. (b) **I** $x^2 - 6x + 5 = 0$ or, $x = 1, 5$

II. $y^2 - 13y + 42 = 0$

or, $(y - 7)(y - 6) = 0$ or, $y = 6, 7$

Hence, $y > x$

53. (b) I $x^2 + 3x + 2 = 0$
 or, $(x+2)(x+1) = 0$
 or, $x = -2$ or, -1
- II. $y^2 - 4y + 1 = 0$ or, $y = 2 \pm \sqrt{3}$
 Hence, $y > x$
54. (b) All others are equal except (C).
55. (a) $2x^2 - 7x < 15$
 or, $2x^2 - 7x - 15 < 0$
 or, $2x^2 - 10x + 3x - 15 < 0$
 or, $2x(x-5) + 3(x-5) < 0$
 or, $(x-5)(2x+3) < 0$
- |-----|-----
- +ve $-\frac{3}{2}$ -ve 5 +ve
- $-\frac{3}{2} < x < 5$
56. (b) Given expression is
 $x^2 - 3x + 2 - 2x + 4 > 0$ or, $x^2 - 5x + 6 > 0$
 or, $x^2 - 3x - 2x + 6 > 0$
 or, $x(x-3) - 2(x-3) > 0$ or, $(x-3)(x-2) > 0$
 or, $x > 3$ or, $x < 2$
57. (c) $2x^2 - 3x + 1 = 0$.
 or $(2x-1)(x-1) = 0$
- Hence, $\alpha = \frac{1}{2}$ and $\beta = 1$
- Now, the given inequality is $2x^2 - 3x + 1 > 0$,
 Hence, sign scheme will be as follows:
- |-----|-----
- +ve $\frac{1}{2}$ -ve 1 +ve
- $\therefore x < \frac{1}{2}$ or $x > 1$
- [Note: If the inequality were $2x^2 - 3x + 1 < 0$; the answer will be $\frac{1}{2} < x < 1$]
58. (d) $3x - 5y = 5$... (i)
- And $\frac{x}{x+y} = \frac{5}{7} \Rightarrow 7x = 5x + 5y$
 $\Rightarrow 2x = 5y$... (ii)
- From (i) and (ii), $x = 5$ and $y = 2$
 $\therefore x - y = 3$
59. (a) $x^2 - x - 6 > 0$
 or, $x^2 - 3x + 2x - 6 > 0$
 or, $x(x-3) + 2(x-3) > 0$
 or, $(x-3)(x+2) > 0$
 or, $x = 3$ or -2
 $\therefore x < -2$ or $x > 3$
60. (d) Let the number be x .
 $\therefore \frac{5}{7} \times \frac{4}{15} \times x - \frac{2}{5} \times \frac{4}{9} \times x = 8$
 or, $x = \frac{8 \times 315}{12} = 210$
 \therefore Half of the number = 105
61. (a) Let the two-digit number be $10x + y$.
 Then, $(10x + y) - (10y + x) = 36$
 or, $x - y = 4$
62. (c) Reqd no. = $\frac{2}{5} \times 200 - \frac{3}{5} \times 125$
 $= 80 - 75 = 5$
63. (e) $(x-1) = 2 \Rightarrow x = 3$
64. (a) $2x^2 + x - 3 < 0$
 $\Rightarrow (x-1)(2x+3) < 0$ or, $-\frac{3}{2} < x < 1$
65. (d) Let the no. be x .
 Then, $x - \frac{x}{3} = \frac{2}{3}x$
 or, $\frac{2}{3}x = \frac{2}{3}x$
 So, can't be determined is the correct choice.
66. (b) Let the cost of a pen and a pencil be ₹ 'x' and ₹ 'y' respectively. We have to find $(x - y)$.
 From the question,
 $2x + 3y = 86$ (i)
 $4x + y = 112$ (ii)
 Subtracting (i) from (ii), we get
 $2x - 2y = 26$ or, $x - y = 13$
67. (a) Let the two-digit no. be $10x + y$.
 Then, $(10x + y) - (10y + x) = 36$
 or, $9(x - y) = 36$
 or, $x - y = 4$
68. (d) Suppose the two-digit number is
 $10x + y$
 Then, $10y + x = 20x + y/2$
 or $20y + 2x = 40x + y$ or, $y = 2x$
69. (b) $9A^2 = 12A + 96 \Rightarrow 3A^2 - 4A - 32 = 0$
 $\therefore A = \frac{4 \pm \sqrt{16 + 384}}{6} = 4, -\frac{8}{3}$
 $B^2 = 2B + 3 \Rightarrow B^2 - 2B - 3 = 0$
 $\therefore B = \frac{2 \pm \sqrt{4 + 12}}{2} = 3, -1$
 $\therefore 5A + 7B = 5 \times 4 + 7 \times 3 = 20 + 21 = 41$
70. (e) Let the original number of sweets be x .
 According to the question,

$$\frac{x}{140} - \frac{x}{175} = 4$$

or, $175x - 140x = 4 \times 140 \times 175$

or, $x = \frac{4 \times 140 \times 175}{35} = 2800$

71. (a) Let the two-digit number be $10x + y$.

$$10x + y = 7(x + y) \Rightarrow x = 2y \dots (i)$$

$$10(x + 2) + y + 2 = 6(x + y + 4) + 4$$

or $10x + y + 22 = 6x + 6y + 28 \Rightarrow 4x - 5y = 6 \dots (ii)$

Solving equations (i) and (ii), we get $x = 4$ and $y = 2$

72. (a) Ratio of Ramani's savings in NSC and PPF = 3 : 2

His savings in PPF = $\frac{2}{5} \times 150000 = 60000$

73. (c) Let x be the first number and y be the second number.

$$\frac{1}{5}x = \frac{5}{8}y \quad \therefore \frac{x}{y} = \frac{25}{8} \quad \dots (i)$$

$$x + 35 = 4y \quad \text{or, } \frac{25}{8}y + 35 = 4y$$

$\therefore y = 40$

74. (e) Let the original number be $10x + y$

$$y = 2x + 1 \dots (i)$$

and $(10y + x) - (10x + y) = 10x + y - 1$

or, $9y - 9x = 10x + y - 1$

or, $19x - 8y = 1 \dots (ii)$

Putting the value of (i) in equation (ii) we get,

$$19x - 8(2x + 1) = 1$$

or, $19x - 16x - 8 = 1$

or, $3x = 9$ or, $x = 3$

So, $y = 2 \times 3 + 1 = 7$

\therefore original number = $10 \times 3 + 7 = 37$

75. (d) **In case I:** Let the no. of children = x .

Hence, total no. of notebooks distributed

$$\frac{1}{8} \cdot x \cdot x \text{ or } \frac{x^2}{8} \quad \dots (i)$$

In case II: no. of children = $\frac{x}{2}$

Now, the total no. of notebooks

$$= 16 \times \frac{x}{2} \quad \dots (ii)$$

Comparing (i) & (ii), we get

$$\frac{x^2}{8} = 8x$$

or, $x = 64$

Hence, total no. of notebooks

$$= \frac{64 \times 64}{8} = 512$$

76. (a) Let the positive integer be x .

Now, $x^2 - 20x = 96$

or, $x^2 - 20x - 96 = 0$

or, $x^2 - 24x + 4x - 96 = 0$

or, $x(x - 24) + 4(x - 24) = 0$

or, $(x - 24)(x + 4) = 0$

or, $x = 24, -4$

$x \neq -4$ because x is a positive integer

77. (a) Distance walked by man

$$= 2 + 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} \dots \infty$$

The above series is in infinity GP.

$$S_{\infty} = \frac{2}{1 - \frac{1}{2}} = 4 \text{ km}$$

Note: If the series is in GP then

$$\frac{\text{second term}}{\text{first term}} = \frac{\text{third term}}{\text{second term}} \dots = \text{Common ratio}$$

$$\text{Sum of the Infinity GP} = \frac{\text{first term}}{|1 - \text{common ratio}|}$$

78. (a) Let $\frac{1}{2}$ of the no. = $10x + y$

and the no. = $10V + W$ From the given conditions,

$W = x$ and $V = y - 1$

Thus the no. = $10(y - 1) + x \dots (A)$

$\therefore 2(10x + y) = 10(y - 1) + x \Rightarrow 8y - 19x = 10 \dots (i)$

Again, from the question,

$V + W = 7 \Rightarrow y - 1 + x = 7$

$\therefore x + y = 8 \dots (ii)$

Solving equations (i) and (ii), we get $x = 2$ and $y = 6$.

\therefore From equation ((A), Number = $10(y - 1) + x = 52$

79. (e) Suppose the two-digit number be $10x + y$.

Then we have been given

$$10x + y - (10y + x) = 9$$

$\Rightarrow 9x - 9y = 9$

$\Rightarrow x - y = 1$

Hence, the required difference = 1

Note that if the difference between a two-digit number and the number obtained by interchanging the digits is D , then the difference between the two digits of the

$$\text{number} = \frac{D}{9}$$

80. (c) Suppose the number is N .

Then $N - \frac{3}{5}N = 50$

$$\Rightarrow \frac{2N}{5} = 50, \therefore N = \frac{50 \times 5}{2} = 125$$

81. (d) Let the original fraction be $\frac{x}{y}$.

$$\text{Then } \frac{x+2}{y+1} = \frac{5}{8} \text{ or, } 8x - 5y = -11 \dots\dots(i)$$

$$\text{Again, } \frac{x+3}{y+1} = \frac{3}{4} \text{ or, } 4x - 3y = -9 \dots\dots(ii)$$

Solving, (i) and (ii) we get $x = 3$ and $y = 7$

$$\therefore \text{ fraction} = \frac{3}{7}$$

82. (d) On solving equation we get
 $x = 7, y = 4, z = 11$

83. (e) Let the number = x

$$\text{Then, } x^2 + x = 182$$

$$\text{or, } x^2 + x - 182 = 0$$

$$\text{or, } x^2 + 14x - 13x - 182 = 0$$

$$\text{or, } x(x + 14) - 13(x + 14) = 0$$

$$\text{or, } (x - 13)(x + 14) = 0$$

$$\text{or, } x = 13 \text{ (negative value is neglected)}$$

84. (c) Let the no. of balls = b

$$\text{Rate} = \frac{450}{b}$$

$$(b + 5) \left(\frac{450}{b} - 15 \right) = 450$$

$$\text{or, } 450 - 15b + \frac{2250}{b} - 75 = 450$$

$$\text{or, } b^2 + 5b - 150 = 0$$

$$\text{or, } (b + 15)(b - 10) = 0$$

$$\text{or, } b = 10 \text{ (Neglecting negative value)}$$

85. (b) $n^4 - 10n^3 + 36n^2 - 49n + 24$

$$1 - 10 + 36 - 49 + 24 = 2$$

86. (b) Let 'x' be the total number of students in college

$$x - \left[\frac{12x}{100} + \frac{3x}{4} + \frac{10x}{100} \right] = 15$$

$$x - \left[\frac{48x + 300x + 40x}{400} \right] = 15 \therefore x = 500$$

87. (a) Let the first, second, third and fourth numbers be a, b, c and d respectively.

According to the question,

$$a + b + c + d = 64 \dots\dots(i)$$

$$\text{and } a + 3 = b - 3 = 3c = \frac{d}{3}$$

$$\text{i.e., } a + 3 = b - 3 \Rightarrow b = a + 6 \dots\dots(ii)$$

$$\text{Also, } c = \frac{a+3}{3} \text{ and } d = 3(a+3)$$

Solving the above eqns, we get

$$a = 9, b = 15, c = 4 \text{ and } d = 36$$

\therefore Difference between the largest and the smallest numbers = $36 - 4 = 32$

88. (d) Let the no. of boys and girls in the classroom is x each.
From the question,

$$2(x - 8) = x \quad \therefore x = 16$$

\therefore Number of boys and girls = $16 + 16 = 32$

89. (d) $x - y = \frac{1}{9} \{ (10x + y) - (10y + x) \} = \frac{1}{9}$

$$(9x - 9y) = x - y$$

90. (e) Since, $A + B + C = 16$

(Possible values of A, B and C are 0, 6 & 9).

Also $A \neq B, B \neq C, A \neq C$.

If $C = 6, A + B$ should be 10, which is not possible.

If $C = 9, A + B$ should be 7, which is also not possible.

If $C = 0, A + B$ should be 16, which is also not possible.

91. (b) By trial and error method.

92. (e) $2x + y = 15 \Rightarrow y = 15 - 2x \dots\dots(i)$

$$2y + z = 25 \Rightarrow 2(15 - 2x) + z = 25 \text{ [from (i)]}$$

$$\Rightarrow 4x - z = 5 \dots\dots(ii)$$

$$\text{and } 2z + x = 26 \dots\dots(iii)$$

Combining equation (ii) and (iii), we get $z = 11$

93. (d) $P(P - 3) < 4(P - 3);$

$$P(P - 3) - 4(P - 3) < 0$$

$$(P - 3)(P - 4) < 0$$

This means that when

$$(P - 3) > 0 \text{ then } (P - 4) < 0 \dots\dots(i)$$

$$\text{or, when } (P - 3) < 0 \text{ then } (P - 4) > 0 \dots\dots(ii)$$

From (i),

$$P > 3 \text{ and } P < 4$$

$$\therefore 3 < P < 4$$

From (ii)

$$P < 3 \text{ and } P > 4$$

94. (d) $P + R + 2Q = 59;$

$$Q + R + 3P = 68$$

$$\text{and } P + 3(Q + R) = 108$$

Solving the above two equations, we get $P = 12$ years.

95. (a) Let the ages of Harish and Seema be x and y respectively.

According to the question,

$$x \cdot y = 240 \dots\dots(i)$$

$$2y - x = 4 \dots\dots(ii)$$

Solving equations (i) and (ii), we get

$$y = 12 \text{ years}$$

96. (e) $5P9 + 3R7 + 2Q8 = 1114$

For the maximum value of Q , the values of P and R should be the minimum, i.e. zero each.

$$\text{Now, } 509 + 307 + 2Q8 = 1114$$

$$\text{or, } 816 + 2Q8 = 1114$$

$$\text{or, } 2Q8 = (1114 - 816) = 298$$

So, the reqd value of Q is 9.

97. (e) $\frac{2}{5} \times \frac{1}{4} \times \frac{3}{7} \times x = 15$

$\therefore \frac{x}{2} = \frac{5 \times 7 \times 2 \times 5}{2} = 25 \times 7 = 175$

98. (d) Let, the two-digit no. be xy , i.e. $10x + y$ then,

$x + y = \frac{1}{11} [(10x + y) + (10y + x)] = x + y$

Thus we see that the difference of x and y can't be determined.

Hence, the answer is data inadequate.

99. (c) Let the fraction be $\frac{x}{y}$ then

$\frac{x+1}{y+2} = \frac{2}{3}$ or, $3x+3 = 2y+4$ or, $3x = 2y+1$ I

Also, we have

$\frac{x+5}{y+1} = \frac{5}{4}$

or, $4x+20 = 5y+5$

or $4x = 5y - 15$ II

From I and II, we get

$\frac{2y+1}{3} = \frac{5y-15}{4}$

or, $8y+4 = 15y-45$

$\therefore y = 7$ and $x = \frac{2y+1}{3} = \frac{2 \times 7 + 1}{3} = \frac{15}{3} = 5$

\therefore Reqd original fraction = $\frac{x}{y} = \frac{5}{7}$

100. (d) Let the no. be $10x + y$
then $y = x + 2$ or $y - x = 2$ (i)

$(10y + x) - (10x + y) = 18$

or, $9y - 9x = 18$

$y - x = 2$ (ii)

From eq. (i) and (ii) we can't get any conclusion.

101. (d) $2x + y = 17 \Rightarrow y = 17 - 2x$ (i)

$y + 2z = 15 \Rightarrow 17 - 2x + 2z = 15$

$\Rightarrow 2x - 2z = 2 \Rightarrow x - z = 1$ (ii)

and $x + z = 9$ (iii)

Solving equations (i) and (ii), we get

$x = 5, z = 4$

$\therefore y = 17 - 2x = 17 - 10 = 7$

$4x + 3y + z = 4 \times 5 + 3 \times 7 + 4$

$= 20 + 21 + 4 = 45$

102. (c) Let the numerator and denominator be x and y

respectively. Then $\frac{x+2}{y+3} = \frac{7}{9}$

or, $9(x+2) = 7(y+3)$

or $9x - 7y = 3$ (i)

$\frac{x-1}{y-1} = \frac{4}{5}$

$\Rightarrow 5x - 4y = 1$ (ii)

Solving (i) and (ii), we get

$x = 5, y = 6$

Reqd fraction = $5/6$

103. (a) $3n^2 - 18n + 24 = 0$

or, $n^2 - 6n + 8 = 0$ or, $(n-4)(n-2) = 0$

$\therefore n = 4, 2$

$\therefore n > 4$

104. (d) $R - M = 7000$ and $S - M = 3000$

Here, $S + M + R$ can be found only when one more equation in terms of S and R is given. Therefore, Can't be determined is the correct answer.

105. (c) Let the no. be N .

Now, $\frac{3N}{5} - \frac{N}{2} = 30$ or, $\frac{N}{10} = 30$

or, $N = 300$

80% of $N = 240$.

106. (b) Let the two-digit no. be $10x + y$.

Then, $(10x + y) - (10y + x) = 27$

or, $x - y = 3$

107. (a) $F + S = 4S$

or, $F = 3S \Rightarrow F : S = 3 : 1$

The ages of father and son = 56 years

\therefore Son's age = $\frac{1}{4} \times 56 = 14$ years

108. (d) Let the number be x .

$\therefore \frac{2}{5} \times \frac{1}{4} \times \frac{5}{8} \times x = 6$

$\therefore x = \frac{6 \times 5 \times 4 \times 8}{2 \times 1 \times 5} \times \frac{1}{2} = 48$

109. (a) Let the two-digit number be $10x + y$.

Then $x + y = \frac{1}{5}(10x + y - 10y - x)$

or, $x + y = \frac{9}{5}(x - y)$

or, $4x - 14y = 0 \Rightarrow \frac{x}{y} = \frac{7}{2}$

Using componendo & dividendo, we have,

$\frac{x+y}{x-y} = \frac{7+2}{7-2} = \frac{9}{5}$ i.e., $x - y = 5k$

Here k has the only possible value, $k = 1$. Because the difference of two single-digit numbers will always be of a single digit.

110. (c) $J = \frac{2}{5}A$, $P = \frac{1}{4} \times \frac{2}{5}A = \frac{1}{10}A$
- $$\frac{1}{10}A - 200 = 600 \therefore \frac{1}{10}A = 800$$
- $A = ₹ 8,000$
111. (a) For Q to be maximum. P and R will also be maximum, i.e., $P = R = 9$.
So, by putting the value of P and R in $5P^9 - 7Q^2 + 9R^6 = 823$, we get $Q = 7$
112. (d) Let the two-digit no. be $10x + y$.
According to question,
 $(10x + y) - (10y + x) = 54$
 $9x - 9y = 54$ $x - y = 6$
113. (c) Let the two numbers be x and y .
 $\therefore xy = 192$, $x + y = 28$ (i)
 $\therefore (x - y)^2 = (x + y)^2 - 4xy = 784 - 768 = 16$
 $\therefore x - y = 4$ (ii)
Combining (i) and (ii), $x = 16$, and $y = 12$.
114. (e) Let the present ages of Mr. Ramesh and his son be x and y respectively.
 $\therefore x = 4y$ and $(x + 10) = 2(y + 10)$ Solving the above two equations, we get $x = 20$ years and $y = 5$ years
115. (e) Let the total number of discs of 2 kg and 5 kg be ' a ' and ' b ' respectively.
Then, $a + b = 21$ and $5b = 2a$
Solving the above two equations, we get $a = 15$, $b = 6$
 \therefore Weight of all discs together
 $= 15 \times 2 + 6 \times 5 = 60$ kg
116. (a) No. of 10-year periods = 6
 $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times B = 64B$
117. (b) Let the middle no. = x
 $(x - 2) + x + (x + 2) = \frac{176}{4} - 14$ or,
 $3x = \frac{120}{4}$ or, $x = 10$
118. (d) number of tables and chairs and tripled, so price is $12,090 \times 3 = 36,000$
119. (a) Price of 39 pencils = $\frac{4263.05}{253} \times 39 \approx ₹ 650$
120. (c) Percentage of marks obtained by Sundari in first and second papers is 40% and 80% respectively. Percentage of marks obtained by Kusu in first and second papers is 50% and 90%, respectively. Percentage of marks obtained by Jyoti in first and second papers is 30% and 90% respectively.
From the above, we see that Jyoti's progress is maximum.



PERCENTAGE

CHAPTER

4

PERCENTAGE

Percentage in mathematics, means to convert a given fraction to a denominator of 100.

It is often denoted using the percent sign, "%".

For example, 45% (read as "forty-five percent") is equal to

$$45\% = \frac{45}{100} = 0.45$$

Quicker Methods to Solve the Problems of Percent

- ❖ For converting a fraction or a decimal to a Percentage, multiply it by hundred.

ILLUSTRATION 1: Convert the fraction $\frac{3}{5}$ into percent fraction.

$$\text{Sol. } \frac{3}{5} = \left(\frac{3}{5} \times 100\right)\% = 60\%$$

ILLUSTRATION 2: Convert the fraction $\frac{3.5}{100}$ into percent fraction

$$\text{Sol. } \frac{3.5}{100} = \left(\frac{3.5 \times 100}{100}\right)\% = 3.5\%$$

- ❖ For converting a percentage to a fraction or decimal, divide by hundred.

ILLUSTRATION 3: Convert 60% in a fraction.

$$\text{Sol. } 60\% = \frac{60}{100} = \frac{3}{5}$$

- ❖ For converting a percentage into a decimal number.

ILLUSTRATION 4: Convert 60% into a decimal number.

$$\text{Sol. } 60\% = \frac{60}{100} = 0.60$$

- ❖ If price of a commodity is increased by $x\%$, the consumption should be reduced, so that the expense remains the same, by

$$\frac{x}{(100+x)} \times 100\%.$$

ILLUSTRATION 5: If the price of sugar is increased by 25%, find how much percent a family must reduce their consumption of sugar so as not to increase the expenditure of the family?

Sol. Reduction in consumption of sugar

$$= \left(\frac{25}{100+25} \times 100\right)\% = \left(\frac{25 \times 100}{125}\right)\% = 20\%$$

ILLUSTRATION 6: If the price of Kerosene oil falls by 10%, find how much percent a householder increase its consumption, so as not to decrease expenditure on this item?

Sol. Increase in consumption of Kerosene oil

$$= \left[\frac{10}{100-10} \times 100\right]\%$$

$$\left(\frac{10}{90} \times 100\right)\% = 11.11\%$$

- ❖ If A is $x\%$ greater than B, then B will be

$$\left(\frac{x}{100+x} \times 100\right)\% \text{ lesser than A.}$$

- ❖ If A is $x\%$ lesser than B, then B will be

$$\left(\frac{x}{100-x} \times 100\right)\% \text{ greater than A.}$$

ILLUSTRATION 7: If income of Rekha is 30% less than that of Vina, then how much percent is Vina's income more than that of Rekha?

Sol. Vina's income is more than that of Rekha by

$$= \left[\frac{30}{100-30} \times 100\right]\% = \left[\frac{30}{70} \times 100\right]\% = 42\frac{6}{7}\%$$

ILLUSTRATION 8: If Ravi's salary is 50% more than that of Gopal's, then how much percent is Gopal's salary less than that of Ravi's salary?

Sol. Gopal's salary is less than that of Ravi's by

$$= \left[\frac{50}{100+50} \times 100\right]\% = 33\frac{1}{3}\%$$

- ❖ If price of a commodity is decreased by $x\%$, the consumption can be increased, so that the expense remains the same,

$$\text{by } \frac{x}{100+x} \times 100\%$$

- ❖ To find percentage increase or decrease in consumption, due to increase/ decrease in price, followed by an increase/ decrease in consumption.

% increase/decrease in price (a) + % increase/decrease in consumption (b) + $\frac{a \times b}{100} =$ % increase decrease in expenditure.

ILLUSTRATION 9: The price of sugar increased by 20%. But expenses increased only by 10%. What is the percentage increase or decrease in consumption ?

Sol. Keeping the above formula in mind, we get–

$$20 + b + \frac{20b}{100} = 10$$

$$b + \frac{20b}{100} = 10 - 20 = -10$$

$$\frac{120b}{100} = -10$$

$$b = \frac{-10 \times 100}{120} = -8.33$$

which means that consumption decrease by 8.33%.

- ❖ To find given income, when percentage expenditure on different items and balance income is given, following formula can be used–

$$\left[-x_i \left(\frac{q_0 \text{ expenditure}}{100} \right) \right] \times \left[1 - \frac{q_0 \text{ expenditure of the balance}}{100} \right]$$

= Remaining amount.

ILLUSTRATION 10: Arvind spends 25% of his income on food; 15% on education of his children and 20% on rent. 20% of the balance, he spends on clothes. After all this expenditure, he is left with ₹ 10,000. Find his total income.

Sol. Keeping in mind, the above formula, we get–

$$\left[x - \frac{(25 + 15 + 20)x}{100} \right] \left(1 - \frac{20}{100} \right) = 10,000$$

$$= \left(x - \frac{60x}{100} \right) \left(\frac{80}{100} \right) = 10,000$$

$$= \frac{40x}{100} \times \frac{80}{100} = 10,000$$

$$x = \frac{10,000 \times 100 \times 100}{40 \times 80}$$

$$= 31,250$$

- ❖ To find population of a country, when different increase percentages are given, across a number of years, following formula can be used–

$$P_N = P_0 \left(1 + \frac{R_1}{100} \right) \left(1 + \frac{R_2}{100} \right) \dots \dots \dots$$

ILLUSTRATION 11: The present population of Agra is 15,00,000 population during 2015 grows at a rate of 10%, and that during 2016 grows at a rate of 8%. Find the population at the end of 2016.

Sol. According to the formula given above–

$$P_N = 15,00,000 \left(1 + \frac{10}{100} \right) \left(1 + \frac{8}{100} \right)$$

$$= 1782000$$

Students should remember that commutative property is applicable in percentage also.

So, $x\%$ of $y = y\%$ of x .

So, if you are required to 12% of 50, then it would be easier to find 50% of 12, which is '6'.

Facts to Remember

Fractional Equivalents of Important Percentages

$1\% = \frac{1}{100}$	$2\% = \frac{1}{50}$	$4\% = \frac{1}{25}$	$8\% = \frac{2}{25}$	$16\% = \frac{4}{25}$	$64\% = \frac{16}{25}$	$96\% = \frac{24}{25}$
$5\% = \frac{1}{20}$	$10\% = \frac{1}{10}$	$20\% = \frac{1}{5}$	$40\% = \frac{2}{5}$	$60\% = \frac{3}{5}$	$80\% = \frac{4}{5}$	$120\% = \frac{6}{5}$
$6\frac{1}{4}\% = \frac{1}{16}$	$12\frac{1}{2}\% = \frac{1}{8}$	$25\% = \frac{1}{4}$	$37\frac{1}{2}\% = \frac{3}{8}$	$50\% = \frac{1}{2}$	$87\frac{1}{2}\% = \frac{7}{8}$	$100\% = 1$
$8\frac{1}{3}\% = \frac{1}{12}$	$16\frac{2}{3}\% = \frac{1}{6}$	$33\frac{1}{3}\% = \frac{1}{3}$	$66\frac{2}{3}\% = \frac{2}{3}$	$83\frac{1}{3}\% = \frac{5}{6}$	$133\frac{1}{3}\% = \frac{4}{3}$	$166\frac{2}{3}\% = \frac{5}{3}$

SOLVED EXAMPLES

EXAMPLE 1: 88% of 900 – (?)² = 623

- (a) 69 (b) 121
(c) 13 (d) 169
(e) None of these

Sol. (c) $(?)^2 = \frac{900 \times 88}{100} - 623$
 $= 792 - 623 = 169$
 $\Rightarrow ? = \sqrt{169} = 13$

EXAMPLE 2: In an annual examination Harish scores a total of 421 marks out of 675. What is his approximate percentage in the annual examination?

- (a) 56 (b) 72
(c) 92 (d) 88
(e) 62

Sol. (e) Percentage of marks obtained by Harish
 $= \frac{421}{675} \times 100 \approx 62.4 \approx 62$

ILLUSTRATION 3: In an examination it is required to get 270 of the aggregate marks to pass. A student gets 216 marks and is declared failed by 8% marks. What are the maximum aggregate marks a student can get?

- (a) 825 (b) 675
(c) 750 (d) Cannot be determined
(e) None of these

Sol. (b) Difference = 270 - 216 = 54
 According to the question,
 8% of total aggregate marks = 54
 \Rightarrow Total aggregate marks = $\frac{54 \times 100}{8} = 675$
 Alternatively,
 Total aggregate marks
 $= \frac{\text{Difference in marks} \times 100}{\% \text{ by which the candidate scores less / more}}$
 $= \frac{54 \times 100}{8} = 675$

EXAMPLE 4: 56% of a number is 1064. What is 38% of that number?

- (a) 666 (b) 722
(c) 856 (d) 912
(e) None of these

Sol. (b) 38% of the number = $\frac{1064 \times 100}{56} \times \frac{38}{100} = 722$

EXAMPLE 5: Nupur invests ₹ 89856, which is 26% of her annual income, in mutual funds. What is her monthly income?

- (a) ₹ 33606.25 (b) ₹ 28990
(c) ₹ 28800 (d) ₹ 23980.50
(e) None of these

Sol. (c) Annual income of Nupur = $\frac{89856 \times 100}{26} = 345600$

\therefore Nupur's monthly income = ₹ $\left(\frac{345600}{12} \right) = ₹ 28800$

EXAMPLE 6: Two candidates contested an election. If one got 520 votes which was 65% of votes, what was the total number of votes?

- (a) 858 (b) 702
(c) 780 (d) 754
(e) None of these

Sol. (e) According to the question,

$\frac{65}{100} \times \text{Total votes} = 520$

\therefore Total votes = $\frac{520 \times 100}{65} = 800$

EXAMPLE 7: Surjeet Singh's salary is 80% of Ranjeet's salary. What is Surjeet Singh's salary if Ranjeet's salary is ₹ 15000?

- (a) ₹ 10,000 (b) ₹ 18,000
(c) ₹ 12,500 (d) ₹ 12,000
(e) None of these

Sol. (d) Surjeet's salary = 80% of 15000

$= 15000 \times \frac{80}{100} = ₹ 12000$

EXAMPLE 8: The population of a town is 189000. It decreases by 8% in the 1st year and increases by 5% in the 2nd year. What is the population in the town at the end of 2 years?

- (a) 193914 (b) 185472
(c) 182574 (d) 191394
(e) None of these

Sol. (c) After 2 years, the required population of the town

$= 189000 \left(1 - \frac{8}{100} \right) \left(1 + \frac{5}{100} \right)$

$= \left[\frac{92}{100} \right] \left[\frac{105}{100} \right] = 182574$

EXAMPLE 9 : If the numerator of a fraction is increased by 400% and the denominator is increased by 500%, the resultant

fraction is $\frac{10}{21}$. What was the original fraction?

- (a) $\frac{5}{12}$ (b) $\frac{8}{13}$
 (c) $\frac{17}{14}$ (d) $\frac{4}{7}$
 (e) None of these

Sol. (d) Let the original fraction be = $\frac{x}{y}$

According to the question,

$$\frac{x + 400\% \text{ of } x}{y + 500\% \text{ of } y} = \frac{10}{21}$$

$$\text{or } \frac{x \times \frac{500}{100}}{y \times \frac{600}{100}} = \frac{10}{21}$$

$$\text{or } \frac{5x}{6y} = \frac{10}{21}$$

$$\text{or } \frac{x}{y} = \frac{10}{21} \times \frac{6}{5} = \frac{4}{7}$$

EXERCISE

- There are 1225 employees in an organization, out of which 40% got transferred to different places. How many such employees got transferred ?
 (a) 540 (b) 490
 (c) 630 (d) 710
 (e) None of these
- If the numerator of a fraction is increased by 500% and the denominator is increased by 300%, the resultant fraction is $2\frac{4}{7}$. What was the original fraction?
 (a) $\frac{4}{7}$ (b) $\frac{12}{7}$
 (c) $\frac{15}{4}$ (d) $\frac{6}{5}$
 (e) None of these
- What is 25% of 50% of $\frac{2}{3}$ rd of 630?
 (a) 36.5 (b) 52.5
 (c) 45.5 (d) 68.5
 (e) None of these
- Shilpa spent 8% on school fees, 25% on rent and 17% on furniture. 25% of the remaining amount was spent on medical bills and the remaining ₹ 6,000 was set aside for investment. How much money did she spend on rent ?
 (a) ₹ 3,750 (b) ₹ 6,000
 (c) ₹ 4,000 (d) ₹ 3,250
 (e) None of these
- The difference between 89% of a number and 73% of the same number is 448. What is 49% of that number ?
 (a) 1426 (b) 1372
 (c) 1218 (d) 1124
 (e) None of these
- 75% of 740 of $\frac{3}{5} = ?$
 (a) 121 (b) 91
 (c) 555 (d) 333
 (e) None of these
- If the production of a factory grows at a 8% p.a., what will be its production for the year 2006 if its production in 2004 was 70 lakh tonnes?
 (a) 63.48 lakh tonnes (b) 81.68 lakh tonnes
 (c) 81 lakh tonnes (d) 80.68 lakh tonnes
 (e) None of these
- The difference between 58% of a number and 39% of the same number is 247. What is 62% of that number ?
 (a) 1,300 (b) 806
 (c) 754 (d) 1,170
 (e) None of these
- What is 240 per cent of 700?
 (a) 1650 (b) 1780
 (c) 1560 (d) 1710
 (e) None of these
- 15% of 6500 = ? % of 12500
 (a) 8.2 (b) 7.5
 (c) 6.3 (d) 7.8
 (e) None of these
- The population of a town is 126800. It increases by 15% in the 1st year and decreases by 20% in the 2nd year. What is the population of the town at the end of 2 years?
 (a) 174984 (b) 135996
 (c) 116656 (d) 145820
 (e) None of these
- 8926 - ? % of 650 = 8848
 (a) 15 (b) 8
 (c) 12 (d) 10
 (e) None of these

13. 52% of $666 + ? = 500$
(a) 138.53 (b) 168.46
(c) 144.54 (d) 153.68
(e) None of these
14. The difference between 75% of a number and 20% of the same number is 378.4 . What is 40% of that number?
(a) 275.2 (b) 274
(c) 267.2 (d) 266
(e) None of these
15. If the numerator of a fraction is increased by 200% and the denominator of the fraction is increased by 150% , the resultant fraction is $\frac{9}{35}$. What is the original fraction?
(a) $\frac{3}{10}$ (b) $\frac{2}{15}$
(c) $\frac{3}{16}$ (d) $\frac{2}{7}$
(e) None of these
16. 40% of 15% of $\frac{3}{4}$ th of a number is 153 . What is the number?
(a) 3400 (b) 3650
(c) 3600 (d) 3200
(e) None of these
17. 680% of $(?) = 290360$
(a) 43800 (b) 42700
(c) 41900 (d) 42500
(e) None of these
18. $920 \times ?\%$ of $7.5 = 2898$
(a) 42 (b) 36
(c) 45 (d) 48
(e) None of these
19. The difference between 42% of a number and 35% of the same number is 110.6 . What is 60% of that number?
(a) 936 (b) 948
(c) 790 (d) 1106
(e) None of these
20. If the numerator of a fraction is increased by 250% and the denominator is increased by 300% , the resultant fraction is $\frac{7}{9}$. What is the original fraction?
(a) $\frac{8}{11}$ (b) $\frac{7}{8}$
(c) $\frac{8}{9}$ (d) $\frac{7}{11}$
(e) None of these
21. The wheat sold by a grocer contained 10% low quality wheat. What quantity of good quality wheat should be added to 150 kgs of wheat so that the percentage of low quality wheat becomes 5% ?
(a) ₹ 150kg (b) ₹ 135kg
(c) ₹ 50kg (d) ₹ 85kg
(e) None of these
22. What is 26% of 55% of $\frac{10}{13}$ th of 6100 ?
(a) 617 (b) 681
(c) 706 (d) 734
(e) None of these
23. One-eighth of a number is 17.25 . What will 73% of the number be?
(a) 100.74 (b) 138.00
(c) 96.42 (d) 82.66
(e) None of these
24. 45% of a number is 255.6 . What is 25% of that number?
(a) 162 (b) 132
(c) 152 (d) 142
(e) None of these
25. The difference between 42% and 28% of a number is 210 . What is 59% of that number?
(a) 630 (b) 885
(c) 420 (d) 900
(e) None of these
26. In an examination it is required to get 40% of the aggregate marks to pass. A student gets 261 marks and is declared failed by 4% marks. What are the maximum aggregate marks a student can get?
(a) 700 (b) 730
(c) 745 (d) 765
(e) None of these
27. The difference between 58% of a number and 39% of the same number is 247 . What is 82% of that number?
(a) 1300 (b) 1066
(c) 1052 (d) 1000
(e) None of these
28. 56% of a number is 463.68 . What is 25% of that number?
(a) 202 (b) 204
(c) 206 (d) 208
(e) None of these
29. Manish invests ₹ 3,818, which is 20% of his monthly income, in insurance policies. What is his monthly income?
(a) ₹ 19090 (b) ₹ 19900
(c) ₹ 19990 (d) ₹ 19009
(e) None of these
30. There are 1556 employees in an organization. Out of these, 25% got transferred to different places. How many such employees got the transfer?
(a) 394 (b) 404
(c) 419 (d) 399
(e) None of these
31. In an examination Nisha scores a total of 555 marks out of 850 . What is her approximate percentage in the examination?
(a) 59 (b) 72
(c) 68 (d) 65
(e) 70

32. What is the value of 280% of 460?
 (a) 1188 (b) 1284
 (c) 1288 (d) 1280
 (e) None of these
33. A student scores 64% marks in 6 papers of 150 marks each. He scores 25% of his total obtained marks in Hindi and English together. How much is his total score for both these papers?
 (a) 120 (b) 124
 (c) 140 (d) 144
 (e) 150
34. Sumit obtained a total of 1012 marks out of 1150 in an examination. What is his percentage in the examination?
 (a) 86 (b) 88
 (c) 84 (d) 90
 (e) None of these
35. $570\% \text{ of } ? = 377910$
 (a) 64900 (b) 66300
 (c) 64100 (d) 65600
 (e) None of these
36. The population of a town is 198000. It increases by 7% in the 1st year and decreases by 5% in the 2nd year. What is the population of the town at the end of 2 years?
 (a) 211860 (b) 201267
 (c) 222453 (d) 198900
 (e) None of these
37. The difference between 38% of a number and 24% of the same number is 135.10. What is 40% of that number?
 (a) 394 (b) 370
 (c) 378 (d) 386
 (e) None of these
38. The total number of boys in a school is 24% more than the total number of girls in the school. What is the respective ratio of the total number of boys to the total number of girls in the school?
 (a) 25 : 31 (b) 31 : 25
 (c) 91 : 21 (d) Cannot be determined
 (e) None of these
39. In an examination it is required to get 296 of the total maximum aggregate marks to pass. A student gets 259 marks and is declared failed. The difference of marks obtained by the student and that required to pass is 5%. What are the maximum aggregate marks a student can get?
 (a) 690 (b) 780
 (c) 740 (d) Cannot be determined
 (e) None of these
40. What is the value of 150% of 3342 ?
 (a) 4869 (b) 5013
 (c) 5163 (d) 5019
 (e) None of these
41. There are 1850 employees in an organization. Out of these 38% got transferred to different places. How many such employees got the transfer?
 (a) 740 (b) 723
 (c) 703 (d) 717
 (e) None of these
42. 70% of a number is 644. What is 30% of that number?
 (a) 274 (b) 302
 (c) 252 (d) 328
 (e) None of these
43. Manish invests ₹ 3,960, which is 30% of his monthly income, in insurance policies. What is his monthly income?
 (a) ₹13,200 (b) ₹13,400
 (c) ₹13,600 (d) ₹13,800
 (e) None of these
44. In an examination Krish scores a total of 654 marks out of 950. What is his approximate percentage in the examination?
 (a) 74 (b) 65
 (c) 63 (d) 78
 (e) 69
45. Swapana spent ₹ 44,620 on Deepawali Shopping, ₹ 32,764 on buying Laptop and the remaining 32% of the total amount was left as cash with her. What was the total amount?
 (a) ₹ 36,416 (b) ₹ 1,13,800
 (c) ₹ 77,384 (d) Cannot be determined
 (e) None of these
46. $12\% \text{ of } 550 + ?\% \text{ of } 320 = 82$
 (a) 6 (b) 8
 (c) 5 (d) 9
 (e) None of these
47. In a examination it is required to get 40% of the aggregate marks to pass. A student gets 265 marks and is declared failed by 55 marks. What is the maximum aggregate marks a student can get ?
 (a) 800 (b) 750
 (c) 650 (d) Cannot be determined
 (e) None of these
48. $64\% \text{ of } (?) - 96\% \text{ of } 1120 = 499.2$
 (a) 2600 (b) 2540
 (c) 2460 (d) 2280
 (e) None of these
49. If the numerator of a fraction is increased by 200% and the denominator is increased by 160%, the resultant fraction is $\frac{7}{13}$. What is the original fraction?
 (a) $\frac{7}{15}$ (b) $\frac{2}{5}$
 (c) $\frac{8}{15}$ (d) $\frac{5}{7}$
 (e) None of these
50. $58\% \text{ of } 960 - ?\% \text{ of } 635 = 277.4$
 (a) 24 (b) 36
 (c) 44 (d) 58
 (e) None of these
51. $65\% \text{ of } 599 = ?$
 (a) 345.65 (b) 389.35
 (c) 413.75 (d) 436.85
 (e) None of these

52. $(18\% \text{ of } 250 + 25\% \text{ of } 144) \text{ of } ? = 54$
- (a) $\frac{2}{3}$ (b) $\frac{3}{2}$
- (c) $\frac{4}{9}$ (d) $\frac{1}{3}$
- (e) None of these
53. $36\% \text{ of } 4800 \times 0.2\% \text{ of } 1320 = ?$
- (a) 4535.52 (b) 4551.36
- (c) 4561.92 (d) 4572.48
- (e) None of these
54. $? \% \text{ of } 35568 \div 650 = 456$
- (a) 12 (b) 16
- (c) 18 (d) 14
- (e) None of these
55. $60\% \text{ of } 8\frac{1}{4} + \frac{6}{5} = 15 - ?$
- (a) 5.55 (b) 6.27
- (c) 8.85 (d) 6.13
- (e) None of these
56. $35\% \text{ of } 160 + ? \% \text{ of } 180 = 50\% \text{ of } 310$
- (a) 35 (b) 55
- (c) 65 (d) 45
- (e) None of these
57. $137\% \text{ of } 12345 \approx ?$
- (a) 17000 (b) 15000
- (c) 1500 (d) 14300
- (e) 900
58. $(8.2\% \text{ of } 365) - (1.75\% \text{ of } 108) = ?$
- (a) 16.02 (b) 28.04
- (c) 42.34 (d) 53.76
- (e) None of these
59. $(739\% \text{ of } 383) \div 628 \approx ?$
- (a) 10.00 (b) 4.50
- (c) 15.75 (d) 19.25
- (e) 24.15
60. $94.5\% \text{ of } 550 = ?$
- (a) 506.45 (b) 521.65
- (c) 518.55 (d) 519.75
- (e) None of these
61. $\frac{7}{8} \text{ of } 248 + 20\% \text{ of } 110 = ?$
- (a) 192 (b) 202
- (c) 212 (d) 239
- (e) None of these
62. Bovina spent ₹ 44,668 on her air tickets, ₹ 56,732 on buying gifts for the family members and the remaining 22% of the total amount she had as cash with her. What was the total amount?
- (a) ₹ 28,600 (b) ₹ 1,30,000
- (c) ₹ 1,01,400 (d) ₹ 33,800
- (e) None of these
63. In a college election between two candidates, one candidate got 55% of the total valid votes. 15% of the votes were invalid. If the total votes were 15,200, what is the number of valid votes the other candidate got ?
- (a) 7106 (b) 6840
- (c) 8360 (d) 5814
- (e) None of these
64. 15% of 45% of a number is 105.3. What is 24% of that number?
- (a) 385.5 (b) 374.4
- (c) 390 (d) 375
- (e) None of these
65. On a test consisting of 250 questions, Jassi answered 40% of the first 125 questions correctly. What percent of the other 125 questions does she need to answer correctly for her grade on the entire exam to be 60% ?
- (a) 75 (b) 80
- (c) 60 (d) Cannot be determined
- (e) None of these
66. The population of a town was 48600. It increased by 25% in the first year and decreased by 8% in the second year. What will be the population of the town at the end of 2 years?
- (a) 65610 (b) 55580
- (c) 60750 (d) 64850
- (e) None of these
67. Twenty five percent of Pranab's annual salary is equal to eighty percent of Surya's annual salary. Surya's monthly salary is forty percent of Dheeru's monthly salary. If Dheeru's annual salary is ₹ 6 lacs, what is Pranab's monthly salary? (At some places annual income and in some place monthly income is given.)
- (a) ₹ 7.68 lacs (b) ₹ 56,000
- (c) ₹ 8.4 lacs (d) ₹ 64,000
- (e) None of these
68. In a test, minimum passing percentage for girls and boys is 30% and 45% respectively. A boy scored 280 marks and failed by 80 marks. How many more marks did a girl require to pass in the test if she scored 108 marks ?
- (a) 132 (b) 140
- (c) 160 (d) 112
- (e) None of these
69. Two candidates fought an election. One of them got 64% of the total votes and won with 992 votes. What was the total number of votes polled ?
- (a) 1500 (b) 1580
- (c) 1550 (d) Cannot be determined
- (e) None of these
70. In an examination it is required to get 336 aggregate marks to pass. A student gets 35% marks and is declared failed by 42 marks. What are the maximum aggregate marks a student can get?
- (a) 800 (b) 825
- (c) 850 (d) Cannot be determined
- (e) None of these
71. Mr. Khanna took a loan of ₹10,000 on simple interest for two years at the rate of 3 p.c.p.a. The total amount that he will be paying as interest in 2 years is 3% of his monthly salary. What is his monthly salary?

- (a) ₹30,000 (b) ₹16,000
(c) ₹20,000 (d) ₹12,000
(e) None of these
72. If the numerator of certain fraction is increased by 200% and the denominator is increased by 150% the new fraction thus formed is $\frac{9}{10}$. What is the original fraction?
- (a) $\frac{3}{4}$ (b) $\frac{1}{4}$
(c) $\frac{3}{5}$ (d) $\frac{2}{5}$
(e) None of these
73. Yesterday Priti typed an essay of 5000 words at the speed of 60 words per minute. Today she typed the same essay faster and her speed was 15% more than yesterday. What is the approximate difference in the time she took to type yesterday and the time she took to type today?
- (a) 20 minutes (b) 30 minutes
(c) 10 minutes (d) 40 minutes
(e) 1 hour
74. 71% of a number is more than its 46% by 120. What is 30% of that number?
- (a) 160 (b) 150
(c) 140 (d) 148
(e) None of these
75. Latika spends 45% of her monthly income on food and 30% of the monthly income on transport. Remaining amount ₹4500 She saves. What is her monthly income?
- (a) ₹16000 (b) ₹18000
(c) ₹16500 (d) ₹18500
(e) None of these
76. Last year there were 610 boys in a school. The number decreased by 20 percent this year. How many girls are there in the school if the number of girls is 175 percent of the total number of boys in the school this year?
- (a) 854 (b) 848
(c) 798 (d) 782
(e) None of these
77. Aryan got 350 marks and Vidya scored 76 percent marks in the same test. If Vidya scored 296 marks more than Aryan what were the maximum marks of the test?
- (a) 650 (b) 900
(c) 850 (d) 950
(e) None of these
78. A student was awarded certain marks in an examination. However, after re-evaluation, his marks were reduced by 40% of the marks that were originally awarded to him so that the new score now became 96. How many marks did the student lose after re-evaluation?
- (a) 58 (b) 68
(c) 63 (d) 56
(e) 64
79. 855 candidates applied for a job, out of which 80% of the candidates were rejected. How many candidates were selected for the job?
- (a) 684 (b) 151
(c) 676 (d) 179
(e) None of these
80. What should come in place of the question mark so that it satisfies equality of the equation?
 $32\% \text{ of } 750 < ?$
- (a) 23% of 600 (b) 46% of 207
(c) 98% of 250 (d) 75% of 320
(e) None of these
81. Mathew scored 42 marks in Biology, 51 marks in Chemistry, 58 marks Mathematics, 35 marks in Physics and 48 marks in English. The maximum marks a student can score in each subject are 60. How much overall percentage did Mathew get in this exam?
- (a) 76 (b) 82
(c) 68 (d) 78
(e) None of these
82. Kajal spends 55% of her monthly income on grocery, clothes and education in the ratio of 4 : 2 : 5 respectively. If the amount spent on clothes is ₹5540/–, what is Kajal's monthly income?
- (a) ₹55,400/– (b) ₹54,500/–
(c) ₹55,450/– (d) ₹55,650/–
(e) None of these
83. 35 percent of a number is two times 75 percent of another number. What is the ratio between the first and the second number respectively?
- (a) 35 : 6 (b) 31 : 7
(c) 23 : 7 (d) 32 : 9
(e) None of these
84. If the numerator of a fraction is increased by 20% and the denominator is increased by 25%, the fraction obtained is $\frac{3}{5}$. What was the original fraction?
- (a) $\frac{5}{7}$ (b) $\frac{4}{7}$
(c) $\frac{3}{8}$ (d) Cannot be determined
(e) None of these
85. The number of employees in Companies A, B and C are in a ratio of 4 : 5 : 6 respectively. If the number of employees in the Companies is increased by 25%, 30% and 50% respectively, what will be the new ratio of employees working in Companies A, B and C respectively?
- (a) 13 : 10 : 18 (b) 10 : 13 : 17
(c) 13 : 15 : 18 (d) Cannot be determined
(e) None of these
86. 65% of a number is more than its $\frac{2}{5}$ th by 140. What is 30% of that number?
- (a) 186 (b) 168
(c) 164 (d) 182
(e) None of these
87. Sonali invests 15% of her monthly salary in insurance policies. She spends 55% of her monthly salary in shopping and on household expenses. She saves the remaining amount of ₹12,750. What is Sonali's monthly income?
- (a) ₹42,500 (b) ₹38,800
(c) ₹40,000 (d) ₹35,500
(e) None of these

88. Mr. Davar spends 38% of his monthly income on food, 25% on children's education and 12% on transport and the remaining amount of ₹5,800 he saves. What is Mr. Davar's monthly income ?
- (a) ₹23,200 (b) ₹24,200
(c) ₹23,800 (d) ₹24,400
(e) None of these
89. 56% of a number is less than its 72% by 56. What is 70% of that number?
- (a) 300 (b) 235
(c) 240 (d) 350
(e) None of these
90. Nandkishore gives 35% of the money he had to his wife and gave 50% of the money he had to his sons. Remaining amount of ₹11250 he kept for himself. What was the total amount of money Nandkishore had ?
- (a) ₹63750 (b) ₹75000
(c) ₹73650 (d) ₹72450
(e) None of these
91. Mr. Nair's monthly salary is ₹22,500. He took a loan of ₹30,000 on simple interest for 3 years at the rate of 5 p.c.p.a. The amount that he will be paying as simple interest in 3 years is what percent of his monthly salary?
- (a) 10 (b) 18
(c) 20 (d) 25
(e) None of these
92. The sum of 15% of a positive number and 10% of the same number is 70. What is twice of that number ?
- (a) 440 (b) 280
(c) 560 (d) 140
(e) None of these
93. Vikram scored 72 per cent marks in five subjects together, viz; Hindi, Science, Maths, English and Sanskrit together, where in the maximum marks of each subject were 100. How many marks did Vikram score in Science if he scored 80 marks in Hindi, 70 marks in Sanskrit, 76 marks in Maths and 65 marks in English?
- (a) 72 (b) 69
(c) 59 (d) 71
(e) None of these
94. In order to pass in an exam a student is required to get 975 marks out of the aggregate marks. Priya got 870 marks and was declared failed by 7 per cent. What are the maximum aggregate marks a student can get in the examination?
- (a) 1500 (b) 1000
(c) 1200 (d) Cannot be determined
(e) None of these
95. Six-eleventh of a number is equal to twenty-two percent of second number. Second number is equal to the one-fourth of third number. The value of the third number is 2400. What is 45% of first number ?
- (a) 109.8 (b) 111.7
(c) 117.6 (d) 123.4
(e) None of these
96. HR company employees 4800 people, out of which 45 percent are males & 60 percent of the males are either 25 years or older. How many males are employed in that HR company who are younger than 25 years ?
- (a) 2640 (b) 2160
(c) 1296 (d) 864
(e) None of these
97. A team played 40 games in a season a won in 24 of them. What percent of games played did the team win?
- (a) 70% (b) 40%
(c) 60% (d) 35%
(e) None of these
98. In an examination, Raman scored 25 marks less than Rohit. Rohit scored 45 more marks than Sonia. Rohan scored 75 marks which is 10 more than Sonia. Ravi's score is 50 less than, max marks of the test. What approximate percentage of marks did Ravi score in the examination, if he gets 34 marks more than Raman?
- (a) 90 (b) 70
(c) 80 (d) 60
(e) 85
99. Mr. Giridhar spends 50% of his monthly income on household items and out of the remaining he spends 50% on transport 25% of entertainment, 10% on sports and the remaining amount of ₹900 is saved. What is Mr. Giridhar's monthly income?
- (a) ₹6000 (b) ₹12000
(c) ₹9000 (d) Cannot be determined
(e) None of these
100. Sum of 3 consecutive numbers is 2262. What is 41% of the highest number ?
- (a) 301.51 (b) 303.14
(c) 308.73 (d) 306.35
(e) 309.55
101. Akash scored 73 marks in subject A. He scored 56% marks in subject B and X marks in subject C. Maximum marks in each subject were 150. The overall percentage marks obtained by Akash in all the three subjects together were 54%. How many marks did he score in subject C?
- (a) 84 (b) 86
(c) 79 (d) 73
(e) None of these

Answer Key

1	(b)	19	(b)	37	(d)	55	(c)	73	(c)	91	(c)
2	(b)	20	(c)	38	(b)	56	(b)	74	(e)	92	(c)
3	(b)	21	(a)	39	(c)	57	(a)	75	(b)	93	(b)
4	(c)	22	(e)	40	(b)	58	(b)	76	(a)	94	(a)
5	(b)	23	(a)	41	(c)	59	(b)	77	(c)	95	(e)
6	(d)	24	(d)	42	(e)	60	(d)	78	(e)	96	(d)
7	(e)	25	(b)	43	(a)	61	(d)	79	(e)	97	(c)
8	(b)	26	(e)	44	(e)	62	(b)	80	(c)	98	(b)
9	(e)	27	(b)	45	(b)	63	(d)	81	(d)	99	(b)
10	(d)	28	(e)	46	(c)	64	(b)	82	(a)	100	(e)
11	(c)	29	(a)	47	(a)	65	(b)	83	(e)	101	(b)
12	(c)	30	(e)	48	(c)	66	(e)	84	(e)		
13	(d)	31	(d)	49	(a)	67	(d)	85	(e)		
14	(a)	32	(c)	50	(c)	68	(a)	86	(b)		
15	(e)	33	(d)	51	(b)	69	(e)	87	(a)		
16	(a)	34	(b)	52	(a)	70	(e)	88	(a)		
17	(b)	35	(b)	53	(c)	71	(c)	89	(e)		
18	(a)	36	(b)	54	(e)	72	(a)	90	(b)		

ANSWERS & EXPLANATIONS

1. (b) Number of transferred employees

$$= 40\% \text{ of } 1225 = \frac{1225 \times 40}{100} = 490$$

$$\therefore \text{Expenditure on rent} = 16000 \times \frac{25}{100} = ₹4000$$

5. (b) $\therefore (89 - 73)\% \text{ of the number} = 448$

2. (b) Let the original fraction be $\frac{x}{y}$.

$$\Rightarrow \text{Number} = \frac{448 \times 100}{16} = 2800$$

$$\text{Then, } \frac{x + 5x}{y + 3y} = 2 \frac{4}{7}$$

$$\therefore 49\% \text{ of } 2800 = \frac{2800 \times 49}{100} = 1372$$

$$\Rightarrow \frac{6x}{4y} = \frac{18}{7}$$

6. (d) $740 \times \frac{75}{100} \times \frac{3}{5} = 333$

$$\Rightarrow \frac{x}{y} = \frac{72}{42} = \frac{12}{7}$$

7. (e) Required production = $70 \left(1 + \frac{8}{100}\right)^2$ lakh tonnes

$$= 70 \left(1 + \frac{2}{25}\right)^2 \text{ lakh tonnes}$$

3. (b) $\frac{25}{100} \times \frac{50}{100} \times \frac{2}{3} \times 630$
 $= 52.5$

$$= 70 \times \frac{27}{25} \times \frac{27}{25} = 81.648 \text{ lakh tonnes}$$

4. (c) Let the income of Shilpa be = ₹x

$$\left[x - \frac{(8 + 25 + 17)x}{100} \right] \left(1 - \frac{25}{100} \right) = 6000$$

8. (b) According to the question,
 $(58 - 39)\% \text{ of number} = 247$

$$\frac{50x}{100} \times \frac{75}{100} = 6000$$

$$\text{or, number} = \frac{247 \times 100}{19} = 1300$$

$$x = \frac{6000 \times 100 \times 100}{50 \times 75} = 16,000$$

$$\therefore 62\% \text{ of } 1300 = 1300 \times \frac{62}{100} = 806$$

9. (e) 240% of 700

$$= 700 \times \frac{240}{100} = 1680$$

10. (d) $\frac{15}{100} \times 6500 = \frac{?}{100} \times 12500$

$$? = \frac{15 \times 6500}{12500} = 7.8$$

11. (c) Population at the end of 2nd year

$$= 126800 \times \left(1 + \frac{15}{100}\right) \times \left(1 - \frac{20}{100}\right)$$

$$= 126800 \times \frac{115}{100} \times \frac{80}{100} = 116656$$

12. (c) $8926 - \frac{?}{100} \times 650 = 8848$

$$\Rightarrow \frac{?}{100} \times 650 = 8926 - 8848 = 78$$

$$\Rightarrow ? = \frac{78 \times 100}{650} = 12$$

13. (d) $666 \times \frac{52}{100} + ? = 500$

$$\therefore ? = 500 - 346.32 = 153.68$$

14. (a) (75 - 20)% as number = 378.4

$$\text{or, Number} = \frac{378.4 \times 100}{55}$$

$$\therefore 40\% \text{ of number}$$

$$= \frac{378.4 \times 100}{55} \times \frac{40}{100} = 275.2$$

15. (e) Fraction is $\frac{x}{y}$

$$\therefore \frac{x + \frac{200}{100}x}{y + \frac{150}{100}y} = \frac{9}{35}$$

$$\Rightarrow \frac{x + 2x}{y + 1.5y} = \frac{9}{35}$$

$$\Rightarrow \frac{3x}{2.5y} = \frac{9}{35}$$

$$\therefore \frac{x}{y} = \frac{9 \times 2.3}{3 \times 35} = \frac{3}{14}$$

16. (a) Number $\times \frac{3}{4} \times \frac{15}{100} \times \frac{40}{100} = 153$

$$\Rightarrow \text{Number} = \frac{153 \times 4 \times 100 \times 100}{3 \times 15 \times 40} = 3400$$

17. (b) $? \times \frac{680}{100} = 290360$

$$\text{or } ? = \frac{290360 \times 100}{680} = 42700$$

18. (a) $\frac{920 \times ? \times 7.5}{100} = 2898$

$$\text{or } ? = \frac{2898 \times 100}{920 \times 7.5} = 42$$

19. (b) According to the question,
(42 - 35)% of number = 110.6

$$\text{or, Number} = \frac{110.6 \times 100}{7} = 1580$$

$$\therefore 60\% \text{ of } 1580 = \frac{1580 \times 60}{100} = 948$$

20. (c) Let the original fraction be $= \frac{x}{y}$

According to the question,

$$\frac{x \times \frac{350}{100} - 7}{y \times \frac{400}{100} - 9}$$

$$\Rightarrow \frac{7x}{8y} = \frac{7}{9} \Rightarrow \frac{x}{y} = \frac{7}{9} \times \frac{8}{7} = \frac{8}{9}$$

21. (a) Weight of low quality of wheat in 150 kgs of wheat

$$= \frac{150 \times 10}{100} = 15 \text{ kg.}$$

Suppose that x kgs of good quality wheat is mixed.

According to the question,

$$\frac{(x + 150) \times 5}{100} = 15$$

$$\text{or, } x = 150 \text{ kg.}$$

22. (e) Required value = $6100 \times \frac{10}{13} \times \frac{55}{100} \times \frac{26}{100} = 671$

23. (a) According to the question,

$$\therefore \frac{\text{Number}}{8} = 17.25$$

$$\text{or Number} = 17.25 \times 8 = 138$$

$$\therefore 73\% \text{ of } 138 = 138 \times \frac{73}{100} = 100.74$$

24. (d) According to the question,

$$\therefore \text{Number} \times \frac{45}{100} = 255.6$$

$$\text{or Number} = 255.6 \times \frac{20}{9} = 568$$

- $\therefore 25\% \text{ of number} = x \times \frac{25}{100}$
 $= 568 \times \frac{25}{100} = 142$
25. (b) Difference in % = $42 - 28 = 14\%$
 $\therefore \text{Number} = \frac{210 \times 100}{14} = 1500$
 $\therefore \text{Required answer} = \frac{59}{100} \times 1500 = 885$
26. (e) According to the question
 $(40 - 4)\%$ of maximum marks = 261
 $\therefore \text{Max. marks} = \frac{261}{36} \times 100 = 725$
27. (b) $(58 - 39)\%$ of number
 $\Rightarrow \text{Number} = \frac{247 \times 100}{19} = 1300$
 $\therefore 1300 \times \frac{82}{100} = 1066$
28. (e) According to the question,
 $\therefore \text{Number} \times \frac{56}{100} = 463.68$
 $\Rightarrow \text{Number} = \frac{463.68 \times 100}{56} = 828$
 $\therefore 25\% \text{ of number} = 828 \times \frac{25}{100} = 207$
29. (a) The monthly salary of Manish will be
 $= \frac{3818 \times 100}{20} = ₹19090$
30. (e) Required number of transferred employees
 $= \frac{1556 \times 25}{100} = 389$
31. (d) Required % = $\frac{555 \times 100}{850} = 65.294\%$
 $= 65\% \text{ (approx.)}$
32. (c) Required answer = $460 \times \frac{280}{100} = 1288$
33. (d) Total marks obtained by the student
 $= 6 \times \frac{64}{100} \times 150 = 576$
 Marks obtained in Hindi and English
 $= 25\% \text{ of } 576 = 576 \times \frac{25}{100} = 144$
34. (b) Required percentage = $\frac{1012}{1150} \times 100 = 88$
35. (b) $? \times \frac{570}{100} = 377910$
 or $? = \frac{377910 \times 100}{570} = 66300$
36. (b) Population of the town after 2 years
 $= 198000 \left(1 + \frac{7}{100}\right) \left(1 - \frac{5}{100}\right)$
 $= \frac{198000 \times 107 \times 95}{100 \times 100} = 201267$
37. (d) According to the question,
 $(38 - 24)\%$ of number = 135.10
 or, number $\times \frac{14}{100} = 135.10$
 or, number = $\frac{135.10 \times 100}{14} = 965$
 $\therefore 40\% \text{ of } 965 = 965 \times \frac{40}{100} = 386$
38. (b) Let the number of girls in the school be = 100
 $\therefore \text{Number of boys} = 124$
 $\therefore \text{Required ratio} = 124 : 100 = 31 : 25$
39. (c) According to the question,
 5% of max. marks = $296 - 259$
 $\therefore \text{Max. marks} = \frac{3700}{5} = 740$
40. (b) Required number = $3342 \times \frac{150}{100} = 5013$
41. (c) Required number of employees
 $= \frac{1850 \times 38}{100} = 703$
42. (e) $\therefore \frac{x \times 70}{100} = 644$
 $\Rightarrow \text{Number} = \frac{644 \times 100}{70}$
 $\therefore 30\% \text{ of number} = \frac{644 \times 100}{70} \times \frac{30}{100} = 276$
43. (a) Required monthly income
 $= \frac{3960 \times 100}{30} = ₹13200$

44. (e) Required approximate percentage

$$= \frac{654 \times 100}{950} \% = 68.84\% \approx 69\%$$

45. (b) Total amount spent

$$= 44620 + 32764 = ₹ 77384$$

$$\text{Percentage of amount spent} = 100 - 32 = 68\%$$

$$\therefore 68\% = 77384$$

$$\therefore 100\% = \frac{77384 \times 100}{68} = ₹ 113800$$

46. (c) $\frac{550 \times 12}{100} + \frac{320 \times ?}{100} = 82$

$$\Rightarrow 66 + 3.2 \times ? = 82$$

$$\Rightarrow 3.2 \times ? = 82 - 66$$

$$\Rightarrow ? = \frac{16}{3.2} = 5$$

47. (a) Let the maximum marks be x

$$\therefore (265 + 55) = \frac{40x}{100}$$

$$\text{or } 320 \times 100 = 40x$$

$$\therefore x = \frac{320 \times 100}{40} = 800$$

48. (c) $\frac{? \times 64}{100} - \frac{1120 \times 96}{100} = 499.2$

$$\text{or } ? \times \frac{64}{100} - 1075.2 = 499.2$$

$$\text{or } ? \times \frac{64}{100} = 499.2 + 1075.2$$

$$\text{or } ? \times \frac{64}{100} = 1574.4$$

$$\therefore ? = \frac{1574.4 \times 100}{64} = 2460$$

49. (a) Let the original fraction = $\frac{x}{y}$

According to the question,

$$\frac{\frac{300x}{100}}{\frac{260y}{100}} = \frac{7}{13}$$

$$\text{or } \frac{30x}{26y} = \frac{7}{13}$$

$$\therefore \frac{x}{y} = \frac{7}{13} \times \frac{26}{30} = \frac{7}{15}$$

50. (c) $960 \times \frac{58}{100} - \frac{635 \times ?}{100} = 277.4$

$$\Rightarrow 960 \times 58 - 635 \times ? = 277.4 \times 100$$

$$\Rightarrow 55680 - 635 \times ? = 27740$$

$$\Rightarrow 635 \times ? = 55680 - 27740 = 27940$$

$$\Rightarrow ? = \frac{27940}{635} = 44$$

51. (b) $? = \frac{599 \times 65}{100} = 389.35$

52. (a) $\left(250 \times \frac{18}{100} + 144 \times \frac{25}{100} \right)$ of $? = 54$

$$\Rightarrow (45 + 36) \text{ of } ? = 54$$

$$\Rightarrow 81 \times ? = 54$$

$$\Rightarrow ? = \frac{54}{81} = \frac{2}{3}$$

53. (c) $? = \frac{36}{100} \times 4800 \times \frac{0.2}{100} \times 1320$

$$= 1728 \times 2.64 = 4561.92$$

54. (e) $\frac{?}{100} \times \frac{35568}{650} = 456$

$$\Rightarrow \frac{456 \times 100 \times 650}{35568} \approx 903$$

55. (c) $15 \frac{6}{5} - 60\%$ of $8 \frac{1}{4}$

$$= 13.8 - \frac{60}{100} \times \frac{33}{4}$$

$$= 13.80 - 4.95 = 8.85$$

56. (b) $160 \times \frac{35}{100} + \frac{180 \times ?}{100} = \frac{310 \times 50}{100}$

$$\text{or } 160 \times 35 + 180 \times ? = 310 \times 50$$

$$\text{or } 5600 + 180 \times ? = 15500$$

$$\text{or } 180 \times ? = 15500 - 5600 = 9900$$

$$\text{or } ? = \frac{9900}{180} = 55$$

57. (a) 137% of 12345

$$= \frac{12345 \times 137}{100} = 16912.65 \approx 17000$$

58. (b) $? = 365 \times \frac{8.2}{100} - 108 \times \frac{1.75}{100}$

$$= 29.93 - 1.89 = 28.04$$

59. (b) $? = \left(383 \times \frac{739}{100} \right) \div 628$

$$\approx \left(\frac{380 \times 740}{100} \right) \div 630 \approx 2812 \div 630 \approx 4.46 \approx 4.50$$

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60. (d) 94.5% of $550 = ?$

$$? = 550 \times \frac{94.5}{100} = 519.75$$

61. (d) $? = 248 \times \frac{7}{8} + 110 \times \frac{20}{100}$

$$= 217 + 22 = 239$$

62. (b) Total expenditure = $44668 + 56732 = 101400$
Total percentage expenditure = $100 - 22 = 78\%$

$$\therefore \text{Total amount} = \frac{101400 \times 100}{78} = ₹ 130000$$

63. (d) Total valid votes = 85% of $15200 = 12920$
 \therefore Number of valid votes to other candidate = 45% of $12920 = 5814$

64. (b) Let the number be x .

$$\text{then, } x \times \frac{15}{100} \times \frac{45}{100} = 105.3$$

$$\Rightarrow x = \frac{105.3 \times 100 \times 100}{15 \times 45} = 1560$$

$$\text{So, } 24\% \text{ of } 1560 = 374.4$$

65. (b) 60% of $250 = 150$

$$40\% \text{ of } 125 = 50$$

$$\text{No. of correct answers in remaining 125 questions} = 150 - 50 = 100$$

$$\therefore \text{Percentage} = \frac{100 \times 100}{125} = 80\%$$

66. (e) Population after two years

$$= 48600 \times \frac{125}{100} \times \frac{92}{100} = 55890$$

67. (d) Dhreeru's monthly salary = $\frac{600000}{12} = ₹ 50000$

$$\text{Surya's monthly salary} = 50000 \times \frac{40}{100} = ₹ 20000$$

$$\text{Pranab's monthly salary} = 20000 \times \frac{80}{25} = ₹ 64000$$

68. (a) Total marks in the test = $(280 + 80) \times \frac{100}{45} = 800$

$$\text{Passing marks for girls} = 800 \times \frac{30}{100} = 240$$

$$\therefore \text{Required marks} = 240 - 108 = 132$$

69. (e) Votes obtained by winner candidate = 64%

$$\text{Votes obtained by loser candidate}$$

$$= (100 - 64) = 36\%$$

$$\text{Difference of votes} = (64 - 36) = 28\%$$

According to question,

$$\text{Total votes} = \frac{992 \times 100}{28} = 3542$$

70. (e) Let the maximum marks be x
According to the question,

$$\therefore \frac{35x}{100} + 42 = 336$$

$$\therefore x = 840$$

71. (c) $\text{SI} = \frac{10,000 \times 2 \times 3}{100} = 600$

Let his monthly salary be x
 3% of $x = 600$

$$\frac{3}{100}x = 600$$

$$x = \frac{600 \times 100}{3} = 20,000$$

72. (a) Let the numerator be x & denominator be y

$$\frac{x + 200\% \text{ of } x}{y + 150\% \text{ of } y} = \frac{9}{10}$$

$$\frac{x + \frac{200}{100}x}{y + \frac{150}{100}y} = \frac{9}{10}$$

$$\frac{3x}{2.5y} = \frac{9}{10}$$

$$\frac{x}{y} = \frac{9 \times 2.5}{10 \times 3} = \frac{22.5}{30} = \frac{225}{300} = \frac{3}{4}$$

73. (c) Time taken yesterday = $\frac{\text{No. of words typed}}{\text{Typing speed}}$

$$= \frac{5000}{60} = 83.33 \text{ mins.}$$

$$\text{Speed today} = 60 \times 115\% = 69$$

$$\text{Time taken} = \frac{5000}{69} = 72.46 \text{ mins}$$

$$\text{Diff.} = 83.33 - 72.46 = 10.87 \text{ or approx 10 minutes.}$$

74. (e) $(71 - 46)\%$ of $x = 120$

$$25\% \text{ of } x = 120$$

$$x = 120 \times \frac{100}{25}$$

$$= 480$$

$$30\% \text{ of } 480 = 144$$

75. (b) Percentage of income saved

$$= 100 - (45 + 30) = 25\%$$

$$\therefore 25\% \text{ of } x = 4500$$

$$x = 4500 \times \frac{100}{25}$$

$$= 18000$$

76. (a) No. of boys this year = $610 \times 80\% = 488$

$$\text{No. of girls} = 488 \times 175\% = 854$$

77. (c) Vidya scored = $350 + 296 = 646$
 76% of Max marks = 646
 \therefore Max marks = $646 \times \frac{100}{76} = 850$
78. (e) Let the marks originally awarded be x.
 $x - 40\%$ of $x = 96$
 $x - \frac{40x}{100} = 96$
 $\frac{60x}{100} = 96,$
 $\therefore x = \frac{96 \times 100}{60}$
 $x = 160.$
 Marks lost = $160 \times 40\% = 64$
79. (e) No. of candidates selected = $855 \times 20\% = 171$
80. (c) 98% of $250 = 245$ &
 32% of $750 = 240$
 $\therefore 32\%$ of $750 < 98\%$ of $250.$
81. (d) Marks scored by Mathew
 $= 42 + 51 + 58 + 35 + 48$
 $= 234$
 Max. Marks = $60 \times 5 = 300$
 Percentage scored = $\frac{234}{300} \times 100 = 78\%$
82. (a) Ratio of Expenses = $4 : 2 : 5,$
 therefore amount spend on clothes, i.e. $2x = 5540$
 $\therefore x = 2770$
 Total exp = $(4 + 2 + 5)x = 11x.$
 $= 11 \times 2770 = 30470$
 Total income be x.
 55% of $x = 30470$
 $x = 30470 \times \frac{100}{55} = 55400$
83. (e) Let the Ist number be x & the IInd number be y.
 35% of $x = 2 \times 75\%$ of y
 $\frac{35x}{100} = \frac{150y}{100}$
 $\frac{x}{y} = \frac{150}{35} = 30 : 7$
84. (e) $\frac{x + 20\% \text{ of } x}{y + 25\% \text{ of } y} = \frac{3}{5}$
 $\frac{120x}{100} \div \frac{125y}{100} = \frac{3}{5}$
 $\frac{120x}{100} \times \frac{100}{125y} = \frac{3}{5}$
 $\frac{x}{y} = \frac{3}{5} \times \frac{125}{120} = \frac{5}{8}$
85. (e) New Ratio = $[4 \times 125\% : 5 \times 130\% : 6 \times 150\%]$
 $= (5 : 6.5 : 9) \times 2 = 10 : 13 : 18$
86. (b) Let the number be x
 65% of $x - \frac{2x}{5} = 140$
 $\frac{65x}{100} - \frac{2x}{5} = 140$
 $\frac{65x - 40x}{100} = 140$
 $\frac{25x}{100} = 140$
 $x = 140 \times \frac{100}{25} = 560$
 30% of $560 = 168.$
87. (a) Percentage savings of Sonali = $100 - (15 + 55) = 30\%$
 Let her monthly income be x
 $x \times \frac{30}{100} = 12750$
 $x = 12750 \times \frac{100}{30} = 42,500$
88. (a) Percentage savings of Mr. Davar = $100 - (38 + 25 + 12) = 25\%$
 Let his monthly income be x
 25% of $x = 5800$
 $x = 5800 \times \frac{100}{25} = 23,200$
89. (e) $(72 - 56)\%$ of $x = 56$
 16% of $x = 56$
 $x = 56 \times \frac{100}{16} = 350$
 70% of $350 = 245$
90. (b) Percentage of money left with Nand Kishore
 $= 100 - (50 + 35) = 15\%$
 15% of $x = 11250$
 $x = 11250 \times \frac{100}{15} = 75,000$
91. (c) $SI = \frac{30,000 \times 3 \times 5}{100} = 4500$
 $x\%$ of $22,500 = 4500$
 $\frac{x}{100} \times 22,500 = 4500$
 $x = \frac{4500 \times 100}{22,500} = 20\%$
92. (c) Let the number be x
 15% of $x + 10\%$ of $x = 70.$
 25% of $x = 70$
 $x = 70 \times \frac{100}{25} = 280$
 Twice of that number = $280 \times 2 = 560.$

93. (b) Total marks = 500
 Marks scored by Vikram = $500 \times 72\% = 360$
 Marks scored in Science
 $= 360 - [80 + 70 + 76 + 65] = 69$
94. (a) Priya fails by $(975 - 870)$
 $= 105$ marks
 So, 7% of max marks = 105
 $\therefore \text{Max. Marks} = 105 \times \frac{100}{7} = 1500$
95. (e) $\frac{6x}{11} = \frac{22y}{100}$
 $y = \frac{1z}{4}$, but $z = 2400$ (given)
 $\therefore y = 1 \times \frac{2400}{4} = 600$
 So, $\frac{6x}{11} = \frac{22 \times 600}{100} = 132$
 $x = 132 \times \frac{11}{6} = 242$
 $45\% \text{ of } 242 = 108.9$
96. (d) Male employees less than 25 years of age
 $= 4800 \times \frac{45}{100} \times \frac{40}{100}$
 $= 864$
 ($\therefore 60\%$ are above 25, therefore it implies that 40% are below 25)
97. (c) Win percentage = $\frac{24}{40} \times 100 = 60\%$
98. (b) Sonia's score = $75 - 10 = 65$
 Rohit's score = $65 + 45 = 110$
 Raman's score = $110 - 25 = 85$
 Ravi's score = $85 + 34 = 119$
 Max. Marks = $119 + 50 = 169$
 Percentage marks of Ravi = $\frac{119}{169} \times 100$
 $= 70.4 \sim 70\%$
99. (b) Let Mr. Giridhr's income tax
 $\left(x - \frac{50x}{100}\right) \left(1 - \frac{(50 + 25 + 10)}{100}\right) = 900$
 $\frac{50x}{100} \times \frac{15}{100} = 900$
 $x = \frac{900 \times 100 \times 100}{50 \times 15} = 12,000$
100. (e) $x + x + 1 + x + 2 = 2262$
 $3x + 3 = 2262$
 $3x = 2262 - 3 = 2259$
 $x = \frac{2259}{3} = 753$
 Highest number = $753 + 2 = 755$
 $41\% \text{ of } 755 = 309.55$
101. (b) Marks scored in subject B = $150 \times 56\% = 84$
 Total marks scored in all the 3 subjects
 $= (150 \times 3) \times 54\% = 243$
 Marks scored in subject C = $243 - 73 - 84 = 86$

SIMPLE & COMPOUND INTEREST

CHAPTER 5

INTEREST

Basic terms associated with this topic:

Interest : It is the time value of money. It is the cost of using capital.

Principal : It is the borrowed amount.

Amount : It is the sum total of Interest and Principal.

Rate : It is the rate percent payable on the amount borrowed.

Period: It is the time for which the principal is borrowed.

Interest can be classified as: Simple interest : Simple Interest is payable on principal.

Compound Interest: Compound Interest is payable on Amount.

Basic formulas related to Simple Interest

$$\text{Simple Interest (SI)} = \frac{P \times R \times T}{100}$$

Here P = principal, R = rate per annum, T = time in years

$$\text{Amount (A)} = P + \frac{PRT}{100} = P \left(1 + \frac{RT}{100} \right) \text{ or } P + \text{SI}$$

If time is given in months, & Rate is given per annum,

$$\text{then SI} = \frac{P \times R \times T}{12 \times 100}$$

If time is given in weeks, & Rate is given per annum,

$$\text{Then SI} = \frac{P \times R \times T}{52 \times 100}$$

If time is given in days, & Rate is given per annum,

$$\text{then SI} = \frac{P \times R \times T}{365 \times 100}$$

❖ Also,

$$\text{Rate} = \frac{\text{SI} \times 100}{P \times T}$$

$$\text{Time} = \frac{\text{SI} \times 100}{P \times R}$$

$$\text{Principal} = \frac{\text{SI} \times 100}{R \times T}$$

If amount is given then,

$$\text{Principal} = \frac{\text{Amt} \times 100}{100 + (R \times T)}$$

ILLUSTRATION 1 : Find the simple interest and amount when ₹ 1000 is lent at 5% per annum for 5 years.

$$\text{Sol. By the formula, SI} = \frac{P \times R \times T}{100} = \frac{1000 \times 5 \times 5}{100} = ₹ 60$$

$$\therefore \text{Amount} = P + \text{SI} = 1000 + 60 = ₹ 1060$$

ILLUSTRATION 2 : Find the principal when simple interest is ₹ 60 at 4% per annum for 4 years.

$$\text{Sol. Principal} = \frac{\text{SI} \times 100}{R \times T} = \frac{60 \times 100}{4 \times 4} = ₹ 750$$

ILLUSTRATION 3 : In how many years will the sum of ₹ 500 become ₹ 620 if the rate of simple interest is 4% per annum?

Sol. Using the formula,

$$T = \frac{\text{SI} \times 100}{R \times P}$$

$$\text{Here, SI} = 620 - 500 = ₹ 120$$

$$\therefore T = \frac{120 \times 100}{500 \times 4} = 6 \text{ years}$$

ILLUSTRATION 4 : At what rate percent per annum will a sum of money double in 8 years?

Sol. Let principal = ₹ P

$$\text{Then SI} = ₹ P$$

$$\text{and Time} = 8 \text{ years}$$

$$\therefore \text{Rate} = \frac{\text{SI} \times 100}{P \times T}$$

$$= \frac{P \times 100}{P \times 8} = \frac{100}{8}$$

$$= \frac{25}{2} = 12\frac{1}{2} \% \text{ per annum}$$

Basic formulas related to Compound Interest

If interest is compounded annually,

$$\text{Amt} = P \left(1 + \frac{R}{100} \right)^N$$

If interest is compounded half yearly,

$$\text{Amount} = P \left(1 + \frac{R}{200} \right)^{2N}$$

If interest is compounded quarterly,

$$\text{Amount} = P \left(1 + \frac{R}{400} \right)^{4N}$$

If the rate of interest changes over the years, then

$$\text{Amount} = P \left(1 + \frac{R_1}{100} \right) \left(1 + \frac{R_2}{100} \right) \dots$$

Compound Interest for all the above cases = Amt – Principal.
Difference between C.I &

$$\text{SI for two years} = P \left(\frac{R}{100} \right)^2$$

$$\text{Difference between CI \& SI for three years} = \frac{PR^2(300 + R)}{(100)^3}$$

ILLUSTRATION 5 : Find the compound interest on ₹ 2000 at 5% per annum for 3 years, compound annually.

Sol. Compound interest = Principal $\left[\left(1 + \frac{\text{Rate}}{100} \right)^{\text{Time}} - 1 \right]$

$$= 2000 \left[\left(1 + \frac{5}{100} \right)^3 - 1 \right]$$

$$= 2000 \left[\left(\frac{21}{20} \right)^3 - 1 \right] = 2000 \left[\frac{9261 - 8000}{8000} \right]$$

$$= 2000 \times \frac{1261}{8000} = ₹ 315.25$$

ILLUSTRATION 6 : Find the compound interest on ₹ 5000 for 3 years at 6% per annum compounded half yearly.

Sol. Using the formula, $A = P \left[1 + \left(\frac{R}{200} \right)^{2T} \right]$

$$= 5000 \left[1 + \left(\frac{6}{200} \right)^{3 \times 2} \right]$$

$$= 5000 (1.03)^6 = 5971 \text{ (to nearest rupee)}$$

Compound interest = 5971 - 5000 = ₹ 971

ILLUSTRATION 7 : Find the compound interest on ₹ 51200 for 9 months at 15% per annum compounded quarterly.

Sol. Here, Time = 9 months = 3 quarters
Now, using the formula

$$A = P \left[1 + \left(\frac{R}{400} \right)^{4T} \right] = 51200 \times \left[1 + \frac{15}{400} \right]^3$$

$$= 51200 \times \left(400 + \frac{15}{400} \right)^3 = 51200 \times \left(\frac{415}{400} \right)^3$$

$$= 51200 \times \frac{83}{80} \times \frac{83}{80} \times \frac{83}{80}$$

$$= ₹ 57178.70$$

$$\therefore \text{C.I.} = ₹ (57178.70 - 51200)$$

$$= ₹ 5978.70$$

ILLUSTRATION 8 : Find the compound interest on ₹ 5000 for 3 years at 6% per annum for first year, 7% for the second year and 8% for the third year

Sol. Using the formula,

$$= P \left\{ 1 + \frac{R_1}{100} \right\} \left\{ 1 + \frac{R_2}{100} \right\} \left\{ 1 + \frac{R_3}{100} \right\}$$

$$\left(1 + \frac{6}{100} \right) \left(1 + \frac{7}{100} \right) \left(1 + \frac{8}{100} \right)$$

$$= ₹ 6125$$

$$\therefore \text{C.I.} = 6125 - 5000 = ₹ 1125$$

ILLUSTRATION 9 : The compound interest on ₹ 3000 in 2 years is ₹ 696.30 and simple interest on the same amount is ₹ 660. What is rate of interest per annum?

Sol. Difference of interest = $P \left(\frac{R}{100} \right)^2$

$$\Rightarrow 696.30 - 660 = 3000 \left(\frac{R}{100} \right)^2$$

$$\Rightarrow \frac{12.1}{1000} = \frac{R^2}{10000}$$

$$\Rightarrow R^2 = 121 \Rightarrow R = 11\%$$

ILLUSTRATION 10 : The difference between compound interest and simple interest on a certain sum of money in 3 years at the rate of 7% per annum is ₹ 225.645. What is the principal?

Sol. Difference of interest = $P \frac{R^2(300 + R)}{(100)^3}$

$$\Rightarrow 225.645 = P \times \frac{(7)^2(300 + 7)}{(100)^3}$$

$$\Rightarrow P = \frac{225.645 \times 100 \times 100 \times 100}{49 \times 307}$$

$$= ₹ 15000$$

ILLUSTRATION 11 : A person has taken a loan amount at the rate of 10% annual compound interest and he pays that amount in two instalments of ₹ 968 each. How much loan did he take?

Sol. Loan taken = $\frac{968}{\left(1 + \frac{10}{100} \right)^1} + \frac{968}{\left(1 + \frac{10}{100} \right)^2}$

$$= 968 \left[\frac{1}{\left(\frac{11}{10} \right)} + \frac{1}{\left(\frac{11}{10} \right)^2} \right] = 968 \left[\frac{10}{11} + \left(\frac{10}{11} \right)^2 \right]$$

$$= 968 \left[\frac{10 \times 11 + 10 \times 10}{121} \right] = 968 \left[\frac{10(11+10)}{11 \times 11} \right]$$

$$= 968 \times \frac{10}{11} \times \frac{21}{11} = ₹1680$$

ILLUSTRATION 12: A sum of money doubles itself in 5 years.

Find the simple rate of interest.

Sol:

Let the sum of money, i.e.

$$P = 100$$

It doubles itself, i.e.

$$\text{Amt} = 200$$

$$\text{SI} = \text{Amt} - \text{Principal}$$

$$= 200 - 100 = 100$$

$$\text{Time} = 5 \text{ years.}$$

$$\text{Rate} = \frac{\text{SI} \times 100}{P \times T}$$

$$= \frac{100 \times 100}{100 \times 5} = 20\%$$

Alternately

In these types of questions,

$$\text{Rate} = \frac{(\text{No. of time} - 1) \times 100}{\text{Time}}$$

$$= \frac{(2-1)100}{5}$$

$$= \frac{100}{5} = 20\%$$

The same formula can even be applied for finding time in the above pattern of question.

ILLUSTRATION 13: Mohan borrows ₹10,000 @ 8% pa for 4 years. At the end of the period, he pays ₹6000 in cash, and for the balance amount, he gave his mobile. Find the cost of the mobile.

Sol:

$$\text{SI} = \frac{P \times R \times T}{100} = \frac{10,000 \times 8 \times 4}{100} = 3200$$

$$\text{Amount} = P + \text{SI} = 10,000 + 3200 = 13,200$$

$$\text{Cost of Mobile} = 13,200 - 6000 = 7200$$

ILLUSTRATION 14: Mohan borrows ₹10,000 from two money lenders at a rate of 6% pa and 8% pa respectively, for a period of 3 years. If the total interest he paid was ₹1980, find the amount borrowed at the rate of 6% pa.

Sol:

Let the amount borrowed at 6% pa be x , and the amount borrowed at 8% be y .

$$\text{So, } x + y = 10,000 \dots (i)$$

Now,

$$\text{SI} = \frac{x \times 6 \times 3}{100} = \frac{18x}{100}, \text{ and}$$

$$\text{Also SI} = \frac{y \times 8 \times 3}{100} = \frac{24y}{100}.$$

According to the condition,

$$\frac{18x}{100} + \frac{24y}{100} = 1980 \text{ or}$$

$$18x + 24y = 198000 \dots (ii).$$

On equating (i) and (ii), we get

$$x = 7000 \text{ and}$$

$$y = 3000.$$

Therefore, amount borrowed @6% pa = 7000.

SOLVED EXAMPLES

EXAMPLE 1: What would be the simple interest obtained on an amount of ₹ 6,535 at the rate of 10% p.a. after 6 years?

- (a) ₹ 3414 (b) ₹ 3921
(c) ₹ 3807 (d) ₹ 3149
(e) None of these

$$\begin{aligned} \text{Sol. (b) Simple interest} &= \frac{P \times R \times T}{100} \\ &= \frac{6535 \times 6 \times 10}{100} = ₹ 3921 \end{aligned}$$

EXAMPLE 2: What would be the compound interest obtained on an amount of ₹ 7800 at the rate of 5% p.a. after 3 years?

- (a) ₹ 1235.685 (b) ₹ 1229.475
(c) ₹ 1287.68 (d) ₹ 1248.750
(e) None of these

$$\begin{aligned} \text{Sol. (b) Compound interest} &= 7800 \left[\left(1 + \frac{5}{100} \right)^3 - 1 \right] \\ &= 7800 \left[\left(\frac{105}{100} \right)^3 - 1 \right] \\ &= 7800 \left[\frac{105 \times 105 \times 105 - 100 \times 100 \times 100}{100 \times 100 \times 100} \right] \\ &= (7800 \times 0.157625) \\ &= ₹ 1229.475 \end{aligned}$$

EXAMPLE 3: If the difference between the simple and the compound interest earned on a sum of money at the rate of 5% p.a. for 2 years is ₹ 16, find the principal.

- (a) ₹ 6,200 (b) ₹ 6,400
(c) ₹ 6,250 (d) Cannot be determined
(e) None of these

Sol. (b) If the difference between CI and SI for two years is given, then

$$\text{Principal} = \frac{\text{Difference} \times (100)^2}{(\text{Rate})^2}$$

$$= \frac{16 \times 100 \times 100}{5 \times 5} = ₹ 6400$$

EXAMPLE 4: The simple interest accrued on an amount of ₹ 19,800 at the end of three years is ₹ 7,128. What would be the compound interest accrued on the same amount at the same rate in the same period?

- (a) ₹ 8934.6784 (b) ₹ 8017.5744
(c) ₹ 7861.8754 (d) Cannot be determined
(e) None of these

Sol. (b) Rate = $\frac{\text{Interest} \times 100}{\text{Principal} \times \text{Time}} = \frac{7128 \times 100}{19800 \times 3} = 12\% \text{ p.a.}$

$$\text{C.I.} = \text{Principal} \left[\left(1 + \frac{\text{Rate}}{100} \right)^{\text{Time}} - 1 \right]$$

$$= 19800 \left[\left(1 + \frac{12}{100} \right)^3 - 1 \right]$$

$$= 19800 [(1.12)^3 - 1] \\ = ₹ 8017.5744$$

EXERCISE

- Anil invested an amount for three year at a simple interest rate of 9% p.a. He got an amount of ₹ 19,050 at the end of three years. What principal amount did he invest?

(a) ₹ 14,500 (b) ₹ 11,050
(c) ₹ 1,440 (d) ₹ 10,950
(e) None of these
- What will be the compound interest on an amount of ₹ 5,000 for a period of 2 year at 8% p.a?

(a) ₹ 840 (b) ₹ 400
(c) ₹ 823 (d) ₹ 416
(e) None of these
- What is the interest received on a principal of ₹ 450 for 2 year if the interest received on ₹ 1 after four year at the same rate of simple interest is ₹ 0.40?

(a) ₹ 90 (b) ₹ 180
(c) ₹ 36 (d) Cannot be determined
(e) None of these
- Ms. Sandhya deposits an amount of ₹ 31,400 to obtain a simple interest at the rate of 12 per cent per annum for 8 years. What total amount will Ms. Sandhya get at the end of 8 years?

(a) ₹ 31,444 (b) ₹ 61,544
(c) ₹ 41,544 (d) ₹ 31,144
(e) None of these
- What amount of compound interest can be obtained on the

- principal amount of ₹ 15800 at the rate of 6 per cent per annum at the end of 2 year ?
- (a) ₹ 1,986 (b) ₹ 2,012.48
(c) ₹ 1,952.88 (d) ₹ 1,956
(e) None of these
6. Mr. Deepak invested an amount of ₹ 21,250 for 6 years. At what rate of simple interest will he obtain the total amount of ₹ 26,350 at the end of 6 years?
- (a) 6% p.a (b) 5% p.a
(c) 8% p.a (d) 12% p.a
(e) None of these
7. What approximate amount of compound interest can be obtained on an amount of ₹ 3,080 at the rate of 7% p.a. at the end of 3 year ?
- (a) ₹ 586 (b) ₹ 693
(c) ₹ 646 (d) ₹ 596
(e) ₹ 621
8. Arunima invests an amount of ₹ 10,250 @ 4% p.a. to obtain a total amount of ₹ 12,710 on simple interest after a certain period. For how many year did she invest the amount to obtain the total sum?
- (a) 6 years (b) 8 years
(c) 5 years (d) 4 years
(e) None of these
9. Sudhanshu invested ₹ 15,000 at interest @ 10% p.a for one year. If the interest is compounded every six months what amount will Sudhanshu get at the end of the year?
- (a) ₹ 16,537.50 (b) ₹ 16,5000
(c) ₹ 16,525.50 (d) ₹ 18,150
(e) None of these
10. What should be the simple interest obtained on an amount of ₹ 5,760 at the rate of 6% p.a. after 3 years?
- (a) ₹ 1036.80 (b) ₹ 1666.80
(c) ₹ 1336.80 (d) ₹ 1063.80
(e) None of these
11. Ms Suchi deposits an amount of ₹ 24,000 to obtain a simple interest at the rate of 14% p.a. for 8 years. What total amount will Ms Suchi get at the end of 8 years?
- (a) ₹ 52080 (b) ₹ 28000
(c) ₹ 50880 (d) ₹ 26880
(e) None of these
12. Asmita invests an amount of ₹ 9535 at the rate of 4 per cent per annum to obtain a total amount of ₹ 11442 on simple interest after a certain period. For how many year did she invest the amount to obtain the total sum?
- (a) 10 years (b) 2 years
(c) 5 years (d) 4 years
(e) None of these
13. Ms. Neelam deposits an amount of ₹ 16420 at simple interest and obtained ₹ 25451 at the end of 5 years. What was the rate of interest per year?
- (a) 10.5% (b) 13%
(c) 12.5% (d) 11%
(e) None of these
14. Girish invested a certain amount at the rate of 8% p.a. for 6 year to obtain an amount of ₹ 28,046. How much amount did Girish obtain as simple interest?
- (a) ₹ 12,550 (b) ₹ 9,096
(c) ₹ 18,950 (d) Cannot be determined
(e) None of these
15. Ms. Maya deposits an amount of ₹ 17,800 and obtained ₹ 31,684 at the end of 6 years. What was the rate of simple interest per year?
- (a) 14.5 (b) 11
(c) 12.5 (d) 13
(e) None of these
16. The simple interest accrued on an amount of ₹ 84,000 at the end of three year is ₹ 30,240. What would be the compound interest accrued on the same amount at the same rate in the same period?
- (a) ₹ 30,013.95 (b) ₹ 31,013.95
(c) ₹ 32,013.95 (d) ₹ 33,013.95
(e) ₹ 34,013.95
17. Veena obtained an amount of ₹ 8,376/- as simple interest on a certain amount at 8% p.a. after 6 years. What is the amount invested by Veena?
- (a) ₹ 17,180 (b) ₹ 18,110
(c) ₹ 16,660 (d) ₹ 17,450
(e) None of these
18. What will be the difference between the compound interest and simple interest at the rate of 5% p.a. on an amount of ₹ 4,000 at the end of two years?
- (a) ₹ 10 (b) ₹ 20
(c) ₹ 30 (d) Data inadequate
(e) None of these
19. If the compound interest accrued on an amount of ₹ 14,500 in two year is ₹ 4676.25, what is the rate of interest % p.a. ?
- (a) 11 (b) 9
(c) 15 (d) 18
(e) None of these
20. The compound interest accrued on an amount of ₹ 25,500 at the end of three year is ₹ 8,440.5. What would be the simple interest accrued on the same amount at the same rate in the same period?
- (a) ₹ 4,650 (b) ₹ 5,650
(c) ₹ 6,650 (d) ₹ 7,650
(e) None of these
21. The simple interest obtained on an amount of ₹ 45,000 at the end of 4 year is ₹ 15,300. What would be the approximate compound interest obtained on the same amount at the same rate of interest in the same period ?
- (a) ₹ 18,244 (b) ₹ 18,244
(c) ₹ 16,285 (d) ₹ 18,566
(e) ₹ 17,364
22. The simple interest accrued on a sum of certain principal is ₹ 1,200 in four year at the rate of 8% p.a. What would be the simple interest accrued on thrice of that principal at the rate of 6% p.a in 3 year ?

- (a) ₹ 2,025 (b) ₹ 3,025
(c) ₹ 2,250 (d) ₹ 2,150
(e) None of these
23. What would be the simple interest accrued in 4 years on a principal of ₹ 16,500 at the rate of 16 p.c.p.a?
(a) 11,560 (b) 10,250
(c) 12,500 (d) 9,980
(e) None of these
24. What is the difference between the C.I. and S.I. accrued on an amount of ₹ 12,000 at the end of three years at the rate of 12%?
(a) 539.136 (b) 602.242
(c) 495.248 (d) 488.322
(e) None of these
25. What amount of C.I. can be obtained on an amount of ₹ 8,840 at the rate of 5 p.c. p.a. at the end of 3 years?
(a) 1393.405 (b) 1326
(c) 1384.50 (d) 1340
(e) None of these
26. What is the C.I. accrued on an amount of ₹ 8500 in two years @ 10 p.c.p.a. interest?
(a) 1875 (b) 1885
(c) 1775 (d) 1765
(e) None of these
27. S.I. accrued on an amount in 8 years at the rate of 12 p.c.p.a. is ₹ 5520. What is the principal?
(a) 5750 (b) 8500
(c) 5650 (d) 8250
(e) None of these
28. How much will be the C.I. to be paid on a principal amount of ₹ 85,000 after 3 years at the rate of 6 p.c.p.a?
(a) 16623.36 (b) 16236.36
(c) 16326.36 (d) 16632.36
(e) None of these
29. In how many years will ₹ 4600 amount to ₹ 5428 at 3 p.c.p.a. simple interest?
(a) 3 (b) 5
(c) 6 (d) 4
(e) None of these
30. The S.I. accrued on a sum of certain principal in 8 years at the rate of 13% per year is ₹ 6500. What would be the C.I. accrued on that principal at the rate of 8% per year in 2 years?
(a) ₹ 1040 (b) ₹ 1020
(c) ₹ 1060 (d) ₹ 1200
(e) None of these
31. Amount of S.I. accrued on an amount of ₹ 28,500 in seven years is ₹ 23940. What is the rate of interest per annum?
(a) 10.5 (b) 12.5
(c) 11 (d) 12
(e) None of these
32. Mr. Sharma invested an amount of ₹ 25,000 in fixed deposit @ 8% p.a. C.I. for two years. What amount Mr. Sharma will get on maturity?
(a) 28540 (b) 29160
(c) 29240 (d) 28240
(e) None of these
33. S.I. accrued on an amount in eight years @ 11% p.a. is 57200. What was the principal amount?
(a) 72000 (b) 82000
(c) 75000 (d) 65000
(e) None of these
34. What is C.I. accrued on an amount of ₹ 45,000 in two years at the rate of 9 p.c.p.a?
(a) 8600 (b) 8565.40
(c) 8464.50 (d) 8540
(e) None of above
35. A principal of ₹ 10,000 after 2 years compounded annually, the rate of interest being 10% p.a. during the first year and 12% p.a. during the second year will amount to:
(a) 12,000 (b) 12,320
(c) 12,500 (d) 11,320
36. What is the difference between the S.I. & C.I. on 7300 at the rate of 6 p.c.p.a. in 2 years?
(a) ₹ 29.37 (b) 26.28
(c) 31.41 (d) 23.22
(e) 21.34
37. A sum of money becomes 3 times in 5 years. In how many years will the same sum becomes 6 times at the same rate of SI?
(a) 10 years (b) 12 years
(c) $12\frac{1}{2}$ years (d) 13 years
(e) None of these
38. A certain sum becomes $\frac{7}{3}$ times itself in 10 years under S.I. Find the rate of interest.
(a) $7\frac{1}{2}$ % (b) 20%
(c) 10% (d) $13\frac{1}{3}$ %
(e) None of these
39. An amount is lent at y% p.a. S.I. for two years. However, is it had been lent at 2y% p.a. S.I. for x more years, then the interest would have been 5 times the earlier interest. Find the value of y.
(a) 2 (b) 3
(c) 4 (d) 5
(e) None of these
40. According to a new plan declared by the CSIR Bank, the rate of simple interest on a sum of money is 6% p.a. for the first two years, 8% p.a. for the next three years and 10% p.a. for the period beyond first 5 years. Simple interest accrued on a sum for a period of 8 years is ₹ 6600. Find the sum.
(a) 24,000 (b) 16,000
(c) 10,000 (d) 15,000
(e) None of the above
41. Rahul has borrowed Rs. 20,000 from two money tenders. On one he had to pay 8% p.a. S.I. and on the other amount he

- had to pay 12% p.a. SI. After 3 years, he paid total interest of ₹5760, find the amount borrowed at 12% p.a.
- (a) 12,000 (b) 8000
(c) 5000 (d) 10,000
(e) 6000
42. Mohan borrowed ₹18,000 at 10% p.a. simple interest and then lend it to Sohan at 10% C.I. After 3 years he will earn a profit of
- (a) 558 (b) 555
(c) 560 (d) 600
(e) None of the above
43. A sum of money borrowed at 10% p.a. for two years at compound interest amounts to ₹ 14520. Find the sum borrowed.
- (a) 10,000 (b) 11,000
(c) 12,000 (d) 13,000
(e) None of the above
44. Surya borrowed ₹25,000 @ 15% p.a. S.I. for 5 years. After 5 years he repaid ₹ 15,000 and promised to pay the balance amount after 3 years. Find the amount repayable as final settlement.
- (a) 26,000 (b) 32,000
(c) 20,100 (d) 41687.5
(e) None of the above
45. Kamakshi was in need of funds. So, she borrowed ₹ 50,000 at the rate of 8 p.c. p.a. S.I. After 2 years, she was unable to pay back the amount. Therefore, she gave her bike to repay back the loan. Find the price of the bike.
- (a) 60,000 (b) 58,000
(c) 55,000 (e) 62,000
(e) None of the above

Answer Key

1	(e)	11	(c)	21	(e)	31	(d)	41	(a)
2	(e)	12	(c)	22	(a)	32	(b)	42	(a)
3	(a)	13	(d)	23	(e)	33	(d)	43	(c)
4	(b)	14	(b)	24	(a)	34	(c)	44	(d)
5	(c)	15	(d)	25	(a)	35	(b)	45	(b)
6	(e)	16	(e)	26	(e)	36	(b)		
7	(b)	17	(d)	27	(a)	37	(c)		
8	(a)	18	(a)	28	(b)	38	(d)		
9	(a)	19	(c)	29	(c)	39	(b)		
10	(a)	20	(d)	30	(a)	40	(c)		

ANSWERS & EXPLANATIONS

1. (e) Let the principal be = ₹x
 \therefore Interest = $(19050 - x)$
 Now,

$$\text{Principal} = \frac{\text{Interest} \times 100}{\text{Time} \times \text{Rate}}$$

$$\Rightarrow x = \frac{(19050 - x) \times 100}{3 \times 9}$$

$$\Rightarrow 27x = 1905000 - 100x$$

$$\Rightarrow 127x = 1905000$$

$$\Rightarrow x = \frac{1905000}{127} = ₹15000$$
2. (e) Amount = Principal $\left(1 + \frac{\text{Rate}}{100}\right)^{\text{Time}}$

$$= 5000 \left(1 + \frac{8}{100}\right)^2 = 5000 \left(1 + \frac{2}{25}\right)^2$$
3. (a) Interest on ₹ 1 in 4 years = ₹ 0.4
 \therefore Interest on ₹ 100 in 4 years = ₹ 40
 \therefore Interest on ₹ 100 in 1 year = ₹ 10
 \therefore Interest = $\frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$$= \frac{450 \times 2 \times 10}{100} = ₹ 90$$
4. (b) Simple Interest = $\frac{P \times R \times T}{100}$

$$\frac{31400 \times 8 \times 12}{100} = ₹ 30144$$
 \therefore Required amount = ₹ (31400 + 30144)
 = ₹ 61544

$$5. (c) \text{ Compound Interest} = P \left[\left(1 + \frac{R}{100} \right)^T - 1 \right]$$

$$= 15800 \left[\left(1 + \frac{6}{100} \right)^2 - 1 \right]$$

$$= 15800 \times [(1.06)^2 - 1]$$

$$= 15800 \times (1.1236 - 1)$$

$$= 15800 \times 0.1236$$

$$= ₹ 1952.88$$

$$6. (e) \text{ Rate} = \frac{(26350 - 21250) \times 100}{21250 \times 6} = \frac{510000}{127500} = 4\%$$

7. (b) Compound Interest

$$= 3080 \left[\left(1 + \frac{7}{100} \right)^3 - 1 \right]$$

$$= 3080 \left[\left(\frac{107}{100} \right)^3 - 1 \right]$$

$$= 3080 \times \left[\frac{1225043 - 1000000}{1000000} \right]$$

$$= 3080 \times \frac{225043}{1000000}$$

$$= ₹ 693 \text{ (approximate)}$$

$$8. (a) \text{ SI} = ₹ (12710 - 10250) = ₹ 2460$$

$$\text{time} = \frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Rate}} = \frac{2460 \times 100}{10250 \times 4} = 6 \text{ years}$$

$$9. (a) \text{ Required Amount} = 15000 \left(1 + \frac{5}{100} \right)^2 = ₹ 16537.50$$

$$10. (a) \text{ Required Simple Interest} = \frac{5760 \times 3 \times 6}{100} = ₹ 1036.80$$

$$11. (c) \text{ Required Amount} = 24000 \left(1 + \frac{14 \times 8}{100} \right)$$

$$= 24000 \times \frac{212}{100} = ₹ 50880$$

12. (c) Let the required time = t years

$$\text{Simple interest} = (11442 - 9535) = ₹ 1907$$

$$\text{Simple} = \frac{P \times T \times R}{100}$$

$$1907 = \frac{9535 \times 4 \times t}{100}$$

$$\therefore t = \frac{1907 \times 100}{9535 \times 4} = 5 \text{ years}$$

$$13. (d) \text{ Interest} = (25451 - 16420) = ₹ 9031$$

$$\text{Rate} = \frac{\text{Interest} \times 100}{\text{Principal} \times \text{Time}}$$

$$\frac{9031 \times 100}{16420 \times 5} = 11\%$$

14. (b) Let the principal be = ₹ 100

\therefore Simple interest

$$= \frac{100 \times 8 \times 6}{100} = ₹ 48$$

$$\therefore \text{Amount} (100 + 48) = ₹ 148$$

$$\therefore \text{When the amount is} = ₹ 148, \text{ the principal} = ₹ 100$$

$$\therefore \text{When amount} = ₹ 28046, \text{ the principal}$$

$$= \frac{100}{48} \times 28046 = ₹ 18950$$

$$\therefore \text{Simple interest} = (₹ 28046 - 18950) = ₹ 9096$$

$$15. (d) \text{ Rate of Interest} = \frac{(31684 - 17800) \times 100}{17800 \times 6} \%$$

$$= \frac{1388400}{106800} = 13\%$$

$$16. (e) \text{ Rate} = \frac{30240 \times 100}{84000 \times 3} = 12\%$$

Compound interest

$$= 84000 \left(1 + \frac{12}{100} \right)^3 - 84000$$

$$= 118013.95 - 84000$$

$$= ₹ 34013.95$$

$$17. (d) \text{ Amount invested} = \frac{8376 \times 100}{8 \times 6} = ₹ 17450$$

18. (a) Simple interest

$$= \frac{4000 \times 5 \times 2}{100} = ₹ 400$$

Compound interest

$$= 4000 \left(1 + \frac{5}{100} \right)^2 - 4000$$

$$= \frac{4000 \times 105 \times 105}{100 \times 100} - 4000$$

$$= 4410 - 4000 = ₹ 410$$

$$\therefore \text{Difference} = 410 - 400$$

$$= ₹ 10$$

$$19. (e) 14500 \left(1 + \frac{r}{100} \right)^2$$

$$= 14500 + 4676.25$$

$$\Rightarrow \left(1 + \frac{r}{100} \right)^2 = \frac{19176.25}{14500} = \frac{529}{400}$$

$$\Rightarrow \left(1 + \frac{r}{100}\right)^2 = \left(\frac{23}{20}\right)^2$$

$$\Rightarrow 1 + \frac{r}{100} = \frac{23}{20}$$

$$\Rightarrow \frac{r}{100} = \frac{23}{20} - 1 = \frac{3}{20}$$

$$\Rightarrow r = \frac{100 \times 3}{20} = 15$$

$$20. (d) \quad 25500 \left(1 + \frac{r}{100}\right)^3 - 25500$$

$$= 8440.5$$

$$\Rightarrow 25500 \left(1 + \frac{r}{100}\right)^3$$

$$= 8440.5 + 25500$$

$$\Rightarrow \left(1 + \frac{r}{100}\right)^3 = \frac{33940.5}{25500}$$

$$= \frac{1331}{1000} = \left(\frac{11}{10}\right)^3$$

$$\Rightarrow \left(1 + \frac{r}{100}\right) = \left(\frac{11}{10}\right)$$

$$\Rightarrow 1 + \frac{r}{100} = \frac{11}{10}$$

$$\Rightarrow \frac{r}{100} = \frac{11}{10} - 1 = \frac{1}{10}$$

$$\Rightarrow r = \frac{100}{10} = 10$$

∴ Simple interest

$$= \frac{25500 \times 10 \times 3}{100}$$

$$= ₹ 7650$$

$$21. (e) \quad \text{Rate} = \frac{15300 \times 100}{45000 \times 4} = 8.5\%$$

Compound interest

$$= 45000 \left(1 + \frac{8.5}{100}\right)^4 - 45000$$

$$= 45000 \left\{ \left(\frac{108.5}{100}\right)^4 - 1 \right\}$$

$$= 45000 \times 0.3858 = ₹ 17364 \text{ (approx)}$$

22. (a) Principal

$$= \frac{1200 \times 100}{4 \times 8}$$

$$= ₹ 3750$$

Simple interest on thrice that principal

$$= \frac{3750 \times 3 \times 6 \times 3}{100}$$

$$= ₹ 2025$$

23. (e) Simple interest

$$\frac{\text{principle} \times \text{time} \times \text{rate}}{100} = \frac{16500 \times 4 \times 16}{100} = ₹ 10560$$

24. (a) S.I. = $\frac{\text{principle} \times \text{time} \times \text{rate}}{100}$

$$= \frac{12000 \times 3 \times 12}{100} = ₹ 4320$$

$$\text{C.I.} = P \left[\left(1 + \frac{\text{rate}}{100}\right)^{\text{time}} - 1 \right]$$

$$= 12000 \left[\left(1 + \frac{12}{100}\right)^3 - 1 \right]$$

$$= 12000 \left[\left(\frac{28}{25}\right)^3 - 1 \right]$$

$$= 12000 \left[\frac{21952}{15625} - 1 \right]$$

$$= 12000 \times \frac{6327}{15625} = ₹ 4859.136$$

$$\therefore \text{Required difference} = 4859.136 - 4320 = ₹ 539.136$$

$$25. (a) \quad \text{Amt} = 8840 \left(1 + \frac{5}{100}\right)^3 = 10233.405$$

$$\text{CI} = \text{Amt} - \text{Principal}$$

$$= 10233.405 - 8840$$

$$= 1393.405$$

$$26. (e) \quad \text{Amt} = 8500 \left(1 + \frac{10}{100}\right)^2 = 10285$$

$$\text{CI} = 10285 - 8500$$

$$= 1785$$

$$27. (a) \quad \text{Principal} = \frac{\text{SI} \times 100}{R \times T} = \frac{5520 \times 100}{12 \times 8} = 5750$$

$$28. (b) \quad \text{Amt} = 85000 \left(1 + \frac{6}{100}\right)^3 = 101236.36$$

$$\text{CI} = 101236.36 - 85000 = 16236.36$$

$$29. (c) \quad \text{Time} = \frac{\text{S.I.} \times 100}{P \times R} = \frac{828 \times 100}{4600 \times 3}$$

$$= 6 \text{ years}$$

$$\text{SI} = \text{Amt} - \text{principal} = 5428 - 4600 = 828$$

$$30. (a) \text{ Principal} = \frac{\text{SI} \times 100}{R \times T} = \frac{6500 \times 100}{13 \times 8} = 6250$$

$$\text{Amt} = 6250 \left(1 + \frac{8}{100}\right)^2 = 7290$$

$$\text{CI} = \text{Amt} - \text{Principal} = 7290 - 6250 = 1040$$

$$31. (d) \text{ Rate of interest} = \frac{\text{SI} \times 100}{P \times T} = \frac{23940 \times 100}{28500 \times 7} = 12\% \text{ p.a.}$$

$$32. (b) \text{ Amount} = 25,000 \left(1 + \frac{8}{100}\right)^2 = 29160$$

$$33. (d) \text{ Principal} = \frac{\text{SI} \times 100}{R \times T} = \frac{57200 \times 100}{11 \times 8} = 65000$$

$$34. (c) \text{ Amt} = 45000 \left(1 + \frac{9}{100}\right)^2 = 53464.5$$

$$\text{CI} = 53464.5 - 45000 = 8464.5$$

$$35. (b) \text{ Amt} = 10,000 \left(1 + \frac{10}{100}\right) \left(1 + \frac{12}{100}\right) = 12320$$

$$36. (b) \text{ Difference} = P \left(\frac{R}{100}\right)^2 = 7300 \left(\frac{6}{100}\right)^2 = 7300 \times \frac{36}{10000} = 26.28$$

$$37. (c) \text{ Rate} = \frac{(3-1) \times 100}{5} = 40\%$$

$$\text{Time} = \frac{(6-1) \times 100}{40} = 12.5 \text{ years.}$$

$$38. (d) \text{ Rate} = \frac{\left(\frac{7}{3} - 1\right) \times 100}{10} = 13.33\%$$

$$39. (b) \text{ SI} = \frac{P \times y \times 2}{100} = \frac{2yp}{100}$$

$$\text{SI} = \frac{P \times 2y \times (2+x)}{100} = \frac{2y(2+x)}{100}$$

$$5 \times \frac{2yp}{100} = 2yp \frac{(2+x)}{100}$$

$$5 = 2 + x$$

$$5 - 2 = x = 3.$$

40. (c) Let the amount deposited be x.

$$\text{SI for first 2 years} = \frac{x \times 6 \times 2}{100} = \frac{12x}{100}$$

$$\text{SI for next 3 years} = \frac{x \times 8 \times 3}{100} = \frac{24x}{100}$$

$$\text{SI for } (8-5) \text{ i.e. 3 years} = \frac{x \times 10 \times 3}{100} = \frac{30x}{100}$$

$$\text{So, } \frac{12x}{100} + \frac{24x}{100} + \frac{30x}{100} = 6600$$

$$\frac{66x}{100} = 6600$$

$$x = \frac{6600 \times 100}{66} = 10,000$$

41. (a) Let amount borrowed at 8% be x,
Let amount borrowed at 12% will be (20,000 - x)

$$\frac{x \times 8 \times 3}{100} + \frac{(20,000 - x) \times 12 \times 3}{100} = 5760$$

On solving x = 8000 which is the amt. borrowed at 8%.

$$\text{So, amt. borrowed at 12%} = 20,000 - 8000 = 12,000$$

$$42. (a) \text{ SI} = \frac{18000 \times 10 \times 3}{100} = 5400$$

$$\text{Amt} = 18000 \left(1 + \frac{10}{100}\right)^3 = 23958$$

$$\text{CI} = 23958 - 18000 = 5958.$$

$$\text{Profit} = 5958 - 5400 = 558$$

$$43. (c) \text{ Amt} = P \left(1 + \frac{10}{100}\right)^2$$

$$14520 = P \left(\frac{110}{100}\right)^2 \text{ or}$$

$$P = 14520 \times \frac{100}{110} \times \frac{100}{110} = 12,000$$

$$44. (d) \text{ SI} = \frac{25,000 \times 15 \times 5}{100} = 18750$$

$$\text{Amt} = 25000 + 18750 = 43750$$

$$\text{Balance} = 43750 - 15000 = 28750$$

$$\text{SI} = \frac{28750 \times 15 \times 3}{100} = 12937.5$$

$$\text{Amt} = 28750 + 12937.5 = 41687.5$$

$$45. (b) \text{ SI} = \frac{50,000 \times 8 \times 2}{100} = 8000$$

$$\text{Amt} = 50,000 + 8000 = 58,000$$



PROFIT AND LOSS

CHAPTER

6

PROFIT AND LOSS

This chapter helps you to understand the intricacies of business world and the computation of profit or loss arising out of business transactions.

Various concepts related to this topic are :

Cost Price (CP): It is the price at which the item is procured by the seller.

Selling Price (SP) : It is the price at which the item is sold by the seller.

Profit : It is the excess of the selling price over cost price, i.e.

$$\text{Profit} = \text{SP} - \text{CP}$$

Loss: It is the excess of cost price over the selling price, i.e.

$$\text{Loss} = \text{CP} - \text{SP}$$

Profit Percent : It is profit, expressed as a percentage of cost price, i.e.

$$\text{Profit Percent} = \frac{\text{Profit}}{\text{CP}} \times 100$$

Loss Percent: It is loss, expressed as a percentage of cost price,

$$\text{i.e., Loss Percent} = \frac{\text{Loss}}{\text{CP}} \times 100$$

Note: It should be kept in mind, that both profit and loss percent are calculated on cost price.

Formulas to ascertain cost price or selling price when profit or loss percent are given-

To Find SP when Profit or Loss Percent & CP are given-

❖ In case Profit percent & CP is given

$$\text{Then SP} = \left[\frac{100 + \text{Profit}\%}{100} \right] \times \text{CP.}$$

❖ In case loss percent & CP is given,

$$\text{Then SP} = \left[\frac{100 - \text{Loss}\%}{100} \right] \times \text{CP.}$$

ILLUSTRATION 1: A shopkeeper buys scientific calculators in bulk for ₹ 15 each. He sells them for ₹ 40 each.

Calculate the profit on each calculator in rupees, and also the profit percent.

Sol. Given: cost price = ₹ 15,

selling price = ₹ 40

profit = selling price - cost price

$$= ₹ 40 - 15 = ₹ 25$$

$$\text{Profit \%} = \frac{\text{profit}}{\text{cost price}} \times 100$$

$$= \frac{25 \times 100}{15} = 166.7\%$$

ILLUSTRATION 2: If the cost price of a book is ₹ 150 and its selling price is ₹ 137.50, then calculate the loss and percentage loss on the book?

Sol. Here, cost price = ₹ 150

and selling price = ₹ 137.50

$$\therefore \text{Loss} = \text{Cost price} - \text{selling price} \\ = ₹ (150 - 137.50) = ₹ 12.50$$

$$\text{Now, Percentage Loss} = \frac{\text{Loss} \times 100}{\text{Cost Price}}$$

$$= \frac{12.50 \times 100}{150}$$

$$= 8.33\%$$

ILLUSTRATION 3: A chair was purchased for ₹ 470 and sold at a profit of 10%. Find the selling price.

Sol. Using the formula

$$\text{Selling price} = \text{cost price} \left(\frac{100 + \text{profit}\%}{100} \right)$$

$$= 470 \left(\frac{100 + 10}{100} \right)$$

$$= 470 \times \frac{110}{100} = ₹ 517$$

ILLUSTRATION 4: A person bought a table for ₹ 420 and sold it at a loss of 15%. Find the selling price of the table.

$$\text{Sol. Selling price} = \text{cost price} \left(\frac{100 - \text{Loss}\%}{100} \right)$$

$$= ₹ 420 \left(\frac{100 - 15}{100} \right) = \frac{420 \times 85}{100} = ₹ 357$$

❖ When selling price and percentage profit are given, then

$$\text{Cost price} = \text{selling price} \left(\frac{100}{100 + \text{profit}\%} \right)$$

To Find CP when profit or loss percent & SP are given-

- ❖ In case profit percent & SP is given,

$$\text{Then CP} = \left[\frac{100}{100 + \text{Profit}\%} \right] \times \text{SP}$$

- ❖ In case loss percent & SP is given,

$$\text{Then CP} = \left[\frac{100}{100 - \text{Loss}\%} \right] \times \text{SP}$$

ILLUSTRATION 5 : A Chair was sold for ₹ 517 at a profit of 10%. Find the cost price of the chair.

Sol. Here, selling price = ₹ 517
and profit = 10%

$$\begin{aligned} \therefore \text{Cost price} &= \text{selling price} \left(\frac{100}{100 + \text{profit}\%} \right) \\ &= 517 \left(\frac{100}{100 + 10} \right) \\ &= 517 \times \frac{100}{110} = ₹ 470 \end{aligned}$$

ILLUSTRATION 6 : Ram sold a watch for ₹ 376 at a loss of 6%. Find the cost price of the watch.

$$\begin{aligned} \text{Sol. Cost price} &= \text{selling price} \left(\frac{100}{100 - \text{Loss}\%} \right) \\ &= ₹ 376 \times \left(\frac{100}{100 - 6} \right) \\ &= ₹ 376 \times \frac{100}{94} = ₹ 400 \end{aligned}$$

Advanced Conditions:

- ❖ If two items are sold each at rupees R , one at a gain of $x\%$ and other at a loss of $x\%$, there is always an overall loss given by $\frac{x^2}{100}\%$ and the value of loss is given by

$$\frac{2x^2 R}{(100^2 - x^2)}$$

In case the cost price of both the items is the same and percentage loss and gain are equal, then net loss or profit is zero.

ILLUSTRATION 7 : Ram sells two Mobile phones for ₹ 1000 each, one at a profit of 10% and other at a loss of 10%. Find his gain or loss percentage. Also find gain or loss in terms of rupees (₹)

Sol. Using the formula, Loss %

$$= \left(\frac{x^2}{100} \right) \% = \left(\frac{10 \times 10}{100} \right) \% = 1\%$$

$$\text{Loss in terms of rupees} = \frac{2x^2 R}{(100^2 - x^2)}$$

$$\begin{aligned} &= \frac{2 \times 10^2 \times 1000}{100^2 - 10^2} \\ &= \frac{200000}{9900} \\ &= ₹ 20.20 \end{aligned}$$

- ❖ If a dishonest shopkeeper claims to sell goods at cost price, but uses a lighter weight, then his Gain %

$$= \left[\frac{100 \times \text{excess}}{(\text{original value} - \text{excess})} \right]$$

Where excess = amount by which the correct weight is more than the lighter weight.

ILLUSTRATION 8 : A shopkeeper professes to sell sugar at cost price, but uses a false weight which reads 1000 gms for 900 gm. What is his profit percent?

Sol. Using the formula,

$$\begin{aligned} \text{Profit Percent} &= \frac{100 \times \text{excess}}{\text{original value} - \text{excess}} \\ &= \frac{100 \times (1000 - 900)}{1000 - 900} \\ &= \frac{100 \times 100}{900} = 11.11\% \end{aligned}$$

Alternate Method: Shopkeeper net profit = 100 gms.

∴ CP of 1000 gms = SP of 900 gms

$$\begin{aligned} \text{So profit percent} &= \frac{100}{900} \times 100 \\ &= 11.11\% \end{aligned}$$

ILLUSTRATION 9 : A shopkeeper sells rice to a customer, using false weights and gains $\frac{100}{8}\%$ on his cost. What weight has he substituted for a kilogram?

Sol. Using the formula, Gain %

$$\begin{aligned} &= \left[\frac{100 \times \text{excess}}{(\text{original value} - \text{excess})} \right] \\ \Rightarrow \frac{100}{8} &= \left[\frac{100 \times \text{excess}}{(1000 - \text{excess})} \right] \end{aligned}$$

From here, Excess = 111.11 grams

Weight used by shopkeeper = 1000 - 111.11 = 888.89 grams

Alternate Method: To earn a profit of $\left(\frac{100}{8} \right) \%$ i.e

12.5%, the shopkeeper needs to make 1.125 kgs out of 1 kg. So he

will be selling $\frac{1000}{1.125}$ gms = 888.88 gms in place of 1 kg.

To find profit or loss percent, when price of goods is not specified, i.e. only quantity purchased and sold is given—

In these questions cost prices of a given units of goods is compared with the selling price of another units of goods. Following formula is used to ascertain Profit/Loss percent

$$= \frac{\text{Difference in goods}}{\text{goods sold}} \times 100$$

ILLUSTRATION 10 : The CP of 50 articles is equal to the selling price of 40 articles. What is profit or loss percent?

Sol: Since, loss items are sold to recover the cost of more items, therefore it is a case of profit.

$$\begin{aligned} \therefore \text{Profit percent} &= \frac{10}{40} \times 100 \\ &= 25\%. \end{aligned}$$

ILLUSTRATION 11 : The CP of 50 articles is equal to the selling price of 70 articles. What is the profit/loss percent?

Sol: Since more items are sold to recover the cost of less items, then it is a condition of loss.

$$\begin{aligned} \therefore \text{Loss percent} &= \frac{20}{70} \times 100 \\ &= 28.57\% \end{aligned}$$

Ready to Explore some more:

List Price: This price is fixed by the shopkeeper over and above the selling price in anticipation that he would be asked for a discount. It is also known as market-up price.

$$LP \xrightarrow{\% \text{ decrease}} SP \xrightarrow{\% \text{ Profit/Loss}} CP.$$

To find markup percent over cost price when profit and discount

$$\text{percent are given} = \left[\frac{MP}{CP} - 1 \right] \times 100.$$

ILLUSTRATION 12 : After selling an article at a discount of 20%, profit percentage obtained is 10%. What is the mark-up over CP?

Sol: $0.8 MP = 1.1 CP$

$$\frac{MP}{CP} = \frac{1.1}{0.8}$$

$$\text{Mark-up percent} = \left[\frac{MP}{CP} - 1 \right] \times 100$$

$$= \left[\frac{1.1}{0.8} - 1 \right] \times 100$$

$$= \frac{1.1 - 0.8}{0.8} \times 100$$

$$= 37.5\% \text{ above cost price.}$$

Computation of discount percent when buy 'x' get 'y' free scheme is launched:

$$\text{Discount percent} = \frac{\text{Free Units}}{\text{Total Units}} \times 100$$

ILLUSTRATION 13 : Big Bazaar is offering "Buy 2, get 1 free" on household items. What is the net percentage discount being offered by the store?

Sol: According to the formula given above,

$$\begin{aligned} \text{Net Discount Percent} &= \frac{\text{Free Units}}{\text{Total Units}} \times 100 \\ &= \frac{1}{(2+1)} \times 100 \\ &= 33.33\%. \end{aligned}$$

ILLUSTRATION 14 : A Shopkeeper marks up his goods by 20% and gives a discount of 5%. Also, he uses a false balance, which reads 1000 gms for 750 gms. What is his total profit percent?

Sol: Let the CP per gm be 0.10

Accordingly CP of 1 kg i.e. 1000 gms = ₹100.

Selling price of 750 gms

$$= [100 \times 120\% - 5\% \text{ of } 120]$$

$$= 120 - 6 = 114.$$

Cost Price of 750 gms = 75.

$$\text{Profit} = 114 - 75 = 39$$

$$\text{Profit percent} = \frac{39}{75} \times 100 = 52\%$$

When goods are purchased in bulk, and then sold in parts, then to find required profit percent on remaining goods, so as to earn an overall profit percent.

ILLUSTRATION 15 : A dealer in toys, bought some electronic chinese toys for ₹10,000. He sold half of the goods @ 10% profit. At what percent profit should he sell the remaining goods so as to earn an overall profit of 20%?

$$\begin{aligned} \text{Sol: Desired Total Profit} &= 10,000 \times \frac{20}{100} \\ &= 2000. \end{aligned}$$

$$\begin{aligned} \text{Profit on goods sold} &= 5000 \times \frac{10}{100} \\ &= 500 \end{aligned}$$

$$\begin{aligned} \text{Remaining Profit} &= 2000 - 500 \\ &= 1500. \end{aligned}$$

$$\begin{aligned} \text{Profit Percent} &= \frac{1500}{5000} \times 100 \\ &= 30\%. \end{aligned}$$

Alternate Method:

$$\frac{1}{2} \times 10 + \frac{1}{2} \times (x) = 20$$

$$5 + \frac{x}{2} = 20.$$

$$\frac{x}{2} = 15$$

$$x = 15 \times 2 = 30\%.$$

Note : If an article is sold at a gain of say, 20% then S.P = 120% of C.P. So, instead of first finding 20% of CP and then adding, it would be simple to calculate it as given above.

Also, if an article is sold at a loss of say, 20%, then S.P = 80% of CP.

Formulae to Remember**When selling price of an article is greater than the cost price:**

- ❖ Profit = Selling price – cost price
- ❖ Selling price = cost price + profit
- ❖ Cost price = selling price – profit

$$\text{❖ Profit \%} = \frac{\text{profit}}{\text{cost price}} \times 100$$

$$\text{❖ Profit} = \frac{\text{cost price} \times \text{profit \%}}{100}$$

$$\text{❖ Selling Price} = \text{cost price} \times \left(\frac{100 + \text{profit \%}}{100} \right)$$

$$\text{❖ Cost Price} = \left(\frac{100}{100 + \text{profit \%}} \right) \times \text{SP}$$

When selling price of an article is less than the cost price:

- ❖ Loss = cost price – selling price
- ❖ Selling price = cost price – loss
- ❖ Cost price = selling price + loss

$$\text{❖ Loss \%} = \frac{\text{Loss}}{\text{Cost price}} \times 100$$

$$\text{❖ Loss} = \frac{\text{Cost price} \times \text{Loss \%}}{100}$$

$$\text{❖ Selling price} = \text{cost price} \times \frac{(100 - \text{Loss \%})}{100}$$

$$\text{❖ Cost price} = \frac{100 \times \text{selling price}}{100 - \text{Loss \%}}$$

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SOLVED EXAMPLES

EXAMPLE 1: The owner of a cellphone shop charges his customers 32% more than the cost price. If a customer paid ₹ 6600 for the cellphone, then what was the cost price of the cellphone?

- (a) ₹ 5800 (b) ₹ 6100
(c) ₹ 5000 (d) ₹ 5400
(e) None of these

Sol. (c) CP of a cellphone

$$\begin{aligned} & \frac{SP \times 100}{100 + \text{Profit}\%} \\ &= 6600 \times \frac{100}{100 + 32} \\ &= 6600 \times \frac{100}{132} \\ &= 5000 \end{aligned}$$

EXAMPLE 2: Mohan bought a cycle for ₹ 475 and then sold it at a loss of 8% of the cost price. For how much did he sell the cycle?

- (a) ₹ 453 (b) ₹ 419
(c) ₹ 441 (d) ₹ 437
(e) None of these

Sol. (d) SP of the cycle = CP $\left[\frac{100 - \text{loss}\%}{100} \right]$

$$= \left(\frac{92}{100} \times 475 \right) = ₹ 437$$

EXAMPLE 3: A person subscribing to Sky Cable for one year pays ₹ 1,785. If the monthly subscription is ₹ 175, how much discount does a yearly subscriber get?

- (a) 18% (b) 11%
(c) 13% (d) 15%
(e) None of these

Sol. (d) Total annual subscription = ₹ (175 × 12) = ₹ 2100

Actual subscription = ₹ 1785

$$\therefore \text{Discount} = ₹ (2100 - 1785) = ₹ 315$$

$$\therefore \text{Discount percent} = \frac{315}{2100} \times 100 = 15\%$$

Note: It is calculated on total cost.

EXAMPLE 4: The labelled price of a product is ₹ 750. If it is sold at a 20% discount and still the dealer earns a 25% profit, what is the cost price?

- (a) ₹ 550 (b) ₹ 450
(c) ₹ 435 (d) ₹ 480
(e) None of these

Sol. (d) SP of the product = List Price – Discount

$$\text{or, } \frac{(100 - \text{discount}\%)}{100} \times \text{LP}$$

$$\frac{SP \times 100}{100 + \text{Profit}\%}$$

$$= \left(\frac{80}{100} \times 750 \right) = ₹ 600$$

$$\text{Profit} = 25\%$$

$$\therefore \text{CP} = \frac{100}{125} \times 600 = ₹ 480$$

In a single step

$$\text{CP} = \left[\frac{100 - \text{discount}\%}{100} \right] \left[\frac{100}{100 + \text{Profit}\%} \right] \times \text{LP}$$

EXAMPLE 5: In a sale, a pair of trousers is available at 15% discount on the selling price. The trousers' discounted selling price is ₹ 837.25 in the sale. What was the original selling price of the trousers?

- (a) ₹ 995 (b) ₹ 990
(c) ₹ 1,005 (d) ₹ 985
(e) ₹ 1,012

Sol. (d) Required selling price

$$= \left(\frac{100}{85} \times 837.25 \right) ₹ = 985 ₹$$

EXAMPLE 6: A gold bracelet is sold for ₹ 14,500 at a loss of 20%. What is the cost price of the gold bracelet?

- (a) ₹ 18,125 (b) ₹ 17,400
(c) ₹ 15,225 (d) ₹ 16,800
(e) None of these

Sol. (a) Cost price of bracelet = $\frac{\text{selling price} \times 100}{100 - \text{Loss}\%}$

$$\therefore \text{Cost Price of bracelet} = \frac{14500 \times 100}{80} = ₹ 18125$$

EXAMPLE ▶ 7 : The cost of 16 kgs of sugar is ₹ 448. The cost of 18kgs of rice is ₹ 756 and the cost of 14 kgs of wheat is ₹ 546. What is the total cost of 23 kgs of sugar, 26 kgs of rice and 21 kgs of wheat?

- (a) ₹ 2,585 (b) ₹ 2,615
(c) ₹ 2,555 (d) ₹ 2,600
(e) None of these

Sol. (c) ∴ CP of 16 kg of sugar = ₹ 448

$$\therefore \text{CP of 23kg of sugar} = \frac{448}{16} \times 23 = ₹644$$

similarly, CP of 26 kg of rice

$$= \frac{756 \times 26}{18} = ₹1092$$

and CP of 21 kg of wheat

$$= \frac{546}{14} \times 21 = ₹819$$

Required price

$$= ₹(644 + 1092 + 819)$$

$$= ₹2555$$

EXAMPLE ▶ 8 : The profit earned after selling an article for ₹ 996 is the same as loss incurred after selling the article for ₹ 894. What is the cost price of the article ?

- (a) ₹ 935 (b) ₹ 905
(c) ₹ 945 (d) ₹ 975
(e) None of these

Sol. (c) Cost price = $\frac{996 + 894}{2}$
= ₹945

EXAMPLE ▶ 9 : Shri Ramlal purchased a TV set for ₹ 12,500 and spent ₹ 300 on transportation and ₹ 800 on installation. At what price should he sell it so as to earn an overall profit of 15%?

- (a) ₹ 14,560 (b) ₹ 14,375
(c) ₹ 15,460 (d) ₹ 15,375
(e) None of these

Sol. (e) Selling price

$$= (12500 + 300 + 800) \times \frac{115}{100}$$

$$= 13600 \times \frac{115}{100}$$

$$= ₹ 15640$$

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EXERCISE

- Mohan bought a watch with 25% discount on the selling price. If the watch cost him ₹ 1,545, what is the original selling price of the watch?
 - ₹ 2,050
 - ₹ 2,000
 - ₹ 2,040
 - Cannot be determined
 - None of these
- The owner of an electronics shop charges his customer 22% more than the cost price. If a customer paid ₹ 10,980 for a DVD player, then what was the cost price of the DVD player?
 - ₹ 8000
 - ₹ 8800
 - ₹ 9500
 - ₹ 9200
 - None of these
- The owner of a stationery shop charges his customers 28% more than the cost price. If a customer paid ₹ 4544 for school books, then what was the cost price of the school books?
 - ₹ 3550
 - ₹ 3500
 - ₹ 3450
 - ₹ 3400
 - None of these
- When the original price of a toy was increased by 25% the price of one dozen toys was ₹ 300. What was the original price of one toy?
 - ₹ 24
 - ₹ 29
 - ₹ 30
 - ₹ 15
 - ₹ 20
- The owner of an electronics shop charges his customers 25% more than the cost price. If a customer paid ₹ 11,500 for a television set, then what was the cost price of the television set?
 - ₹ 9,200
 - ₹ 7,200
 - ₹ 8,600
 - ₹ 9,800
 - ₹ 10,000
- Vinita bought a watch with 24% discount on the selling price. If the watch cost her ₹ 779, what is the original selling price of the watch?
 - ₹ 1000
 - ₹ 950
 - ₹ 1040
 - Cannot be determined
 - None of these
- The owner of a toy shop charges his customers 33% more than the cost price. If the customer paid ₹ 4,921 for a toy, then what was the cost price of the toy?
 - ₹ 3,850
 - ₹ 3,700
 - ₹ 3,550
 - ₹ 3,900
 - None of these
- Mohan purchased an article and sold it for ₹ 2817.50 and earned 15 percent profit on the cost price. What was the cost price of the article?
 - ₹ 2,500
 - ₹ 2,450
 - ₹ 2,540
 - ₹ 3,315
 - None of these
- The profit earned after selling an article for ₹ 1,754 is the same as loss incurred after selling the article for ₹ 1,492. What is the cost price of the article?
 - ₹ 1,623
 - ₹ 1,523
 - ₹ 1,689
 - ₹ 1,589
 - None of these
- Prathik sold a music system to Karthik at 20% gain and Karthik sold it to Swasthik at 40% gain. If Swasthik paid ₹ 10,500 for the music system, what amount did Prathik pay for the same?
 - ₹ 8,240
 - ₹ 7,500
 - ₹ 6,250
 - Cannot be determined
 - None of these
- In a sale, a perfume is available at a discount of 15% on the selling price. If the perfume's discounted selling price is ₹ 3675.40, what was the original selling price of the perfume?
 - ₹ 4,324
 - ₹ 4,386
 - ₹ 4,400
 - ₹ 4,294
 - None of these
- What profit/loss percent did Ravi earn if he purchased an item of ₹ 5,600 and sold it at three-fourth of its cost price?
 - Loss of 20 percent
 - Gain of 25 percent
 - Neither gain nor loss
 - Loss of 25 percent
 - None of these
- An article was purchased for 78,350/-. Its price was marked up by 30%. It was sold at a discount of 20% on the marked up price. What was the profit percent on the cost price?
 - 10
 - 6
 - 4
 - 2
 - None of the above
- Manhar sold an item for ₹ 8400 and incurred a loss of 25%. At what price should he have sold the item to have gained a profit of 40%?
 - ₹ 15,680
 - ₹ 16,220
 - ₹ 14,540
 - Cannot be determined
 - None of the above

15. Prashant incurred a loss of 75% on selling an article for ₹ 6800. What was the cost price of the article ?
 (a) 27,700 (b) 25,600
 (c) 21,250 (d) 29,000
 (e) None of these
16. A milkman sells 120 litres of milk for ₹3360 and he sells 240 litres of milk for ₹6120. How much discount does the trader give per litre of milk, when he sells 240 litres of milk?
 (a) ₹2 (b) ₹3.5
 (c) ₹2.5 (d) ₹1.5
 (e) None of the above
17. Ghanshyam purchased an article for ₹1850. At what price should he sell it so that 30% profit is earned?
 (a) ₹2450 (b) ₹2245
 (c) ₹2405 (d) ₹2425
 (e) None of the above
18. Vandana sells an article for ₹3240 and earns a profit of 20%. What is the cost price of the article?
 (a) ₹2800 (b) ₹2820
 (c) ₹2750 (d) ₹2700
 (e) None of these
19. A DVD player was purchased for ₹4860. At what price it should be sold so that 25% profit is earned?
 (a) ₹6225 (b) ₹6275
 (c) ₹6075 (d) ₹6025
 (e) None of these
- Directions (20-22) : Study the information given below and answer the questions that follow :**
 An article was bought for ₹5600. Its price was marked up by 12%. Thereafter it was sold at a discount of 5% on the marked price
20. What was the marked price of the article ?
 (a) ₹6207 (b) ₹6242
 (c) ₹6292 (d) ₹6192
 (e) ₹6272
21. What was the percent profit on the transaction?
 (a) 6.8% (b) 6.3%
 (c) 6.4% (d) 6.6%
 (e) 6.2%
22. What was the amount of discount given?
 (a) ₹319.6 (b) ₹303.6
 (c) ₹306.3 (d) ₹313.6
 (e) ₹316.9
23. 21 articles were bought for ₹6531 and sold for ₹ 9954. How much was the approximate profit percentage per article ?
 (a) 56% (b) 43%
 (c) 52% (d) 49%
 (e) 61%
24. The C.P. of an article is ₹1700. If it was sold at a price of ₹2006, what was the percentage profit on the transaction ?
 (a) 18 (b) 12
 (c) 10 (d) 15
 (e) 20
25. Meera purchased 23 bracelets at the rate of ₹160 per bracelet. At what rate per bracelet should she sell the bracelets so that profit earned is 15%?
 (a) ₹184 (b) ₹186
 (c) ₹192 (d) ₹198
 (e) None of these
26. 'A' got 30% concession on the label price of an article sold for ₹8750 with 25% profit on the price he bought. The label price was
 (a) ₹10,000 (b) ₹13,000
 (c) ₹16,000 (d) ₹12,000
 (e) None
27. The C.P. of a book is ₹150. At what price should it be sold to gain 20%?
 (a) ₹80 (b) ₹120
 (c) ₹180 (d) ₹100
 (e) None
28. If books bought at prices ranging from ₹150 to ₹300 are sold at prices ranging from ₹250 to ₹350, what is the greatest possible profit that might be made in selling 15 books?
 (a) ₹3000 (b) Cannot be determined
 (c) ₹750 (d) ₹4250
 (e) None
29. A man sold two articles at ₹375 each. On one, he gains 25% and on the other he loses 25%. The gain or loss % on the whole transaction is :
 (a) 6% (b) $4\frac{1}{6}\%$
 (c) ₹ 50 (d) $6\frac{1}{4}\%$
 (e) None
30. A bought an article, paying 5% less than the original price. A sold it with 20% profit on the price he had paid. What percent of profit did A earn on the original price ?
 (a) 10 (b) 13
 (c) 14 (d) $\frac{17}{2}$
 (e) None
31. The profit percent of a bookseller if he sells book at marked price after enjoying a commission of 25% on marked price will be:
 (a) 30% (b) 25%
 (c) 20% (d) $33\frac{1}{3}\%$
 (e) None
32. The printed price of a book is ₹320. A retailer pay ₹244.80 for it. He gets successive discounts of 10% and an another rate. His second rate is :
 (a) 15% (b) 16%
 (c) 14% (d) 12%
 (e) None
33. A sells an article to B at a gain of 10%. B sells it to C at a gain of 5%. If C pays ₹462 for it, what did it cost to A?
 (a) ₹500 (b) ₹450
 (c) ₹600 (d) ₹400
 (e) None
34. The profit obtained by selling a book for ₹56 is the same as the loss obtained by selling this book for ₹42. What is the cost price of the book ?
 (a) ₹40 (b) ₹49
 (c) ₹50 (d) ₹55
 (e) None

35. By selling a toy for ₹150, a shop owner lost $\frac{1}{16}$ th of what it cost to him. What is the C.P. of the toy ?
(a) ₹160 (b) ₹150
(c) ₹140 (d) ₹120
(e) None
36. Profit as a percentage of the selling price is 25%. Express it as a percentage of cost price.
(a) 25% (b) 20%
(c) $33\frac{1}{3}\%$ (d) 15%
(e) None
37. A man sold a book at a profit of 10%. If he had charged ₹45 more, his profit percentage would have been 25%. Find the C.P. of the book.
(a) ₹300 (b) ₹250
(c) ₹200 (d) ₹150
(e) None
38. A fruit-vendor buys 200 bananas for ₹10. How many bananas a rupee can he sell, so that his profit percentage is 25%?
(a) 10 (b) 14
(c) 16 (d) 20
(e) None
39. A shopkeeper professes to sell his good at C.P. only. But he uses 750 gm weight at the place of 1000 gm weight for a kg. What is his net profit percentage?
(a) 33.33% (b) 25%
(c) 20% (d) 16.67%
(e) None
40. Mohan bought a jute bag @ 30% discount on the list price. He then sold it at a price which is 160% of the list price thereby making a profit of ₹81. What is the list price of the bag?
(a) ₹90 (b) ₹100
(c) ₹180 (d) ₹200
(e) None

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ANSWER KEY

1	(e)	9	(a)	17	(c)	25	(a)	33	(d)
2	(e)	10	(c)	18	(d)	26	(a)	34	(b)
3	(a)	11	(a)	19	(c)	27	(c)	35	(a)
4	(e)	12	(d)	20	(e)	28	(a)	36	(c)
5	(a)	13	(c)	21	(c)	29	(d)	37	(a)
6	(e)	14	(a)	22	(d)	30	(c)	38	(c)
7	(b)	15	(e)	23	(c)	31	(d)	39	(a)
8	(b)	16	(c)	24	(a)	32	(a)	40	(a)

ANSWERS & EXPLANATIONS

1. (e) Let the marked price (SP) = ₹ x

According to the question,

$$75\% \text{ of } x = 1545$$

$$\text{or, } x = \frac{1545 \times 100}{75} = ₹ 2060$$

$$x \times \frac{76}{100} = 779$$

$$\text{or, } x = \frac{779 \times 100}{76} = ₹ 1025$$

2. (e) CP of DVD player = SP $\left[\frac{100}{100 + \text{Profit}\%} \right]$

$$= 10980 \times \frac{100}{122}$$

$$= 9000$$

3. (a) Cost price

$$= \text{SP} \left[\frac{100}{100 + \text{profit}\%} \right]$$

$$= 4544 \times \frac{100}{128}$$

$$= 3550$$

4. (e) Cost price of 12 toy's

$$= \text{SP} \times \frac{100}{100 + \text{Profit}\%}$$

$$= 300 \times \frac{100}{125}$$

$$= 240$$

$$\therefore \text{CP of 1 toy} = \frac{240}{12} = 20.$$

5. (a) CP of television set = $\text{SP} \times \frac{100}{100 + \text{Profit}\%}$

$$= ₹ \left(\frac{11500 \times 100}{125} \right) = ₹ 9200$$

6. (e) Let the original selling price of watch = ₹ x

According to the question,

7. (b) Required cost price = $\frac{\text{SP} \times 100}{100 + \text{Profit}\%}$

$$= \frac{100 \times 4921}{133} = ₹ 3700$$

8. (b) Cost price = $\frac{2817.50 \times 100}{115}$

$$= ₹ 2450$$

9. (a) Cost price

$$= \frac{1754 + 1492}{2} = ₹ 1623$$

10. (c) Required amount

$$= \frac{10500 \times 100 \times 100}{120 \times 140} = ₹ 6250$$

11. (a) Original selling price

$$= \frac{3675.4 \times 100}{85}$$

$$= ₹ 4324$$

12. (d) Loss = $\frac{1}{4}$ of the CP

$$\left(1 - \frac{3}{4} \right)$$

$$= \frac{1}{4} \times 100$$

$$= 25\%$$

13. (c) $MP = 78,350 \times 130\% = 101855$
 $SP = 101855 \times 80\% = 81484$
 $Profit = 81484 - 78350 = 3134$
 $Profit\% = \frac{3134}{78350} \times 100 = 4\%$
14. (a) $C.P. = \frac{SP \times 100}{100 - \text{loss}\%}$
 $= 8400 \times \frac{100}{100 - 25} = 11,200$
 $S.P. = CP \times \frac{100 + P\%}{100}$
 $= 11,200 \times \frac{140}{100} = 15,680$
15. (e) $CP = SP \times \frac{100}{100 - \text{loss}\%}$
 $= 6800 \times \frac{100}{100 - 75} = 27,200$
16. (c) $SP \text{ of } 120 \text{ litres} = 3360$
 $\therefore SP \text{ of } 1 \text{ litre} = \frac{3360}{120} = 28$
 $SP \text{ of } 240 \text{ litres} = 6120$
 $\therefore SP \text{ of } 1 \text{ litre} = \frac{6120}{240} = 25.5$
 $Discount \text{ per litre} = 28 - 25.5 = 2.5$
17. (c) $SP = CP \times \frac{(100 + \text{Profit}\%)}{100}$
 $= 1850 \times \frac{130}{100} = 2405$
18. (d) $CP = SP \times \frac{100}{100 + \text{Profit}\%}$
 $= 3240 \times \frac{100}{120} = 2700$
19. (c) $SP = CP \times \frac{(100 + \text{Profit}\%)}{100}$
 $= 4860 \times \frac{125}{100} = 6075$
20. (e) $M.P. = 5600 \times 112\% = 6272$
21. (c) $SP = 6272 \times 95\% = 5958.4$
 $Profit = 5958.4 - 5600 = 358.4$
 $Profit\% = \frac{358.4}{5600} \times 100 = 6.4\%$
22. (d) $Discount = 6272 - 5958.4 = 313.6$
23. (c) $Profit\% = \frac{9954 - 6531}{6531} \times 100 = 52.41 \text{ or } 52\% \text{ approx}$
 (It is irrelevant whether profit is ascertained on the whole transaction or per unit)
24. (a) $Profit\% = \frac{2006 - 1700}{1700} \times 100 = 18\%$
25. (a) $SP = CP \times \frac{(100 + P\%)}{100}$
 $= 160 \times \frac{115}{100} = 184$
26. (a) $CP = SP \times \frac{100}{100 + P\%}$
 $= 8750 \times \frac{100}{125} = 7000$
 $MP = CP \times \frac{100}{100 - 0\%}$
 $= 7000 \times \frac{100}{100 - 30\%} = 7000 \times \frac{100}{70} = 10,000$
27. (c) $SP = CP \times \frac{(100 + P\%)}{100}$
 $= 150 \times \frac{120}{100} = 180$
28. (a) $\text{Min. C.P.} = ₹ 150$
 $\text{Max. SP} = ₹ 350$
 $Profit = 350 - 150 = 200$
 $Profit \text{ on } 15 \text{ books} = 200 \times 15 = 3000$
29. (d) $Percentage \text{ loss} = \frac{(\text{Percentage})^2}{100}$
 $= \frac{(25)^2}{100} = \frac{625}{100} = 6.25\%$
30. (c) Suppose original price is ₹100
 A pays ₹95 for it
 He sells it for $(95 \times 120\%) = 114$
 $Profit \text{ on original price} = 114 - 100 = 14$
 $Profit\% = \frac{14}{100} \times 100 = 14\%$
31. (d) $Profit\% = \frac{\text{Commission on MP}}{100 - \text{Commission}} \times 100$
 $= \frac{25}{100 - 25} \times 100 = 33\frac{1}{3}\%$
32. (a) $320 \left[1 - \frac{10}{100} \right] \left(1 - \frac{D_2}{100} \right) = 244.80$

$$320 \times \frac{90}{100} \times \left(1 - \frac{D_2}{100}\right) = 244.80$$

$$288 \times \left(1 - \frac{D_2}{100}\right) = 244.80$$

$$288 - \frac{288D_2}{100} = 244.80$$

$$\frac{-288D_2}{100} = 244.80 - 288$$

$$\frac{288D_2}{100} = 43.2$$

$$D_2 = \frac{43.2 \times 100}{288} = 15\%$$

33. (d) CP for B = $SP \times \frac{100}{100 + P\%}$
 $= 462 \times \frac{100}{105} = 440$

$$CP \text{ for A} = SP \times \frac{100}{100 + P\%} = 440 \times \frac{100}{110} = 400$$

34. (b) CP = SP - Profit
 $= 56 - x \quad \dots(1)$
 CP = SP + Loss
 $= 42 + x \quad \dots(2)$
 $56 - x = 42 + x$
 $56 - 42 = x + x$

$$14 = 2x, x = \frac{14}{2} = 7.$$

$$CP = 56 - 7 = 49.$$

35. (a) Let the CP be x

$$\text{Loss} = \frac{1}{16} \times x = \frac{x}{16}$$

$$SP = CP - \text{Loss}$$

$$150 = x - \frac{x}{16}$$

$$150 = \frac{15x}{16} \text{ or } x = \frac{150 \times 16}{15}$$

$$= 160.$$

36. (c) Percentage of cost = $\frac{\text{Profit}\%}{100 - P\%} \times 100$
 $= \frac{25}{100 - 25} \times 100 = 33\frac{1}{3}\%$

37. (a) 15% of x = 45
 $x = \frac{45 \times 100}{15}$
 $= 300$

38. (c) CP of 1 banana = $\frac{10}{200} = 0.05$ paisa

$$SP = CP \times \frac{100 + P\%}{100}$$

$$= 0.05 \times \frac{125}{100} = 0.0625$$

$$\text{In 1 rupee he should sell} = \frac{1}{0.0625} = 16 \text{ bananas}$$

39. (a) Profit% = $\frac{\text{Error}}{1000 - \text{Error}} \times 100$
 $= \frac{250}{1000 - 250} \times 100$

$$= 33\frac{1}{3}\%$$

40. (a) Let the LP be 100
 So, cost price = $100 \times 70\%$
 $= 70$
 $SP = 100 \times 160\% = 160$
 Profit = $160 - 70 = 90$
 When profit is 90, LP = 100

$$\text{When profit is 81 LP} = \frac{100 \times 81}{90} = 90$$

AVERAGE

CHAPTER

7

AVERAGE

Average is a general representation of a series. It is calculated by adding a given number of values and then dividing them the number of items. In statistics, average is referred as Arithmetic mean and is denoted by \bar{X} .

$$\text{Hence, Average} = \frac{\text{sum of elements}}{\text{number of elements}} \text{ or } \frac{\sum X}{N}$$

For example : To find the average of 3, 5 and 7.

Solution

Step 1: Find the sum of the numbers.

$$3 + 5 + 7 = 15$$

Step 2: Count the total numbers 5.

There are 3 numbers.

Step 3: Finding average.

$$\frac{15}{3} = 5$$

METHOD TO SOLVE DIFFERENT QUESTIONS ON AVERAGE

❖ **Sum of elements = average \times no. of elements**

ILLUSTRATION 1 : The average of marks obtained by 4 students in a class is 65. Find the total marks obtained by all the 4 students.

Sol. Here, number of students = 4

$$\text{Average} = 65$$

$$\therefore \text{sum of marks obtained} = 65 \times 4 = 260$$

❖ **Number of elements = $\frac{\text{Sum of elements}}{\text{Average}}$**

ILLUSTRATION 2 : If the sum of elements and average are respectively 65 and 13, then find the number of elements.

$$\text{Sol. Number of elements} = \frac{\text{Sum of elements}}{\text{Average}}$$

$$= \frac{65}{13} = 5$$

❖ **Combined average of two different groups whose individual averages are known:**

Let a group with average a contain m quantities and another group of n quantities whose average is b , then the average of group c containing $a + b$ quantities can be given as

$$= \frac{ma + nb}{m + n}$$

ILLUSTRATION 3 : There are 30 students in a class. The average age of the first 10 students is 12.5 years. The average age of the next 20 students is 13.1 years. Find the average age of the whole class.

Sol. In the above question,

$$M = 12.5, a = 10, h = 13.1, b = 20$$

So, according to the formula,

$$\frac{12.5 \times 10 + 13.1 \times 20}{10 + 20}$$

$$= \frac{125 + 262}{30} = \frac{387}{30} = 12.9 \text{ years}$$

❖ **If in a group one or more new quantities are added or excluded, then new quantity or sum**

$$= [\text{change in no. of quantities} \times \text{original average}] \pm [\text{change in average} \times \text{final no. of quantities}]$$

Take +ve sign if average is increased and take -ve sign if average is reduced.

ILLUSTRATION 4 : The average weight of 24 students in a class is 35 kg. If the weight of the teacher is included, the average weight rises by 400 gms. Find the weight of the teacher.

Sol. According to the formula given above

$$\text{Wt. of the teacher} = (1 \times 35) + (.4 \times 25) = 35 + 10 = 45 \text{ kgs.}$$

❖ **To find correct average, if some item is misread.**

(Wrong avg. \times No. of items) –

$$\text{Correct average} = \frac{\text{Wrong value} + \text{Correct value}}{\text{No. of items}}$$

ILLUSTRATION 5: The mean of 10 items is 40. Later on, it was discovered that one item 42 was misread as 24. Find the correct mean.

$$\text{Sol. Correct mean} = \frac{(10 \times 40) - 24 + 42}{10} = 41.8$$

\therefore Average involving time, speed and distance.

In such questions,

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}} \text{ or } \frac{2}{\frac{1}{x} + \frac{1}{y}}$$

Where x & y are individual speeds.

(But this formula can be used only when distance covered is equal).

ILLUSTRATION 6: Arya goes to Agra from Delhi, at a speed of 50 km/hr. and returns with a speed of 40 km/hr. What is her average speed during the whole journey?

$$\begin{aligned} \text{Sol. Average speed} &= \frac{2}{\frac{1}{50} + \frac{1}{40}} \\ &= \frac{2}{0.02 + 0.025} \\ &= \frac{2}{0.045} = 44.44 \text{ km/hr.} \end{aligned}$$

Formulae to Remember

❖ The average of first n natural numbers = $\frac{n+1}{2}$

❖ The average of the first n consecutive even numbers = $(n+1)$

❖ The average of the first n consecutive odd numbers = n

❖ The average of the first n odd natural numbers

$$= \left(\frac{\text{Last odd number} + 1}{2} \right)$$

❖ The average of the first n even numbers

$$= \left(\frac{\text{Last even number} + 1}{2} \right)$$

❖ The average of the squares of the first n natural numbers can be shown to be $\frac{1}{6} (n+1) (2n+1)$

❖ The average of the squares of the first n even natural numbers

$$= \frac{2(n+1) (2n+1)}{3}$$

❖ The average of the squares of the first n odd natural numbers

$$= \frac{(2n-1) (2n+1)}{3}$$

❖ The average of the cubes of the first n natural numbers

$$= \frac{n(n+1)^2}{4}$$

SOLVED EXAMPLES

EXAMPLE ▶ 1: The average of 5 consecutive odd numbers A, B,

C, D and E is 45. What is the product of B and D ?

- (a) 2107 (b) 2205
 (c) 1935 (d) 2021
 (e) None of these

Sol. (d) Let the first odd number, A be x .

According to the question

$$A + B + C + D + E = 5 \times 45$$

$$\Rightarrow x + x + 2 + x + 4 + x + 6 + x + 8 = 225$$

$$\Rightarrow 5x + 20 = 225$$

$$\Rightarrow 5x = 225 - 20 = 205$$

$$\Rightarrow x = \frac{205}{5} = 41$$

$$\therefore A = 41, B = 43, C = 45, D = 47$$

$$\therefore B \times D = 43 \times 47 = 2021$$

EXAMPLE ▶ 2: Find the average of the following set of scores

566, 455, 231, 678, 989, 342, 715

- (a) 590 (b) 555
 (c) 568 (d) 513
 (e) None of these

Sol. (c) Average score

$$= \frac{566 + 455 + 231 + 678 + 989 + 342 + 715}{7}$$

$$= \frac{3976}{7} = 568$$

EXAMPLE ▶ 3: The average age of five officers in a department is 32 years. If the age of their supervisor is added the average is increased by 1. What is the supervisor's age?

- (a) 32 years (b) 48 years
 (c) 38 years (d) 42 years
 (e) None of these

Sol. (c) Supervisor's age = $32 + 6 = 38$ years

EXAMPLE ▶ 4: The average of 5 consecutive numbers A, B, C, D and E is 48. What is the product of A and E ?

- (a) 2162 (b) 2208
 (c) 2024 (d) 2300
 (e) None of these

Sol. (d) Let the five consecutive numbers be $x, x+1, x+2, x+3$ and $x+4$ respectively.

Then, according to the question,

$$x + x + 1 + x + 2 + x + 3 + x + 4 = 5 \times 48$$

$$\text{or } 5x + 10 = 5 \times 48$$

$$\text{or } 5(x + 2) = 5 \times 48$$

$$\text{or } x + 2 = 48$$

$$\text{or } x = 48 - 2 = 46$$

$$\therefore A = x = 46$$

$$\text{and } E = x + 4 = 46 + 4 = 50$$

$$\therefore A \times E = 46 \times 50 = 2300$$

EXAMPLE ▶ 5: If $47a + 47b = 5452$ then what is the average of a and b ?

- (a) 11 (b) 23.5
 (c) 96 (d) 58
 (e) None of these

Sol. (d) $\therefore 47a + 47b = 5452$

$$\Rightarrow 47(a+b) = 5452$$

$$\Rightarrow \frac{a+b}{2} = \frac{5452}{47 \times 2}$$

$$\therefore \text{Required average} = 58$$

EXAMPLE ▶ 6: The total of the ages of a class of 75 girls is 1050, the average age of 25 of them is 12 years and that of another 25 is 16 years. Find the average age of the remaining girls.

- (a) 12 years (b) 13 years
 (c) 14 years (d) 15 years
 (e) None of these

Sol. (c) Average age of remaining girls

$$= \frac{1050 - (25 \times 12 + 25 \times 16)}{75 - (25 + 25)}$$

$$= \frac{1050 - 700}{25} = 14 \text{ years}$$

EXAMPLE ▶ 7: The average marks of a student in seven subjects is 41. After re-evaluation in one subject the marks were changed to 42 from 14 and in remaining subjects the marks remain unchanged. What is the new average marks?

- (a) 45 (b) 44
 (c) 46 (d) 47
 (e) None of these

Sol. (d) New average marks = $\frac{7 \times 41 - 14 + 42}{7}$

$$= \frac{287 + 28}{7} = \frac{315}{7} = 45$$

EXERCISE

- The average of five numbers is 281. The average of the first two numbers is 280 and the average of the last two numbers is 178.5. What is the third number?
 - 488
 - 336
 - 228
 - 464
 - None of these
- The average age of 3 friends is 32 years. If the age of a fourth friend is added, their average age comes to 31 years. What is the age of the fourth friend?
 - 32 years
 - 28 years
 - 24 years
 - 26 years
 - None of these
- Find the average of the following set of scores.
965, 362, 189, 248, 461, 825, 524, 234
 - 476
 - 504
 - 461
 - 524
 - None of these
- If the value of $21a + 21b = 1134$, what is the average of $a + b$?
 - 29
 - 27
 - 58
 - 54
 - None of these
- Out of three given numbers, the first number is twice the second and thrice the third. If the average of the three numbers is 154, what is the difference between the first and the third number?
 - 126
 - 42
 - 166
 - 52
 - None of these
- Average weight of three boys P, T and R is $54\frac{1}{3}$ kgs while the average weight of three boys, E, F and G is 53 kgs. What is the average weight of P, T, R, E, F and G?
 - 53.8kgs
 - 52.4kgs
 - 53.2kgs
 - Cannot be determined
 - None of these
- Find the average of the following set of scores
221, 231, 441, 359, 665, 525
 - 399
 - 428
 - 407
 - 415
 - None of these
- The average of 5 consecutive even numbers A, B, C, D and E is 52. What is the product of B and E?
 - 2916
 - 2988
 - 3000
 - 2800
 - None of these
- Out of the three given numbers, the first number is twice the second and thrice the third. If the average of the three numbers is 121, what is the difference between the first and the third number?
 - 132
 - 99
 - 77
 - 144
 - None of these
- If the value of $16a + 16b = 672$, what is the average of a and b ?
 - 44
 - 21
 - 24
 - 42
 - None of these
- The average of 5 consecutive odd numbers A, B, C, D and E is 41. What is the product of A and E?
 - 1977
 - 1517
 - 1665
 - 1591
 - None of these
- The average weight of a group of 75 girls was calculated as 47 kgs. It was later discovered that the weight of one of the girls was read as 45 kgs., whereas her actual weight was 25 kgs. What is the actual average weight of the group of 75 girls? (Rounded off to two digits after decimal)
 - 46.73 kgs.
 - 46.64 kgs.
 - 45.96 kgs.
 - Cannot be determined
 - None of these
- Abhishek purchased 140 shirts and 250 trousers @ ₹ 450 and @ ₹ 550 respectively. What should be the overall average selling price of shirts and trousers so that 40% profit is earned? (Rounded off to next integer)
 - ₹ 725
 - ₹ 710
 - ₹ 720
 - ₹ 700
 - None of these
- The sum of five numbers is 290. The average of the first two numbers is 48.5 and the average of last two numbers is 53.5. What is the third number?
 - 72
 - 84
 - 96
 - 108
 - None of these
- The average weight of 45 students in a class was calculated as 36 kgs. It was later found that the weight of two students in the class was wrongly mentioned. The actual weight of one of the boys in the class was 32 kgs. but it was mentioned as 34 kgs and the weight of another boy in the class was 45 kgs. whereas it was mentioned as 40 kgs. What is the actual average weight of the 45 students in the class? (Rounded off to two-digits after decimal)
 - 36.07 kg.
 - 36.16 kgs.
 - 35.84 kgs.
 - Cannot be determined
 - None of these
- The average weight of a group of 53 girls was calculated as 58 kgs. It was later discovered that the weight of one of the girls was read as 65 kgs., whereas her actual weight was 45 kgs. What is the actual average weight of the group of 53 girls? (rounded off to two digits after decimal)
 - 58.62
 - 58.37
 - 57.37
 - 57.62
 - None of these

17. Seema's present age is four times her son's present age and four-seventh of her father's present age. The average of the present ages of all three of them is 32 years. What is the difference between the Seema's son's present age and Seema's father's present age ?
 (a) 44 years (b) 48 years
 (c) 46 years (d) Cannot be determined
 (e) None of these
18. The average of four positive integers is 73.5. The highest integer is 108 and the lowest integer is 29. The difference between the remaining two integers is 15. Which of the following is the smaller of the remaining two integers ?
 (a) 80 (b) 86
 (c) 73 (d) Cannot be determined
 (e) None of these
19. The average monthly income of a family of four earning members was ₹ 15,130. One of the daughters in the family got married and left home, so the average monthly income of the family came down to ₹14,660. What is the monthly income of the married daughter?
 (a) ₹ 15,350
 (b) ₹ 12,000
 (c) ₹ 16,540
 (d) Cannot be determined
 (e) None of these
20. The average of 5 positive integers is 436. The average of the first two numbers is 344 and the average of the last two numbers is 554. What is the third number ?
 (a) 482 (b) 346
 (c) 556 (d) 384
 (e) None of these
21. The average marks in English subject of a class of 24 students is 56. If the marks of three students were misread as 44, 45 and 61 of the actual marks 48, 59 and 67 respectively, then what would be the correct average?
 (a) 56.5 (b) 59
 (c) 57.5 (d) 58
 (e) None of these
22. In an Entrance Examination Ritu scored 56 percent marks, Smita scored 92 percent marks & Rina scored 634 marks. The maximum marks of the examination are 875. What are the average marks scored by all the three girls together?
 (a) 1929 (b) 815
 (c) 990 (d) 643
 (e) None of these
23. The average of 30 numbers is 40 and that of other 40 numbers is 30. The average of all the numbers is
 (a) 34.5 (b) $34\frac{2}{7}$
 (c) 35 (d) 34
 (e) None of these
24. The average weight of 12 crewmen in a boat is increased by $\frac{1}{3}$ kg, when one of the crewmen whose weight is 55 kg is replaced by a new man. What is the weight of the new man?
 (a) 58 (b) 60
 (c) 57 (d) 59
 (e) None of these
25. The average of five numbers is 57.8. The average of the first and the second numbers is 77.5 and the average of the fourth and fifth numbers is 46. What is the third number ?
 (a) 45 (b) 43
 (c) 42 (d) Cannot be determined
 (e) None of these
26. What will be the average of the followings set of scores ? 59, 84, 44, 98, 30, 40, 58
 (a) 62 (b) 66
 (c) 75 (d) 52
 (e) 59
27. Average of five numbers is 61. If the average of first and third number is 69 and the average of second and fourth number is 69, what is the fifth number ?
 (a) 31 (b) 29
 (c) 25 (d) 35
 (e) None of these
28. Average weight of 19 men is 74 kgs, and the average weight of 38 women is 63 kgs. What is the average weight (rounded off to the nearest integer) of all the men and the women together?
 (a) 59 kgs. (b) 65 kgs.
 (c) 69 kgs. (d) 67 kgs.
 (e) 71 kgs.
29. The average weight of 15 girls, was recorded as 54 kg. If the weight of the teacher was added, the average increased by two kg. What was the teacher's weight?
 (a) 75 kg (b) 95 kg
 (c) 78 kg (d) 86 kg
 (e) None of these
30. Find the average of the following set of scores : 152, 635, 121, 423, 632, 744, 365, 253, 302
 (a) 403 (b) 396
 (c) 428 (d) 383
 (e) None of these
31. The average of four consecutive numbers A, B, C and D respectively is 56.5. What is the product of A and C?
 (a) 3363 (b) 3306
 (c) 3192 (d) 3080
 (e) None of these
32. The average of five positive numbers is 308. The average of first two numbers is 482.5 and the average of last two numbers is 258.5. What is the third number ?
 (a) 224 (b) 58
 (c) 121 (d) Cannot be determined
 (e) None of these
33. Average of five consecutive odd numbers is 95. What is the fourth number in descending order?
 (a) 91 (b) 95
 (c) 99 (d) 97
 (e) None of these
34. Find the average of following set of numbers, 76, 48, 84, 66, 70, 64
 (a) 72 (b) 66
 (c) 68 (d) 64
 (e) None of these

35. Find the average of the following set of numbers 132, 148, 164, 128, 120, 136
 (a) 142 (b) 136
 (c) 138 (d) 144
 (e) None of these
36. Find the average of the following set of numbers : 148, 88, 184, 166, 96, 122
 (a) 146 (b) 142
 (c) 136 (d) 132
 (e) None of these
37. The average of five positive numbers is 213. The average of the first two numbers is 233.5 and the average of last two numbers is 271. What is the third number ?
 (a) 64 (b) 56
 (c) 106 (d) Cannot be determined
 (e) None of these
38. On children's day sweets were to be equally distributed amongst 200 children. But on that particular day 40 children remained absent; hence each child got 2 sweets extra. How many sweets were distributed?
 (a) 3000 (b) 1500
 (c) 2000 (d) 1600
 (e) Cannot be determined
39. The average of four consecutive even number is 9. Find the largest number
 (a) 12 (b) 6
 (c) 8 (d) 10
 (e) None of these
40. A batsman in his 12th innings makes a score of 63 runs and there by increases his average scores by 2. What is his average after the 12th innings?
 (a) 13 (b) 41
 (c) 49 (d) 87
 (e) None of these

ANSWER KEY

1	(a)	9	(a)	17	(b)	25	(c)	33	(e)
2	(b)	10	(b)	18	(e)	26	(e)	34	(c)
3	(a)	11	(c)	19	(c)	27	(b)	35	(c)
4	(b)	12	(a)	20	(d)	28	(d)	36	(e)
5	(e)	13	(c)	21	(e)	29	(d)	37	(b)
6	(d)	14	(e)	22	(d)	30	(e)	38	(d)
7	(c)	15	(a)	23	(d)	31	(e)	39	(a)
8	(d)	16	(d)	24	(e)	32	(b)	40	(b)

ANSWERS & EXPLANATIONS

1. (a) According to question
 Third number = $(281 \times 5) - [(2 \times 280) + (2 \times 178.5)]$
 or, $560 + x + 357 = 1405$
 or, $x = 1405 - 917 = 488$
2. (b) Age of the fourth friend = $31 \times 4 - 32 \times 3$
 $= 124 - 96 = 28$ years
 Alternatively $(1 \times 32) - (1 \times 4) = 28$ yrs.
3. (a) Required average

$$= \frac{965 + 362 + 189 + 248 + 461 + 825 + 524 + 234}{8}$$

$$= \frac{3808}{8} = 476$$
4. (b) $21a + 21b = 1134$
 or, $21(a + b) = 1134$
 $a + b = \frac{1134}{21} = 54$
 \therefore Required average = $\frac{a + b}{2} = \frac{54}{2} = 27$
5. (e) Let the first number be = $6x$
 \therefore Second number = $3x$
 and the third number = $2x$
 According to the question,
 $6x + 3x + 2x = 154 \times 3$
 or, $11x = 154 \times 3$
 $\therefore x = \frac{154 \times 3}{11} = 42$
 \therefore Required difference = $6x - 2x = 4x = 4 \times 42 = 168$
6. (e) Total wt. of P, T & R = $54 \frac{1}{3} \times 3 = \frac{163}{3} \times 3 = 163$
 Total wt. of E, F & G = $53 \times 3 = 159$
 Total wt. = $163 + 159 = 322$
 Average wt. = $\frac{322}{6} = 53.67$
7. (c) Average score

$$= \frac{1}{6} [221 + 231 + 441 + 359 + 665 + 525] = \frac{1}{6} [2442] = 407$$

8. (d) Let the five consecutive even numbers be $x, x+2, x+4, x+6$ and $x+8$ respectively.
According to the question,
 $x+x+2+x+4+x+6+x+8=5 \times 52$
or $5x+20=260$
or $5x=260-20$
$$\text{or } x = \frac{240}{5} = 48$$

 $\therefore B = x+2 = 48+2 = 50$ and $E = x+8 = 48+8 = 56$
 $\therefore B \times E = 50 \times 56 = 2800$
9. (a) Let the third number be $= x$
 \therefore First number $= 3x$ and second number $= \frac{3x}{2}$
According to the question,
$$\text{or, } 3x + \frac{3x}{2} + x = 3 \times 121$$

$$\text{or, } \frac{6x+3x+2x}{2} = 3 \times 121$$

$$\text{or, } \frac{11x}{2} = 3 \times 121$$

$$\therefore x = \frac{3 \times 121 \times 2}{11} = 66$$

 \therefore Third number $= 66$
Required difference $= 3x - x = 2x = 2 \times 66 = 132$
10. (b) $16a + 16b = 672$
or, $16(a+b) = 672$
 $\therefore a+b = \frac{672}{16} = 42$
Required average $= \frac{a+b}{2} = \frac{42}{2} = 21$
11. (c) Let the consecutive odd numbers be $x, x+2, x+4, x+6$ and $x+8$
According to the question,
$$\frac{x+x+2+x+4+x+6+x+8}{5} = 41$$

or, $5x+20=41 \times 5=205$
or, $5x=205-20=185$
$$\therefore x = \frac{185}{5} = 37$$

 $\therefore A = 37$ and $E = 37+8 = 45$
Required product $= 37 \times 45 = 1665$
12. (a) Additional weight $= 45 - 25 = 20$ kg.
 \therefore Actual average weight $= 47 - \frac{20}{75}$
 $= 46.73$ kg.
13. (c) Average selling price
$$= \frac{140 \times 450 + 250 \times 550}{140 + 250} \times \frac{140}{100}$$

$$= \frac{200500}{390} \times \frac{140}{100} = ₹ 720 \text{ (approx.)}$$
14. (e) Third number $= 290$
 $-(48.5 \times 2) - (53.5 \times 2)$
 $= 290 - 97 - 107 = 86$
15. (a) Actual average weight
$$= 36 + \frac{(32+45-34-40)}{45}$$

$$= 36 + \frac{3}{45}$$

$$= 36 + 0.07$$

$$= 36.07 \text{ kgs.}$$
16. (d) Increase in weight
 $= 65 - 45$
 $= 20$ kg.
 \therefore Increase in average
$$= \frac{20}{53} = 0.38$$

 \therefore Actual average weight
 $= 58 - 0.38$
 $= 57.62$
17. (b) Let Seema's present age be x years.
Then, Seema's son's present age $= \frac{x}{4}$ years
Seema's father's present age $= \frac{7x}{4}$ years.
Then, $x + \frac{x}{4} + \frac{7x}{4} = 32 \times 3$
$$\Rightarrow 12x = 96 \times 4$$

$$\Rightarrow x = \frac{96 \times 4}{12} = 32$$

 \therefore Required difference $= \frac{7 \times 32}{4} - \frac{32}{4}$
 $= 56 - 8 = 48$ years
18. (e) Sum of four integers $= 73.5 \times 4 = 294$
 \therefore Sum of two middle integers $= 294 - (108 + 29) = 157$
Difference between two integers $= 15$
 \therefore The smaller number $= \frac{157-14}{2} = 71$
19. (c) Monthly income of the married daughter
 $= 15130 \times 4 - 14660 \times 3$
 $= 60520 - 43980 = ₹ 16540$
20. (d) Third number $= (436 \times 5) - (344 \times 2 + 554 \times 2)$
 $= 2180 - 1796$
 $= 384$
21. (e) Avg marks $=$
$$\frac{24 \times 56 - (44 + 45 + 61) + 48 + 59 + 67}{24}$$

$$= \frac{1368}{24} = 57$$

22. (d) Marks scored by Smita = $875 \times 92\%$
 $= 805$
 Marks scored by Ritu = $875 \times 56\%$
 $= 490$

$$\text{Avg. Marks} = \frac{805 + 490 + 634}{3}$$
 $= 643$
23. (d) Avg. of all the numbers = $\frac{30 \times 40 + 40 \times 30}{30 + 40}$
 $= \frac{2400}{70} = 34\frac{2}{7}$
24. (e) Let the initial avg. be x .
 $(12 \times x - 55 + y) = 12x + \frac{1}{3}$
 $12x - 55 + y = 12x + \frac{1}{3}$
 $y = \frac{1}{3} + 55$
 $= 55.33$
25. (c) 3rd number = $(5 \times 57.8) - (2 \times 77.5) - (2 \times 46)$
 $= 42$
26. (e) Avg. = $\frac{59 + 84 + 44 + 98 + 30 + 40 + 58}{7}$
 $= 59$
27. (b) 5th Number = $(5 \times 61) - (2 \times 69) - (2 \times 69)$
 $= 29$
28. (d) Avg. wt. of man & women
 $= \frac{19 \times 74 + 38 \times 63}{19 + 38}$
 $= \frac{3800}{51} = 66.67 \sim 67.$
29. (d) Wt. of teacher
 $= (1 \times 54) + (2 \times 16)$
 $= 54 + 32 = 86$

$$\frac{192 + 635 + 121 + 423 + 632 + 744}{9}$$
30. (e) Avg. = $\frac{1365 + 253 + 302}{9}$
 $= 366\frac{7}{9} = 407.4$
31. (e) $\frac{x + x + 1 + x + 2 + x + 3}{4} = 56.5$
 $4x + 6 = 56.5 \times 4$
 $4x = 226 - 6 = 220$
 $x = \frac{220}{4} = 55$
 $A = 55, L = 57$
 Product = $55 \times 57 = 3135$
32. (b) 3rd number = $(5 \times 308) - (2 \times 482.5) - (2 \times 258.5)$
 $= 58.$
33. (e) $\frac{x + x + 2 + x + 4 + x + 6 + x + 8}{5} = 95$
 $5x + 20 = 95 \times 5 = 475$
 $x = \frac{475 - 20}{5} = 91$
 99, 97, 95, 93, 91
 4th Number = 93.
34. (c) Avg. = $\frac{76 + 48 + 84 + 66 + 70 + 64}{6}$
 $= 68$
35. (c) Avg. = $\frac{132 + 148 + 164 + 128 + 120 + 136}{6}$
 $= 138$
36. (e) Avg. = $\frac{148 + 88 + 184 + 166 + 96 + 122}{6}$
 $= 134$
37. (b) 3rd Number = $(5 \times 213) - (2 \times 233.5) - (2 \times 271)$
 $= 56$
38. (d) $\frac{x}{200} + 2 = \frac{x}{200 - 40} = \frac{x}{160}$
 $2 = \frac{x}{160} - \frac{x}{200}$
 $2 = \frac{20x - 16x}{3200} = \frac{4x}{3200}$
 $\frac{2 \times 3200}{4} = x = 1600.$
39. (a) $\frac{x + x + 2 + x + 4 + x + 6}{4} = 9$
 $4x + 12 = 9 \times 4 = 36$
 $4x = 24$
 $x = \frac{24}{4} = 6$
 Largest number = $x + 6$
 $= 6 + 6 = 12$
40. (b) Avg. after 11 innings = x
 Total score after 12
 innings = $11x + 63$.
 Avg. after 12 innings = $x + 2$
 $\frac{11x + 63}{12} = x + 2$
 $11x + 63 = 12x + 24$
 $63 - 24 = 12x - 11x = x = 39.$
 Avg. after 12th innings
 $= 39 + 2 = 41$

RATIO AND PROPORTION

CHAPTER

8

RATIO AND PROPORTION

Ratio

Ratio gives us a relation between two quantities having similar unit. The ratio of A to B is written as A : B or $\frac{A}{B}$, where A is called the antecedent and B the consequent.

Proportion

Proportion is an expression in which two ratios are equal. For

example $\frac{A}{B} = \frac{C}{D}$, $\Rightarrow A : B :: C : D$

Here, $AD = BC$

Properties of Ratios & Proportion

- ❖ $a : b = m a : m b$, where m is a constant
- ❖ $a : b : c = A : B : C$ is equivalent to $\frac{a}{A} = \frac{b}{B} = \frac{c}{C}$,

This is an important property and used in the ratio of three quantities.

If $a : b = c : d$, i.e

$$\frac{a}{b} = \frac{c}{d}, \text{ then}$$

$$\frac{b}{a} = \frac{d}{c}, \text{ this is the property of Invertendo.}$$

If $a : b = c : d$, i.e

$$\frac{a}{b} = \frac{c}{d}, \text{ then}$$

$$\frac{a}{c} = \frac{b}{d}, \text{ this is the property of Alternendo.}$$

- ❖ If $\frac{a}{b} = \frac{c}{d}$, then $\frac{(a+b)}{b} = \frac{(c+d)}{d}$

This property is called **Componendo**

Also,

- ❖ $\frac{(a-b)}{b} = \frac{(c-d)}{d}$

This property is called **Dividendo**

It also follows that:

- ❖ $\frac{(a+b)}{(a-b)} = \frac{(c+d)}{(c-d)}$

This property is called **Componendo and Dividendo**

- ❖ If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f}$... then

$$\frac{(a+c+e+\dots)}{(b+d+f+\dots)} = \text{each individual ratio i.e. } \frac{a}{b} \text{ or } \frac{c}{d}$$

- ❖ If $A > B$ then $\frac{(A+C)}{(B+C)} < \frac{A}{B}$

Where A, B and C are natural numbers

In a proportion it should be remembered that-

Product of means = Product of extremes, i.e. $b \times c = a \times d$.

ILLUSTRATION ▶ 1 : If $12 : 18 :: x : 24$, then find the value of x .

Sol. $12 : 18 :: x : 24$
 $\Rightarrow 12 \times 24 = 18 \times x$
 $\Rightarrow x = \frac{12 \times 24}{18} = 16$

Types of Proportion

Continued Proportion:

We can say that a , b and c are in continued proportion, if.

$$\frac{a}{b} = \frac{b}{c}$$

$$b^2 = ac \Rightarrow b = \sqrt{ac}$$

Here we can say that a is called first proportion, c is called third proportion and b is called mean proportion.

Also, if two nos. are given, and you are required to find mean proportion, then it should be written as-

$$a : x :: x : b,$$

And if third proportion is to be computed, then it should be written as-

$$a : b :: b : x.$$

ILLUSTRATION ▶ 1 : Two numbers are given as 9 and 4. Find its

- Mean proportion, and
- Third proportion.

Sol. (i) To find Mean Proportion-

$$9 : x :: x : 4,$$

$$\text{i.e. } x^2 = 9 \times 4 = 36, \text{ or}$$

$$x = \sqrt{36} = 6$$

(ii) To find third proportion-

$$9 : 4 :: 4 : x,$$

$$\text{i.e. } 9x = 16$$

$$x = \frac{16}{9}$$

Direct Proportion: If X is directly proportional to Y , that means any increase or decrease in any of two quantities will have proportionate effect on the other quantity. If X increases then Y will also increase and vice-versa.

Inverse Proportion: If X is inversely proportional to Y , that means any increase or decrease in any of two quantities will have inverse proportionate effect on the other quantity. This means if X increases, then Y decreases and if X decreases then Y increases and vice-versa for Y .

Applications of Ratio and Proportion

PARTNERSHIP

To find profit-sharing ratio on the basis of capital contribution.

ILLUSTRATION 2 : Ram, Rohan and Ravi are partners in a firm. Ram contributed ₹10,000 for 6 months, where as Rohan and Ravi, both contributed ₹7500 for the full year. If at the end of the year, profit is ₹2500, then find Ram's share of profit.

Sol. Proportionate capital of Ram, Rohan and Ravi
 $= 10,000 \times 6 : 7500 \times 12 : 7500 \times 12$
 $= 60,000 : 90,000 : 90,000$
 or
 ratio = 2 : 3 : 3

$$\text{Ram's share} = 2500 \times \frac{2}{8} = ₹625$$

MIXTURES AND ALLIGATION

"Mixtures and alligations" is about mixing different qualities of goods in order to get desired levels/percentage/concentration of different objects.

ILLUSTRATION 3 : If 100 ml water is mixed with 1000 ml of milk, what is the ratio of the mixture solution?

Sol. Using basic percentages, total solution = 1100 ml,

$$\frac{\text{Water}}{\text{Total solution}} = \frac{100}{1100} = \frac{1}{11}$$

Water : milk = 1 : 10

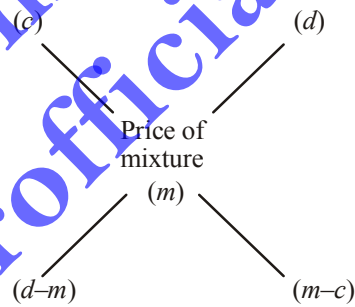
This can also be read as milk solution 10 : 11, where if milk is 10, water is 1 and total solution is 11.

Quicker Method to Solve Questions of Mixture and Alligation.

This rule helps us in solving questions where two varieties (of different prices) are mixed to get a new variety with a new Average price.

$$\frac{\text{Quantity of cheaper variety}}{\text{Quantity of dearer variety}} = \frac{\text{Price of Dearer variety} - \text{Average price}}{\text{Average price} - \text{Price of cheaper variety}}$$

$$\Rightarrow \frac{c}{d} = \frac{d-m}{m-c}$$



Then, (Cheaper quantity) : (dearer quantity)

$$= (d-m) : (m-c) \Rightarrow \frac{c}{d} = \frac{d-m}{m-c}$$

ILLUSTRATION 4 : In what ratio should tea at the rate ₹. 40/kg be mixed with tea at the rate ₹ 27/kg, so that mixture may cost ₹ 30/kg?

Sol. Using the above formula

$$\frac{\text{Quantity of cheaper}}{\text{Quantity of dearer}} = \frac{(40-30)}{(30-27)} = \frac{10}{3}$$

So, the two should be mixed in the ratio $\frac{10}{3}$.

Points to Remember

- ❖ If in a partnership the investments made by first, second and third partners are x_1, x_2, x_3 respectively, the time period be t_1, t_2, t_3 then the ratio of profits is given by $x_1 t_1 : x_2 t_2 : x_3 t_3$.
- ❖ If $x_1 : x_2 : x_3$ is the ratio of investments and $P_1 : P_2 : P_3$ be the ratio of Profit then time periods are given by $\frac{P_1}{x_1} : \frac{P_2}{x_2} : \frac{P_3}{x_3}$
- ❖ If $P_1 : P_2 : P_3$ is the ratio of profit on investments and $t_1 : t_2 : t_3$ be the ratio of time periods, then the ratio of investments will be $\frac{P_1}{t_1} : \frac{P_2}{t_2} : \frac{P_3}{t_3}$

SOLVED EXAMPLES

EXAMPLE 1: There are 1224 students in a school in which 600 are girls. What is the ratio of boys to girls in the school?

- (a) 26 : 25 (b) 21 : 17
 (c) 18 : 13 (d) 5 : 4
 (e) None of these

Sol. (a) Total number of students = 1224

Total number of girls = 600

∴ Total number of boys = 1224 - 600 = 624

∴ Required ratio = 624 : 600 = 26 : 25

EXAMPLE 2: Amar started a business investing ₹ 45,000. Six months later Prakash joined him with ₹ 30,000. In what ratio should the profit, they earn be distributed at the end of the year ?

- (a) 3:1 (b) 3:4
 (c) 3:2 (d) Data inadequate
 (e) None of these

Sol. (a) Rate of the equivalent capitals of Amar and Prakash for 1 month

= 45000 × 12 : 30000 × 6

= 540000 : 180000 = 3 : 1

∴ Ratio of profit sharing = 3 : 1

EXAMPLE 3: Avinash, Manoj and Arun started a business in partnership investing in the ratio of 3:2:5 respectively. At the end of the year they earned a profit of Rs 45,000 which is 15% of their total investment. How much did Manoj invest?

- (a) ₹ 60,000 (b) ₹ 1,80,000
 (c) ₹ 30,000 (d) ₹ 90,000
 (e) None of these

Sol. (a) Total investment = $\frac{100}{15} \times 45000 = ₹ 300000$

∴ Avinash : Manoj : Arun = 3 : 2 : 5

∴ Investment of Manoj = $\left(\frac{2}{10} \times 300000\right) = ₹ 60000$

EXAMPLE 4: The ratio of managers to management trainees is 3:5. When 21 new management trainees are recruited the ratio will become 3:8 How many managers will there be in the group ?

- (a) 27 (b) 24
 (c) 21 (d) Cannot be determined
 (e) None of these

Sol. (c) Let the number of manager and management trainees be 3x and 5x respectively.

According to the question,

$$\frac{3x}{5x+21} = \frac{3}{8}$$

$$\Rightarrow 24x = 15x + 63$$

$$\Rightarrow 9x = 63 \Rightarrow x = \frac{63}{9} = 7$$

$$\therefore \text{Number of managers} = 3x = 3 \times 7 = 21$$

EXAMPLE 5: The ages of Aarzo and Arnav are in the ratio of 11:13 respectively. After 7 years the ratio of their ages will be 20:23. What is the difference in years between their ages?

- (a) 4 years (b) 7 years
 (c) 6 years (d) 5 years
 (e) None of these

Sol. (c) Let the present ages of Aarzo and Arnav be 11x and 13x years respectively.

According to the question,

$$\text{or, } \frac{11x+7}{13x+7} = \frac{20}{23}$$

$$\text{or, } 260x + 140 = 253x + 161$$

$$\text{or, } 260x - 253x = 161 - 140$$

$$\text{or, } 7x = 21$$

$$\therefore x = \frac{21}{7} = 3$$

$$\text{Difference between their ages} = 13x - 11x$$

$$= 2x = 2 \times 3 = 6 \text{ years}$$

EXAMPLE 6: Samir's age is one-fourth of his father's age and two-third of his sister Reema's age. What is the ratio of the ages of Samir, Reema and their father respectively?

- (a) 3 : 2 : 8 (b) 3 : 4 : 8
 (c) 2 : 3 : 8 (d) 4 : 3 : 8
 (e) None of these

Sol. (c) Let Sameer's age be x years

Then his father's age

$$= 4x \text{ years}$$

$$\text{Reema's age} = \frac{3x}{2} \text{ years}$$

$$\therefore \text{Ratio} = x : \frac{3x}{2} : 4x$$

$$= 2 : 3 : 8$$

EXERCISE

- The total number of students in a school is 819. If the number of girls in the school is 364, then what is the respective ratio of the total number of boys to the total number of girls in the school ?
 - 26 : 25
 - 21 : 17
 - 18 : 13
 - 5 : 4
 - None of these
- If a dividend of ₹ 57,834 is to be divided among Meena, Urmila and Vaishali in the proportion of 3:2:1, find Urmila's share.
 - ₹ 19,281
 - ₹ 17,350
 - ₹ 23,133
 - ₹ 19,278
 - None of these
- A sum of money is to be divided among Z, X, Y in the respective proportion of 4:5:6 and another sum to be divided between A and B equally. If Z got ₹ 2000 less than A, how much did X get?
 - ₹ 10,000
 - ₹ 5,000
 - ₹ 4,000
 - Cannot be determined
 - None of these
- The ratio of the present ages of Sushma and Karishma is 6:7 respectively. The ratio of their ages 8 years hence would be 8:9 respectively. What would be the respective ratio of their ages after 12 years ?
 - 17 : 19
 - 15 : 17
 - 9 : 10
 - 10 : 11
 - None of these
- The total number of boys in a school are 16% more than the total number of girls in the school. What is the ratio of the total number of boys to the total number of girls in the school ?
 - 25:21
 - 29:35
 - 25:29
 - Cannot be determined
 - None of these
- A sum of money is to be divided equally amongst P, Q and R in the respective ratio of 5:6:7 and another sum of money is to be divided between S and T equally. If S got ₹ 2,100 less than P, how much amount did Q receive?
 - ₹ 2,500
 - ₹ 2,000
 - ₹ 1,500
 - Cannot be determined
 - None of these
- Ratio of the earning of A and B is 4:7 respectively. If the earnings of A increase by 50% and the earnings of B decrease by 25% the new ratio of their earnings becomes 8:7 respectively. What are A's earnings?
 - ₹ 26,000
 - ₹ 28,000
 - ₹ 21,000
 - Data inadequate
 - None of these
- Pinku, Rinku and Tinku divide an amount of ₹ 4,200 amongst themselves in the ratio of 7:8:6 respectively. If an amount of ₹ 200 is added to each of their shares, what will be the new respective ratio of their shares of amount?
 - 8 : 9 : 6
 - 7 : 9 : 5
 - 7 : 8 : 6
 - 8 : 9 : 7
 - None of these
- Rinku and Pooja started a business initially with ₹ 5,100 and ₹ 6,600 respectively. If the total profit is ₹ 2,730 what is Rinku's share in the profit ?
 - ₹ 1,530
 - ₹ 1,540
 - ₹ 1,200
 - ₹ 1,180
 - None of these
- The ratio of the ages of Richa and Shelly is 5 : 8. The ratio of their ages 10 years hence would be 7:10. What is the present age of Shelly?
 - 45 years
 - 40 years
 - 35 years
 - 30 years
 - 25 years
- The average age of a woman and her daughter is 42 years. The ratio of their ages is 2:1. What is the daughter's age?
 - 28 years
 - 48 years
 - 52 years
 - 32 years
 - None of these
- The total number of boys in a school is 15% more than the total number of girls in the school. What is the ratio of the total number of boys to the total number of girls in the school?
 - 17 : 23
 - 24 : 11
 - 23 : 20
 - 11 : 24
 - None of these
- The ratio of the present ages of Smita and Kavita is 3:8 respectively. Seven years hence the ratio of their ages will be 4:9. What is Kavita's present age?
 - 56 years
 - 63 years
 - 42 years
 - 49 years
 - None of these
- A and B started a business by investing ₹ 35,000 and ₹ 20,000 respectively. B left the business after 5 months and C joined the business with a sum of ₹ 15,000. The profit earned at the end of the year is ₹ 84,125. What is B's share of profit?
 - ₹ 14,133
 - ₹ 15,000
 - ₹ 13,460
 - Cannot be determined
 - None of these

15. The average age of a man and his son is 48 years. The ratio of their ages is 5 : 3 respectively. What is the son's age ?
 (a) 36 years (b) 48 years
 (c) 60 years (d) 24 years
 (e) None of these
16. The ages of Nishi and Vinnee are in the ratio of 6 : 5 respectively. After 9 years the ratio of their ages will be 9 : 8. What is the difference in their ages?
 (a) 9 years (b) 7 years
 (c) 5 years (d) 3 years
 (e) None of these
17. The difference between the present ages of Arun and Deepak is 14 years. Seven years ago the ratio of their ages was 5 : 7 respectively. What is Deepak's present age?
 (a) 49 years (b) 42 years
 (c) 63 years (d) 35 years
 (e) None of these
18. Ninad, Vikas and Manav enter into a partnership. Ninad invests some amount at the beginning. Vikas invests double the amount after 6 months and Manav invests thrice the amount invested by Ninad after 8 months. They earn a profit of ₹45,000 at the end of the year. What is Manav's share in the profit?
 (a) ₹ 25,000 (b) ₹ 15,000
 (c) ₹ 12,000 (d) ₹ 9,000
 (e) None of these
19. Ratio of Rani's and Komal's age is 3 : 5. Ratio of Komal's and Pooja's age is 2 : 3. If Rani is two-fifth Pooja's age, what is Rani's age?
 (a) 10 years (b) 15 years
 (c) 24 years (d) Cannot be determined
 (e) None of these
20. In a mixture of milk and water the proportion of water by weight was 75%. If in the 60 gms of this mixture 15 gm. water was added, what would be the percentage of water?
 (a) 75% (b) 88%
 (c) 90% (d) 100%
 (e) None of these
21. In a college the students in Arts and Commerce faculties were in the ratio of 4 : 5 respectively. When 65 more students joined Commerce faculty the ratio became 8 : 11. How many students are there in Arts faculty?
 (a) 520 (b) 650
 (c) 715 (d) Cannot be determined
 (e) None of these
22. Sarita started a boutique investing an amount of ₹ 50,000. Six months later Neeta joined her with an amount of ₹ 80,000. At the end of one year they earned a profit of ₹ 18,000. What is Sarita's share in the profit?
 (a) ₹ 9,000 (b) ₹ 8,000
 (c) ₹ 12,000 (d) ₹ 10,000
 (e) None of these
23. The ratio between the boys and girls in a class is 6 : 5. If 8 more boys join the class and two girls leave the class then the ratio becomes 11 : 7. What is the number of boys in the class now?
 (a) 28 (b) 38
 (c) 44 (d) 36
 (e) None of these
24. The ratio between the present ages of P and Q is 3 : 4. Four years hence Q will be five years older than P. What is P's present age?
 (a) 15 years
 (b) 20 years
 (c) 25 years
 (d) Cannot be determined
 (e) None of these
25. At present Meena is eight times her daughter's age. Eight years from now, the ratio of the ages of Meena and her daughter will be 10 : 3. What is Meena's present age ?
 (a) 32 years (b) 40 years
 (c) 36 years (d) Cannot be determined
 (e) None of these
26. If $\frac{1}{2}$ of Sunit's salary is equal to $\frac{2}{5}$ of Rajan's salary and their total salary is ₹ 36,000, find Rajan's salary.
 (a) ₹ 16,000 (b) ₹ 20,000
 (c) ₹ 22,000 (d) ₹ 14,000
 (e) None of these
27. Which number should replace both the question marks in the following equation?

$$\frac{?}{84} = \frac{189}{?}$$
 (a) 126 (b) 124
 (c) 130 (d) 132
 (e) 136
28. The ratio of the ages of a father and son is 17 : 7. 6 years ago the ratio of their ages was 3 : 1. What is the father's present age?
 (a) 64 (b) 51
 (c) 48 (d) Cannot be determined
 (e) None of these
29. A sum of money is divided among A, B, C and D in the ratio of 3 : 4 : 9 : 10 respectively. If the share of C is ₹ 2,580/- more than the share of B, then what is the total amount of money of A and D together?
 (a) ₹ 5,676 (b) ₹ 6,192
 (c) ₹ 6,708 (d) ₹ 7,224
 (e) None of these
30. The largest and the second largest angles of a triangle are in the ratio of 13 : 12. The smallest angle is 20% of the sum of the largest and the second largest angles. What is the sum of the smallest and the second largest angles ?

- (a) 120° (b) 108°
 (c) 100° (d) 102°
 (e) None of these
31. Mr. Pandit owned 950 gold coins all of which he distributed amongst his three daughters Lalita, Amita and Neeta. Lalita gave 25 gold coins to her husband, Amita donated 15 gold coins and Neeta made jewellery out of 30 gold coins. The new respective ratio of the coins left with them was 20 : 73 : 83. How many gold coins did Amita receive from Mr. Pandit?
 (a) 380 (b) 415
 (c) 400 (d) 350
 (e) None of these
32. The ratio of the present ages of Swati and Trupti is 4 : 5. Six years hence the ratio of their ages will be 6 : 7. What is the difference between their ages?
 (a) 2 years (b) 3 years
 (c) 4 years (d) Cannot be determined
 (e) None of these
33. The ratio of the ages of A and B seven years ago was 3 : 4 respectively. The ratio of their ages nine years from now will be 7 : 8 respectively. What is B's age at present?
 (a) 16 years (b) 19 years
 (c) 28 years (d) 23 years
 (e) None of these
34. The ratio of ducks and frogs in a pond is 37 : 39 respectively. The average number of ducks and frogs in the pond is 152. What is the number of frogs in the pond?
 (a) 148 (b) 152
 (c) 156 (d) 144
 (e) None of these
35. 75% of a number is equal to three-seventh of another number. What is the ratio between the first number and the second number respectively?
 (a) 4 : 7 (b) 7 : 4
 (c) 12 : 7 (d) 7 : 12
 (e) None of these
36. Srikant and Vividh started a business investing amounts of ₹1,85,000 and ₹2,25,000 respectively. If Vividh's share in the profit earned by them is ₹9,000, what is the total profit earned by them together?
 (a) ₹17,400 (b) ₹16,400
 (c) ₹16,800 (d) ₹17,800
 (e) None of these
37. Populations of two villages X and Y are in the ratio of 5 : 7 respectively. If the population of village Y increases by 25,000 and the population of village X remains unchanged the respective ratio of their populations becomes 25 : 36. What is the population of village X?
 (a) 62,500 (b) 67,500
 (c) 87,500 (d) 90,000
 (e) None of these
38. Four-seventh of a number is equal to 40% of another number. What is the ratio between the first number and second number respectively?
 (a) 5 : 4 (b) 4 : 5
 (c) 10 : 7 (d) 7 : 10
 (e) None of these
39. Beena and Meena started a boutique investing amount of ₹35,000 and ₹56,000 respectively. If Beena's share in the profit earned by them is ₹45,000, what is the total profit earned?
 (a) ₹81,000 (b) ₹127,000
 (c) ₹72,000 (d) ₹117,000
 (e) None of these
40. 52% students from a college participated in a survey. What is the respective ratio between the number of students who did not participate in the survey to the number of students who participated?
 (a) 11 : 13 (b) 12 : 13
 (c) 12 : 17 (d) Cannot be determined
 (e) None of these
41. The ratio of roses and lilies in a garden is 3 : 2 respectively. The average number of roses and lilies is 180. What is the number of lilies in the garden?
 (a) 144 (b) 182
 (c) 216 (d) 360
 (e) None of these
42. The respective ratio between Pooja's, Prarthana's and Falguni's monthly income is 53 : 70 : 57. If Prarthana's annual income is ₹4,20,000, what is the sum of Pooja's and Falguni's annual incomes? (In some cases monthly income and in some cases annual income is used.)
 (a) ₹5,92,500 (b) ₹6,83,500
 (c) ₹6,60,000 (d) ₹7,79,200
 (e) None of these
43. Number of students studying in colleges A and B are in the ratio of 3 : 4 respectively. If 50 more students join college A and there is no change in the number of students in college B, the respective ratio becomes 5 : 6. What is the number of students in college B?
 (a) 450 (b) 500
 (c) 400 (d) 600
 (e) None of these
44. At present Kavita is twice Sarita's age. Eight years hence, the respective ratio between Kavita's and Sarita's ages then will be 22 : 13. What is Kavita's present age?
 (a) 26 years (b) 18 years
 (c) 42 years (d) 36 years
 (e) None of these
45. 80% of a number is equal to three-fifth of another number. What is the ratio between the first and the second number respectively?
 (a) 3 : 4 (b) 4 : 3
 (c) 4 : 5 (d) 5 : 4
 (e) None of these

46. The respective ratio between the present ages of father, mother and daughter is 7 : 6 : 2. The difference between mother's and the daughter's age is 24 years. What is the father's age at present?
 (a) 43 years (b) 42 years
 (c) 39 years (d) 38 years
 (e) None of these
47. 28% members of a certain group are married. What is the respective ratio between the number of married members to the number of unmarried members?
 (a) 7 : 17 (b) 5 : 18
 (c) 7 : 18 (d) Cannot be determined
 (e) None of these
48. The ratio of age of two boys is 5 : 6 after two years the ratio will be 7 : 8. The ratio of their ages after 12 years will be
 (a) 11/12 (b) 22/24
 (c) 15/16 (d) 17/18
 (e) None of these
49. A invests ₹64,000 in a business. After few months B joined him with ₹ 48,000. At the end of year, the total profit was divided between them in the ratio 2 : 1. After how many months did B join?
 (a) 7 (b) 8
 (c) 4 (d) 6
 (e) None of these
50. A and B started a business investing amounts of ₹ 150000 and ₹ 250000 respectively. What will be B's share in the profit of ₹ 160000?
 (a) ₹ 100000 (b) ₹ 60000
 (c) ₹ 80000 (d) ₹ 110000
 (e) None of these
51. Area of rectangular field is 3584 m² and the length and the breadth are in the ratio 7 : 2 respectively. What is the perimeter of the rectangle?
 (a) 246m (b) 292m
 (c) 286m (d) 288m
 (e) None of these
52. Present ages of father and son are in the ratio of 6 : 1 respectively. Four years after the ratio of their ages will become 4 : 1 respectively. What is the son's present age?
 (a) 10 years (b) 6 years
 (c) 4 years (d) 8 years
 (e) None of these

ANSWER KEY

1	(d)	10	(b)	19	(d)	28	(b)	37	(a)	46	(b)
2	(d)	11	(a)	20	(e)	29	(c)	38	(d)	47	(c)
3	(d)	12	(c)	21	(a)	30	(d)	39	(d)	48	(d)
4	(c)	13	(a)	22	(d)	31	(a)	40	(b)	49	(c)
5	(e)	14	(c)	23	(c)	32	(b)	41	(a)	50	(a)
6	(d)	15	(a)	24	(a)	33	(d)	42	(c)	51	(d)
7	(d)	16	(d)	25	(a)	34	(c)	43	(d)	52	(b)
8	(d)	17	(e)	26	(b)	35	(e)	44	(d)		
9	(e)	18	(b)	27	(a)	36	(b)	45	(a)		

ANSWERS & EXPLANATIONS

1. (d) Total number of students in the school = 819
 Number of girls = 364
 \therefore Number of boys = 819 - 364 = 455
 \therefore Required ratio = 455 : 364 = 5 : 4
2. (d) Share of Urmila in dividend
 $= \left(\frac{2}{6} \times 57834 \right) = ₹ 19278$
4. (c) Let the present ages of Sushama and Karishma be 6x and 7x respectively.
 $\therefore \frac{6x+8}{7x+8} = \frac{8}{9}$
 or $56x + 64 = 54x + 72$
 $x = \frac{8}{2} = 4$

$$\text{Required ratio} = \frac{6 \times 4 + 12}{7 \times 4 + 12} = \frac{36}{40} = 9 : 10$$

5. (e) Let the number of girls = x
 \therefore Number of boys = 1.16 x
 \therefore Required ratio = 1.16 x : x
 $= 116 : 100 = 29 : 25$
7. (d) According to the question,

$$\frac{A}{B} = \frac{4}{7} \quad \dots (i)$$

$$\text{and } \frac{A \left(1 + \frac{50}{100} \right)}{B \left(1 - \frac{25}{100} \right)} = \frac{8}{7} \quad \dots (ii)$$

From equations (i) and (ii), we cannot find the earning of A and B.

8. (d) Ratio of the amounts received by A, B and C = 7 : 8 : 6

∴ Sum of the ratios = 7 + 8 + 6 = 21
Sum received by

$$\text{Pinku} = \frac{7}{21} \times 4200 = ₹ 1400$$

$$\text{Rinku} = \frac{8}{21} \times 4200 = ₹ 1600$$

$$\text{Tinku} = \frac{6}{21} \times 4200 = ₹ 1200$$

According to the question,

On adding ₹200 to the share of each one, the required ratio

$$= 1600 : 1800 : 1400 = 8 : 9 : 7$$

9. (e) Ratio of the capital of Rinku and Pooja

$$= \frac{5100}{6600} = \frac{51}{66} = \frac{17}{22}$$

$$\therefore \text{Rinku's share} = \frac{2730 \times 17}{17 + 22} = ₹ 1190$$

10. (b) Let the present ages of Richa and Shelly be 5x and 8x years.

According to the question,

After 10 years,

$$\frac{5x+10}{8x+10} = \frac{7}{10}$$

$$\text{or, } 56x + 70 = 50x + 100$$

$$\text{or, } 56x - 50x = 100 - 70$$

$$\text{or, } 6x = 30$$

$$\therefore x = \frac{30}{6} = 5$$

$$\therefore \text{Shelly's present age} = 8x$$

$$= 8 \times 5 = 40 \text{ years}$$

11. (a) Let the age of woman be 2x years and that of her daughter be x years.

According to the question,

$$2x + x = 2 \times 42$$

$$\text{or, } 3x = 84$$

$$\text{or, } x = \frac{84}{3} = 28$$

$$\therefore \text{Daughter's age} = 28 \text{ years}$$

12. (c) Let the number of girls be = x

$$\therefore \text{Number of the boys} = \frac{115x}{100}$$

$$\therefore \text{Required ratio} = \frac{115x}{100} \cdot x = 23 : 20$$

13. (a) Let the present ages of Smita and Kavita be 3x and 8x years respectively

According to questions,

$$\frac{3x+7}{8x+7} = \frac{4}{9}$$

$$\text{or, } 32x + 28 = 27x + 63$$

$$\text{or, } 32x - 27x = 63 - 28$$

$$\text{or, } 5x = 35$$

$$\text{or, } x = \frac{35}{5} = 7$$

$$\therefore \text{Kavita's present age} = 8x$$

$$= 8 \times 7 = 56 \text{ years}$$

14. (c) Ratio of equivalent capitals of A, B and C for 1 month

$$= 35000 \times 12 : 20000 \times 5 : 15000 \times 7$$

$$= 35 \times 12 : 20 \times 5 : 15 \times 7$$

$$= 84 : 20 : 21$$

$$\text{Sum of the ratios} = 84 + 20 + 21 = 125$$

$$\therefore \text{B's share} = ₹ \left(\frac{20}{125} \times 84125 \right)$$

$$= ₹ 13460$$

15. (a) Let the ages of man and his son be 5x and 3x respectively.

$$\therefore 5x + 3x = 2 \times 48$$

$$\Rightarrow 8x = 96$$

$$\Rightarrow x = \frac{96}{8} = 12$$

$$\therefore \text{Son's age} = 12 \times 3 = 36 \text{ years}$$

16. (d) Difference in age

$$= \frac{9 \times (6-5)(9-8)}{6 \times 8 - 9 \times 5}$$

$$= \frac{9 \times 1 \times 1}{3} = 3 \text{ years}$$

17. (e) Let Arun's present age be x years.

Then, Deepak's present age = (x + 14) years

$$\text{Then, } \frac{x-7}{x+14-7} = \frac{5}{7}$$

$$\Rightarrow 7x - 5x = 35 + 49$$

$$\Rightarrow x = \frac{84}{2} = 42$$

$$\therefore \text{Deepak's present age}$$

$$= 42 + 14 = 56 \text{ years}$$

18. (b) Ratio of profit = 1 × 12 : 2 × 6 : 3 × 4
= 1 : 1 : 1

$$\therefore \text{Manav's share} = 45000 \times \frac{1}{3} = ₹ 15000$$

19. (d) Data is given in ratio. So age can't be determined.

20. (e) In 60 gms mixture proportion of water

$$= 60 \times \frac{75}{100} = 45 \text{ gms}$$

Total proportion of water in new mixture

$$= 45 + 15 = 60 \text{ gms.}$$

$$\therefore \text{Percentage of water} = \frac{60}{60+15} \times 100 = 80\%$$

21. (a) Let number of students in Arts and Commerce were 4x and 5x respectively.

Then,

$$\frac{4x}{5x+65} = \frac{8}{11}$$

- $\Rightarrow 44x - 40x = 520$
 $\Rightarrow x = \frac{520}{4} = 130$
 \therefore Number of students in Arts
 $= 4 \times 130$
 $= 520$
22. (d) Ratio of capital
 $= 50000 \times 12 : 80000 \times 6$
 $= 5 : 4$
 \therefore Sarita's share $= \frac{18000 \times 5}{(5+4)}$
 $= ₹ 10000$
23. (c) Let the original number of boys and girls be $6x$ and $5x$ respectively.
 Then, $\frac{6x+8}{5x-2} = \frac{11}{7}$
 $\Rightarrow 55x - 42x = 56 + 22$
 $\Rightarrow x = \frac{78}{13} = 6$
 \therefore Number of boys
 $= 6 \times 6 + 8 = 44$
24. (a) Let the present ages of P and Q be $3x$ and $4x$ respectively.
 Then,
 $(4x+4) - (3x+4) = 5$
 $\Rightarrow 4x - 3x = 5$
 $\Rightarrow x = 5$
 \therefore P's present age
 $= 3 \times 5 = 15$ yrs.
25. (a) Present age of Meena
 $= \frac{8 \times 8 \times (10-3)}{24-10}$
 $= \frac{8 \times 8 \times 7}{14} = 32$ years
26. (b) Ratio of the salaries of Sumit and Rajan
 $= \frac{2}{5} : \frac{1}{2} = 4 : 5$
 Rajan's salary $= \frac{5}{9} \times 36000 = ₹ 20000$
27. (a) $\frac{?}{84} = \frac{189}{?}$
 or $?^2 = 84 \times 189$
 or $?^2 = 21 \times 4 \times 21 \times 9$
 or $?^2 = 21^2 \times 2^2 \times 3^2$
 $\therefore ? = 21 \times 2 \times 3 = 126$
28. (b) Let the present age of father and son be $17x$ and $7x$ respectively.
 Then, $\frac{17x-6}{7x-6} = \frac{3}{1}$
 $\Rightarrow 21x - 17x = 18 - 6$
 $\Rightarrow x = 12 \div 4 = 3$
 \therefore Father's present age
 $= 17 \times 3 = 51$ years.
29. (c) Required amount
 $= \frac{2580}{(9-4)} \times (3+10) = \frac{2580 \times 13}{5} = ₹ 6708$
30. (d) Smallest angle
 $= (13+12) \times \frac{20}{100} = 5$
 \therefore Ratio of angles = $13 : 12 : 5$
 \therefore Sum of smallest and second largest angles
 $= \frac{180 \times (12+5)}{(13+12+5)} = \frac{180 \times 17}{30} = 102^\circ$
31. (a) Required number of gold coins
 $= \frac{\{950 - (25+15+30)\} \times 73}{(20+73+83)} + 15$
 $= 365 + 15$
 $= 380$
32. (b) Let the present ages be $4x$ and $5x$ respectively.
 Then, $\frac{4x+6}{5x+6} = \frac{6}{7}$
 $\Rightarrow 30x - 28x = 42 - 36$
 $\Rightarrow x = \frac{6}{2} = 3$
 \therefore Difference in age
 $= 5x - 4x$
 $= x = 3$ years
33. (d) Let A's present age = x
 B's present age = y
 $\frac{x-7}{y-7} = \frac{3}{4}$
 $4x - 28 = 3y - 21$
 $4x - 3y = 7$... (i)
 Also, $\frac{x+9}{y+9} = \frac{7}{8}$
 $8x + 72 = 7y + 63$
 $8x - 7y = -9$... (ii)
 On equating (i) & (ii), we get $y = 23$
34. (c) Total number of ducks and frogs = $152 \times 2 = 304$
 No. of frogs = $304 \times \frac{39}{76} = 156$
35. (e) Let the 1st no. be x and 11th no. be y .
 $\frac{75}{100}x = \frac{3}{7}y$
 $.75x = .43y$
 $\frac{x}{y} = \frac{.43}{.75} = \frac{43}{75}$
36. (b) Ratio of capitals of Srikant and Vividh
 $= 185000 : 225000$
 $37 : 45$
 Vividh's share i.e. $\frac{45}{82} \times x = 9000$
 $\therefore x = 9000 \times \frac{82}{45} = 16,400$

37. (a) $x : y = 5 : 7$ or $\frac{x}{y} = \frac{5}{7}$ or $7x = 5y$
or $7x - 5y = 0$... (i)

$$\frac{x}{y + 25000} = \frac{25}{36}$$

$$36x = 25y + 625000$$

$$36x - 25y = 625000 \quad \dots \text{(ii)}$$

On equating (i) and (ii), we get
 $x = 625000$

38. (d) Let the numbers be x and 4

$$\frac{4x}{7} = \frac{40}{100}y$$

$$\frac{x}{y} = \frac{40}{100} \times \frac{7}{4} = 7 : 10$$

39. (d) Ratio of capital
 $= 35000 : 56000$
 $5 : 8$

$$\text{Beena's share} = \frac{5}{13} \times x = 45000$$

$$x = 45000 \times \frac{13}{5} = 117000$$

40. (b) 52% participated, that means 48% did not participate.

$$\text{Ratio} = 48 : 52$$

$$= 12 : 13$$

41. (a) Total no. of Roses & Lilies $= 180 \times 2 = 360$

$$\text{No. of Lilies} = 360 \times \frac{2}{5} = 144$$

42. (c) $70x = 4,20,000$

$$\therefore x = \frac{4,20,000}{70} = 6000$$

$$\text{Pooja's income} = 53 \times 6000 = 318000$$

$$\text{Falguni's income} = 57 \times 6000 = 342000$$

$$\text{Total income} = 318000 + 342000 = 6,60,000$$

43. (d) $\frac{A}{B} = \frac{3}{4}$ or $4A - 3B = 0$... (i)

$$\frac{A+50}{B} = \frac{5}{6}$$

$$6A + 300 = 5B$$

$$6A - 5B = -300 \quad \dots \text{(ii)}$$

On equating (i) & (ii), we get, $B = 600$.

44. (d) Kavita's age = x
Savita's age = y
 $x = 2y$ or $x - 2y = 0$... (i)

$$\frac{x+8}{y+8} = \frac{22}{13}$$

$$13x + 104 = 22y + 176$$

$$13x - 22y = 176 - 104$$

$$13x - 22y = 72 \quad \dots \text{(ii)}$$

On equating (i) & (ii), we get $x = 36$

45. (a) Let the numbers be x and y .

$$\frac{80x}{100} = \frac{3y}{5}$$

$$\frac{x}{y} = \frac{3}{5} \times \frac{100}{80} = 3 : 4$$

46. (b) $6x - 2x = 24$,
i.e. $4x = 24$ or

$$x = \frac{24}{4} = 6$$

$$\text{Father's age} = 7 \times 6 = 42$$

47. (c) 28% are married it implies that 72% are unmarried.

$$\text{Ratio} = 28 : 72$$

$$= 7 : 18$$

48. (d) Let the ages be x & y .

$$\frac{x}{y} = \frac{5}{6} \text{ or}$$

$$6x - 5y = 0 \quad \dots \text{(i)}$$

$$\frac{x+2}{y+2} = \frac{7}{8}$$

$$8x + 16 = 7y + 14$$

$$8x - 7y = -2 \quad \dots \text{(ii)}$$

On equating (i) & (ii), we get

$$x = 5 \text{ \& } y = 6$$

After 12 years

$$x = 17 \text{ \& } y = 18$$

$$\text{Ratio} = 17 : 18$$

49. (c) $\frac{64000 \times 12}{48000 \times x} = \frac{2}{1}$

$$\frac{768000}{48000x} = \frac{2}{1}$$

$$768000 = 2 \times 48000x$$

$$\text{or } \frac{768000}{48000 \times 2} = x = 8$$

$$\text{i.e. B joined after 4 months}$$

50. (a) Ratio of capitals $= 1,50,000 : 2,50,000$
 $3 : 5$

$$\text{B's share} = 1,60,000 \times \frac{5}{8} = 1,00,000.$$

51. (d) Area i.e. $7x \times 2x = 3584$
 $14x^2 = 3584$

$$x^2 = \frac{3584}{14} = 256$$

$$x = \sqrt{256} = 16$$

$$\text{Length} = 7 \times 16 = 112$$

$$\text{Breadth} = 2 \times 16 = 32$$

$$\text{Perimeter} = 2(l \times b) = 2(112 + 32) = 288.$$

52. (b) Ages of father & son $= x$ & y

$$\frac{x}{y} = \frac{6}{1} \text{ \& } x = 6y \text{ or}$$

$$x - 6y = 0 \quad \dots \text{(i)}$$

$$\frac{x+4}{y+4} = \frac{4}{1}$$

$$x + 4 = 4y + 16$$

$$x - 4y = 12 \quad \dots \text{(ii)}$$

On equating (i) & (ii), we get $y = 6$.



TIME AND WORK

CHAPTER

9

TIME AND WORK

In this chapter we will cover the following two topics they are based on similar concepts.

- (i) Time and Work
- (ii) Pipes and Cisterns

❖ **Work is the job assigned or job completed. The rate of work is the speed or speed of work.**

Quicker Method to solve the Questions of Work and Time

If a person completes a job in n days then he will complete

$\frac{1}{n}$ th part in one day.

ILLUSTRATION 1 : Ram will do a piece of work in 15 days; what part of work will he do in two days?

Sol. Here, Man \times Days = Man days

$1 \times 15 = 15$, as given work will take 15 days.

Therefore in **one day**,

$\frac{1}{15}$ th of the work will be done

and in **2 days**

$\frac{1}{15} \times 2 = \frac{2}{15}$ of the work will be done.

❖ **A is twice as good a work man as B, then he will finish the work in half the time**

ILLUSTRATION 2 : Ram is twice as good as Shyam in work; Shyam will do a piece of work in 30 days; in how many days Ram will do the work?

Sol. Since Ram is twice as good,

he will do the work in $\frac{30}{2} = 15$ days

❖ **If A and B can do a piece of work in X and Y days respectively while working alone, they will together take**

$\frac{xy}{(x+y)}$ days to complete it.

ILLUSTRATION 3 : Shyam will do a piece of work in 30 days; Ram can do same work in 15 days; in how many days can both do the work together?

Sol. As per the formula, required days

$$= \frac{30 \times 15}{30 + 15} = \frac{450}{45} = 10 \text{ days}$$

❖ **If A, B, C can do a piece of work in X, Y, Z days respectively**

while working alone, they will together take $\frac{xyz}{[xy + yz + zx]}$

days to finish it

ILLUSTRATION 4 : Shyam will do a piece of work in 30 days; Ram can do same work in 15 days, Bhuvan can do the same work in 10 days; in how many days can all three do the work together?

Sol. As per the formula, required days

$$= \frac{30 \times 15 \times 10}{[30 \times 15 + 15 \times 10 + 30 \times 10]}$$

$$= \frac{4500}{900} = 5 \text{ days}$$

❖ **If A can finish a work in x days and B in y days and A, B and C together in s day then :**

❖ C can finish the work alone in $\frac{sxy}{xy - sy - sx}$

❖ B + C can finish in $\frac{sx}{x - s}$ and

❖ A + C can finish in $\frac{sy}{y - s}$

PIPES AND CISTERNS

Pipes and cisterns problems use the same principles as of time and work. Here a pipe connected with a cistern is called an inlet pipe to fill it or an outlet pipe to empty it.

Quicker Method to solve Questions on Pipes and Cisterns

- ❖ If an inlet pipe can fill a cistern in A hours, the part filled in 1 hour = $\frac{1}{A}$ (*same as work and time fundamentals*)
- ❖ If pipe A is ' x ' times bigger than pipe B , then pipe A will take $\frac{1}{x^{\text{th}}}$ of the time taken by pipe B to fill the cistern.

ILLUSTRATION 5 : It takes 4 hrs for pipe A to empty a 100 liter tank; if another pipe B which is double the size of pipe A is employed, how long will it take to empty the tank?

Sol. Since the Pipe is double the size,

it will take $\frac{1}{2}$ time of the time taken by the smaller pipe

Therefore $\frac{1}{2} \times 4 = 2$ hrs

- ❖ If an inlet pipe can fill a tank in a hours and an outlet pipe empties the full tank in b hours, then the net part filled in 1

hour when both the pipes are opened = $\frac{1}{a} - \frac{1}{b}$

In 1 hour, the part filled (or emptied) = $\frac{1}{a} - \frac{1}{b}$

Time required to fill or empty the tank = $\frac{ab}{b-a}$ hours.

if both are open

- ❖ If x and y fill/empty a cistern in ' m ' and ' n ' hours, then together they will take

$\left(\frac{mn}{m+n}\right)$ hours to fill/empty the cistern

and in one hour $\frac{n+m}{nm}$ th part of the cistern will be

filled/ emptied. (*same as time and work*)

ILLUSTRATION 6 : There are two pipes (inlet and outlet) attached with a tank of 1000 litres. The inlet pipe can fill the tank in 2 hrs. The outlet pipe can empty the tank in 4 hrs. What is the time required to fill the tank in case both are open? In one hour what part of the tank will be filled?

Sol. For Inlet pipe, time to fill the tank = 2 hrs

For Outlet pipe, time to empty the tank = 4 hrs

Time to fill the tank

$$= \frac{2 \times 4}{4-2} = \frac{8}{2} = 4 \text{ hrs}$$

Net part filled/emptied in one hour = $\frac{1}{2} - \frac{1}{4} = \frac{1}{4}$ th part of the tank, which is obvious from the earlier result.

- ❖ If an inlet pipe fills a cistern in ' a ' minutes and takes ' x ' minutes longer to fill the cistern due to a leak in the cistern, then the time in which the leak will empty the cistern is

$$a \left(1 + \frac{a}{x}\right)$$

ILLUSTRATION 7 : There is a pipe attached with a tank of 1000 liters. The inlet pipe can fill the tank in 2 hrs. There is a leak in the tank due to which it takes 2 hrs more to fill the tank. In what time can the leak empty the tank?

Sol. Time taken by pipe to empty the tank = 2 hrs

Extra time taken due to the leak = 2 hrs

By the formula, Time taken for the leak to empty the tank

$$= a \left(1 + \frac{a}{x}\right) = 2 \left(1 + \frac{2}{2}\right)$$

$$= 2 \times 2 = 4 \text{ hours}$$

6. Computer A takes 3 minutes to process an input while computer B takes 5 minutes. If computers A, B and C can process an average of 14 inputs in one hour, how many minutes does Computer C alone take to process one input ?
 (a) 10 (b) 4
 (c) 6 (d) 8
 (e) None of these
7. 21 binders can bind 1400 books in 15 days. How many binders will be required to bind 800 books in 20 days?
 (a) 7 (b) 9
 (c) 12 (d) 14
 (e) None of these
8. George takes 8 hours to copy a 50 page manuscript while Sonia can copy the same manuscript in 6 hours. How many hours would it take them to copy a 100 page manuscript, if they work together ?
 (a) $6\frac{6}{7}$ (b) 9
 (c) $9\frac{5}{7}$ (d) 14
 (e) None of these
9. A can finish a work in 18 days and B can do the same work in half the time taken by A. Then, working together, what part of the same work can they finish in a day?
 (a) $\frac{1}{6}$ (b) $\frac{1}{9}$
 (c) $\frac{2}{5}$ (d) $\frac{2}{7}$
 (e) None of these
10. A and B can finish a work in 10 days while B and C can do it in 18 days. A started the work, worked for 5 days, then B worked for 10 days and the remaining work was finished by C in 15 days. In how many days could C alone have finished the whole work ?
 (a) 30 days (b) 15 days
 (c) 45 days (d) 24 days
 (e) None of these
11. Two pipes A and B can fill a cistern in 10 and 15 minutes respectively. Both fill pipes are opened together, but at the end of 3 minutes, 'B' is turned off. How much time will the cistern take to fill ?
 (a) 6 min (b) 8 min
 (c) 10 min (d) 12 min
 (e) None of these
12. A is 30% more efficient than B. How much time will they, working together, take to complete a job which A alone could have done in 23 days?
 (a) 11 days (b) 13 days
 (c) $20\frac{3}{17}$ days (d) None of these
 (e) None of these
13. A sum of ₹ 25 was paid for a work which A can do in 32 days, B in 20 days, B and C together in 12 days and D in 24 days. How much did C receive if all the four work together?
 (a) ₹ $\frac{14}{3}$ (b) ₹ $\frac{16}{3}$
 (c) ₹ $\frac{15}{3}$ (d) ₹ $\frac{17}{3}$
 (e) None of these
14. Sunil and Pradeep can complete a work in 5 days and 15 days respectively. They both work for one day and then Sunil leaves. In how many days will the remaining work be completed by Pradeep ?
 (a) 11 days (b) 12 days
 (c) 15 days (d) 8 days
 (e) None of these
15. Two pipes A and B can fill a tank in 15 and 12 hours respectively. Pipe B alone is kept open for $\frac{3}{4}$ of the time and both pipes are kept open for the remaining time. In how many hours will the tank will be full ?
 (a) 18 h (b) 20 h
 (c) 10 h (d) 13.5 h
 (e) None of these
16. Suresh can finish a piece of work by himself in 42 days. Mahesh, who is $\frac{1}{5}$ times more efficient as Suresh, requires X days to finish the work if working all by himself. Then what is the value of X ?
 (a) 25 days (b) 30 days
 (c) 35 days (d) 20 days
 (e) None of these
17. If 6 men and 8 boys can do a piece of work in 10 days while 26 men and 48 boys can do the same in 2 days, the time taken by 15 men and 20 boys in doing the same work will be:
 (a) 4 days (b) 5 days
 (c) 6 days (d) 7 days
 (e) None of these
18. 12 men complete a work in 9 days. After they have worked for 6 days, 6 more men join them. How many days will they take to complete the remaining work?

- (a) 2 days (b) 3 days
(c) 4 days (d) 5 days
(e) None of these
19. A and B can do a job in 16 days and 12 days respectively. B has started the work alone 4 days before finishing the job, A joins B. How many days has B worked alone?
(a) 6 days (b) 4 days
(c) 5 days (d) 7 days
(e) None of these
20. A can do 50% more work than as B can do in the same time. B alone can do a piece of work in 20 hours. A, with help of B, can finish the same work in how many hours?
(a) 12 (b) 8
(c) $13\frac{1}{3}$ (d) $5\frac{1}{2}$
(e) None of these
21. Three pipes A, B and C when working alone, can fill a tank from empty to full in 30 minutes, 20 minutes and 10 minutes respectively. When the tank is empty, all the three pipes are opened. A, B and C discharge chemical solutions P, Q and R respectively. What is the proportion of solution R in the liquid in the tank after 3 minutes?
(a) $\frac{5}{11}$ (b) $\frac{6}{11}$
(c) $\frac{7}{11}$ (d) $\frac{8}{11}$
(e) None of these
22. Three taps A, B and C can fill a tank in 12, 15 and 20 hours respectively. If A is open all the time and B and C are open for one hour each alternately, then the tank will be full in :
(a) 6 hrs. (b) $6\frac{2}{3}$ hrs.
(c) 7 hrs. (d) $7\frac{1}{2}$ hrs.
(e) None of these
23. Two pipes A and B when working alone can fill a tank in 36 min. and 45 min. respectively. A waste pipe C can empty the tank in 30 min. First A and B are opened. After 7 min., C is also opened. In how much time will the tank be full?
(a) $\frac{1}{60}$ (b) $\frac{1}{30}$
(c) $\frac{7}{20}$ (d) $\frac{13}{20}$
(e) None of these
24. A contractor undertakes to built a walls in 50 days. He employs 50 peoples for the same. However after 25 days he finds that only 40% of the work is complete. How many more man need to be employed to complete the work in time?
(a) 25 (b) 30
(c) 35 (d) 20
(e) None of these
25. A and B can finish a work in 10 days while B and C can do it in 18 days. A started the work, worked for 5 days, then B worked for 10 days and the remaining work was finished by C in 15 days. In how many days could C alone have finished the whole work ?
(a) 30 days (b) 15 days
(c) 45 days (d) 24 days
(e) None of these
26. A can do a piece of work in 10 days, while B alone can do it in 15 days. They work together for 5 days and the rest of the work is done by C in 2 days. If they get ₹ 450 for the whole work, how should they divide the money ?
(a) ₹ 225, ₹ 150, ₹ 75 (b) ₹ 250, ₹ 100, ₹ 100
(c) ₹ 200, ₹ 150, ₹ 100 (d) ₹ 175, ₹ 175, ₹ 100
(e) None of these
27. A contractor undertook to do a piece of work in 9 days. He employed certain number of laboures but 6 of them were absent from the very first day and the rest could finish the work in only 15 days. Find the number of men originally employed .
(a) 15 (b) 6
(c) 13 (d) 9
(e) None of these
28. A can do a certain job in 12 days. B is 60% more efficient than A. How many days B alone take to do the same job?
(a) $7\frac{1}{2}$ (b) 11
(c) $8\frac{1}{2}$ (d) 8
(e) None of these
29. Pipe A can fill a tank in 5 hours, pipe B in 10 hours and pipe C in 30 hours. If all the pipes are open, in how many hours will the tank be filled ?
(a) 2 (b) 2.5
(c) 3 (d) 3.5
(e) None of these
30. A cistern has three pipes, A, B and C. The pipes A and B can fill it in 4 and 5 hours respectively and C can empty it in 2 hours. If the pipes are opened in order at 1, 2 and 3 a.m. respectively, when will the cistern be empty ?
(a) 3 p.m. (b) 4 p.m.
(c) 5 p.m. (d) 6 p.m.
(e) None of these

ANSWER KEY

1	(e)	7	(b)	13	(b)	19	(c)	25	(c)
2	(c)	8	(a)	14	(a)	20	(b)	26	(a)
3	(c)	9	(a)	15	(c)	21	(b)	27	(a)
4	(e)	10	(c)	16	(c)	22	(c)	28	(a)
5	(a)	11	(b)	17	(a)	23	(a)	29	(c)
6	(c)	12	(b)	18	(a)	24	(a)	30	(c)

ANSWERS & EXPLANATIONS

1. (e) \therefore 15 men can do the work in 3 days.
 \therefore 1 man can do the work in 3×15 days.
 \therefore 10 men can do the same work in
- $$\frac{3 \times 15}{10} = \frac{9}{2} = 4\frac{1}{2} \text{ days}$$
2. (c) \therefore 16 men can complete the work in 8 days.
 \therefore 1 man can complete the work in 8×16
 \therefore 12 men can complete the same work in
- $$\frac{16 \times 8}{12} = \frac{32}{3} = 10\frac{2}{3} \text{ days.}$$
3. (c) Number of days = $\frac{12 \times 8}{12 - 8}$
 $= 24$ days
4. (e) Required number of days
 $= \frac{6 \times 12}{6 + 12}$
 $= 4$ days
5. (a) 112 men can complete the whole work in
 $8 \times 3 = 24$ days
 \therefore Required no. of days
 $= \frac{12 \times 24}{16} = 18$
6. (c) Part processed by computer A in 1 minute = $\frac{1}{3}$
Part processed by computer B in 1 minute = $\frac{1}{5}$
Part processed by computer C in 1 minute
 $= \frac{42}{60} - \frac{1}{3} - \frac{1}{5}$
 $= \frac{42 - 20 - 12}{60} = \frac{10}{60} = \frac{1}{6}$
Hence, computer C will process 1 input in 6 minutes.
7. (b) Required no. of binders = $\frac{800 \times 21 \times 15}{1400 \times 20} = 9$
8. (a) In an hour, George and Sonia together can copy
 $\frac{1}{6} + \frac{1}{8} = \frac{7}{24}$ of a 50-page manuscript.
i.e. In an hour they together can copy $\frac{7}{48}$ of the
100-page manuscript.
i.e. They together can copy a 100-page manuscript in
 $\frac{48}{7}$ hours, i.e. $6\frac{6}{7}$ hours.
9. (a) A's 1 day's work = $\frac{1}{18}$ and B's 1 day's work = $\frac{1}{9}$.
 \therefore (A + B)'s 1 day's work = $\left(\frac{1}{18} + \frac{1}{9}\right) = \frac{1}{6}$.
10. (c) Let C completes the work in x days.
Work done by (A + B) in 1 day = $\frac{1}{10}$
Work done by (B + C) in 1 day = $\frac{1}{18}$
A's 5 days' work + B's 10 days' work
+ C's 15 days' work = 1
or (A + B)'s 5 days' work + (B + C)'s 5 days' work
+ C's 10 days' work = 1
or $\frac{5}{10} + \frac{5}{18} + \frac{10}{x} = 1$
 $\therefore x = 45$ days
11. (b) In one min, (A + B) fill the cistern
 $= \frac{1}{10} + \frac{1}{15} = \frac{1}{6}$ th
In 3 mins, (A + B) fill the cistern
 $= \frac{3}{6} = \frac{1}{2}$ th

$$\text{Remaining part} = 1 - \frac{1}{2} = \frac{1}{2}$$

$\therefore \frac{1}{10}$ th part is filled by A in one min.

$\therefore \frac{1}{2}$ nd part is filled by A in $10 \times \frac{1}{2} = 5$ min.

\therefore Total time = 3 + 5 = 8 min.

12. (b) Ratio of times taken by A and B

$$= 100 : 130 = 10 : 13.$$

Suppose B takes x days to do the work.

Then, 10 : 13 :: 23 : x

$$\Rightarrow x = \left(\frac{23 \times 13}{10} \right) \Rightarrow x = \frac{299}{10}.$$

A's 1 day's work

$$= \frac{1}{23}; \text{ B's 1 day's work} = \frac{10}{299}.$$

$$(A + B)\text{'s 1 day's work} = \left(\frac{1}{23} + \frac{10}{299} \right) = \frac{23}{299} = \frac{1}{13}.$$

\therefore A and B together can complete the job in 13 days.

13. (b) A's one day's work = $\frac{1}{32}$

$$\text{B's one day's work} = \frac{1}{20}$$

$$(B + C)\text{'s one day's work} = \frac{1}{12}$$

$$\therefore \text{C's one day's work} = \frac{1}{12} - \frac{1}{20} = \frac{1}{30}$$

$$\text{D's one day's work} = \frac{1}{24}$$

\therefore (A + B + C + D)'s one day's work

$$= \frac{1}{32} + \frac{1}{20} + \frac{1}{30} + \frac{1}{24} = \frac{15 + 24 + 16 + 20}{480}$$

$$= \frac{5}{32}$$

\therefore Out of $\frac{5}{32}$ of work done,

$\frac{1}{30}$ of the work is done by C.

\Rightarrow Out of Rs. 25 paid for the work, C will receive

$$\text{₹ } \frac{1/30}{5/32} \times 25, \text{ i.e. } \frac{1}{30} \times \frac{32}{5} \times 25 \text{ i.e. ₹ } \frac{16}{3}$$

14. (a) Sunil takes 5 days and Pradeep takes 15 days to do the work.

In a day they would complete $\frac{1}{5} + \frac{1}{15}$ i.e., $\frac{4}{15}$ th work.

The remaining $\frac{11}{15}$ th work would be completed by

Pradeep in $\frac{11}{15} \times 15$ i.e. 11 days.

15. (c) Let the required time to fill the tank be x hours
According to question

$$\frac{1}{12} \left(\frac{3}{4}x \right) + \frac{1}{15} \left(x - \frac{3}{4}x \right) + \frac{1}{12} \left(x - \frac{3}{4}x \right) = 1$$

$$\Rightarrow \frac{x}{16} + \frac{x}{60} + \frac{x}{48} = 1$$

$\therefore x = 10$ hours.

16. (c) Suresh, working alone for 42 days = 1 unit of work.
Mahesh is $1/5$ times more efficient than Suresh. So Mahesh is $6/5$ times as efficient as Suresh. Hence Mahesh should require $5/6$ th of the time taken by Suresh.

Therefore time taken by Mahesh

$$= \frac{5}{6} \times 42 = 35 \text{ days.}$$

17. (a) Let 1 man's 1 day's work = x and
1 boy's 1 day's work = y.

$$\text{Then, } 6x + 8y = \frac{1}{10} \text{ and } 26x + 48y = \frac{1}{2}.$$

Solving these two equations, we get :

$$x = \frac{1}{100} \text{ and } y = \frac{1}{200}.$$

\therefore (15 men + 20 boys)'s 1 day's work

$$= \left(\frac{15}{100} + \frac{20}{200} \right) = \frac{1}{4}.$$

\therefore 15 men and 20 boys can do the work in 4 days.

18. (a) 1 man's 1 day's work = $\frac{1}{108}$.

$$12 \text{ men's } 6 \text{ day's work} = \left(\frac{1}{9} \times 6 \right) = \frac{2}{3}.$$

$$\text{Remaining work} = \left(1 - \frac{2}{3} \right) = \frac{1}{3}.$$

$$18 \text{ men's } 1 \text{ day's work} = \left(\frac{1}{108} \times 18 \right) = \frac{1}{6}.$$

$\frac{1}{6}$ work is done by them in 1 day.

$\therefore \frac{1}{3}$ work is done by them in $6 \times \frac{1}{3} = 2$ days

19. (c) A's one day's work = $\frac{1}{16}$ th work

$$\text{B's one day's work} = \frac{1}{12} \text{ th work}$$

Let the number of days B has worked alone = x days.

Then,

A's amount of work + B's amount of work = 1

$$\Rightarrow 4\left(\frac{1}{16}\right) + (x+4)\left(\frac{1}{12}\right) = 1$$

$$\Rightarrow \frac{1}{4} + \frac{x+4}{12} = 1 \Rightarrow x = \frac{3}{4} \times 12 - 4$$

$$\Rightarrow x = 5 \text{ days}$$

20. (b) B alone can do a work in 20 hours.

∴ A alone can do $\frac{3}{2}$ of the work in 20 hours.

i.e., A alone can do the same work in $\frac{40}{3}$ hours

∴ (A + B)'s one hour's work

$$= \frac{3}{40} + \frac{1}{20} = \frac{5}{40} = \frac{1}{8}$$

⇒ A and B together can finish the whole work in 8 hours.

21. (b) Part filled by (A + B + C) in 3 minutes

$$= 3\left(\frac{1}{30} + \frac{1}{20} + \frac{1}{10}\right) = \left(3 \times \frac{11}{60}\right) = \frac{11}{20}$$

$$\text{Part filled by C in 3 minutes} = \frac{3}{10}$$

$$\therefore \text{Required ratio} = \left(\frac{3}{10} \times \frac{20}{11}\right) = \frac{6}{11}$$

22. (c) (A + B)'s 1 hour's work = $\left(\frac{1}{12} + \frac{1}{15}\right) = \frac{9}{60} = \frac{3}{20}$

$$(A + C)'s 1 hour's work = \left(\frac{1}{12} + \frac{1}{20}\right) = \frac{8}{60} = \frac{2}{15}$$

$$\text{Part filled in 2 hrs} = \left(\frac{3}{20} + \frac{2}{15}\right) = \frac{17}{60}$$

$$\text{Part filled in 6 hrs} = \left(3 \times \frac{17}{60}\right) = \frac{17}{20}$$

$$\text{Remaining part} = \left(1 - \frac{17}{20}\right) = \frac{3}{20}$$

Now, it is the turn of A and B and $\frac{3}{20}$ part is filled by

A and B in 1 hour.

∴ Total time taken to fill the tank = (6 + 1) hrs = 7 hrs.

23. (a) Part filled in 7 min. = $7 \times \left(\frac{1}{36} + \frac{1}{45}\right) = \frac{7}{20}$

$$\text{Remaining part} = \left(1 - \frac{7}{20}\right) = \frac{13}{20}$$

Part filled by (A + B + C) in 1 min.

$$= \left(\frac{1}{36} + \frac{1}{45} - \frac{1}{30}\right) = \frac{1}{60}$$

24. (a) 50 men complete 0.4 work in 25 days.

Applying the work rule, $m_1 \times d_1 \times w_2 = m_2 \times d_2 \times w_1$ we have,

$$50 \times 25 \times 0.6 = m_2 \times 25 \times 0.4$$

$$\text{or } m_2 = \frac{50 \times 25 \times 0.6}{25 \times 0.4} = 75 \text{ men}$$

Number of additional men required = (75 - 50) = 25

25. (c) Let C completes the work in x days.

$$\text{Work done by (A + B) in 1 day} = \frac{1}{10}$$

$$\text{Work done by (B + C) in 1 day} = \frac{1}{18}$$

A's 5 days' work + B's 10 days' work + C's 15 days' work = 1

or (A + B)'s 5 days' work + (B + C)'s 5 days' work + C's 10 days' work = 1

$$\text{or } \frac{5}{10} + \frac{5}{18} + \frac{10}{x} = 1 \text{ or } x = 45 \text{ days}$$

26. (a) Work done by A and B in 5 days = $\left(\frac{1}{10} + \frac{1}{15}\right) \times 5 = \frac{5}{6}$

$$\text{Work remaining} = 1 - \frac{5}{6} = \frac{1}{6}$$

∴ C alone can do the work in $6 \times 2 = 12$ days

$$\text{Ratio of their share work} = \frac{5}{10} : \frac{5}{15} : \frac{2}{12} = 3 : 2 : 1$$

Share of wages = ₹ 225, ₹ 150, ₹ 75.

27. (a) Let the number of men originally employed be x.

$$9x = 15(x - 6)$$

$$\text{or } x = 15$$

28. (a) Ratio of time taken by A and B = 160 : 100 = 8 : 5

Suppose, B alone takes x days to do the job

then, 8 : 5 :: 12 : x

$$8x = 5 \times 12$$

$$x = \frac{5 \times 12}{8} = 7\frac{1}{2} \text{ days.}$$

29. (c) Part filled by (A + B + C) in 1 hour = $\left(\frac{1}{5} + \frac{1}{10} + \frac{1}{30}\right) = \frac{1}{3}$.

∴ All the three pipes together will fill the tank in 3 hours.

30. (c) **Hint :** Let the time be t hours after 1 a.m.

$$\therefore \frac{t}{4} + \frac{(t-1)}{5} - \frac{(t-2)}{2} = 1$$



TIME, SPEED & DISTANCE

CHAPTER 10

This chapter, deals with the following two types of questions :

- (i) Time, Speed and Distance
- (ii) Boat and Stream

TIME, SPEED AND DISTANCE

Speed:

The distance covered per unit time is called speed. Speed is directly proportional to distance and inversely to time

- Distance = speed \times time

- Speed = $\frac{\text{distance}}{\text{time}}$

- Time = $\frac{\text{distance}}{\text{speed}}$

Main Units

- Time : Seconds, minutes, hours
- Distance : meter, kilometer
- Speed : km/hr, m/sec

Conversion

- ❖ 1 km / hr = $\frac{5}{18}$ metre / second

- ❖ 1 metre / second = $\frac{18}{5}$ km / hr

- ❖ 1 Km/hr = $\frac{5}{8}$ mile / hr

- ❖ 1 mile / hr = $\frac{22}{15}$ foot / second

ILLUSTRATION 1: A scooter travels at the speed of 45 kmph.

What is the distance covered by the scooter in 4 minutes ?

Sol. Speed of scooter = 45 km / hr

$$= \frac{45 \times 1000}{60} = 750 \text{ metre / minute}$$

$$\therefore \text{Distance covered in 4 minutes} \\ = 4 \times 750 = 3000 \text{ metre} = 3 \text{ km}$$

Quicker Method to solve the questions on Time, Speed and Distance

- ❖ **Average speed:** The average speed is given by total distance divided by total time taken.

- Average Speed = $\frac{\text{Total Distance}}{\text{Total Time}}$
 $= \frac{(d_1 + d_2 + d_3 + \dots + d_n)}{(t_1 + t_2 + \dots + t_n)}$

- ❖ The average speed in case of a journey from X to Y at speed of A m/sec and returning back to X at a speed of B m/sec, is

$$\left[\frac{2AB}{(A+B)} \right] \text{ metre / second}$$

ILLUSTRATION 2: Sunil travels from Delhi to Patna at the speed of 40 km/hr and returns at the speed of 50 km/hr. What is the average speed of the journey?

Sol. Using the formula,

$$\left[\frac{2AB}{(A+B)} \right] = \frac{2 \times 40 \times 50}{40 + 50}$$

$$= \frac{4000}{90} = 44.44 \text{ Km/hr}$$

- ❖ **Relative speed**

If two trains are moving in opposite directions with a speed of X km/hr and Y km/hr respectively, then (X + Y) is their relative speed. In the other case if two trains are moving in the same direction with a speed of X km/hr and Y km/hr respectively, then (X - Y) is their relative speed.

For the first case the time taken by the trains in passing each other

$$= \frac{L_1 + L_2}{(X + Y)} \text{ hours,}$$

where L_1 and L_2 are lengths of the trains.

For the second case the time taken by the trains in passing each other

$$= \frac{L_1 + L_2}{(X - Y)} \text{ hours,}$$

where L_1 and L_2 are lengths of the trains.

ILLUSTRATION 3 : Two trains, 100 m and 80 m in length are running in the same direction. The first runs at the rate of 51 m/s and the second at the rate of 42 m/s. How long will they take to cross each other?

Sol. Here Length of first train = 100m,
 Length of second train = 80m
 And Speed of first train = 51 m/s
 Speed of second train = 42 m/s
 Relative speed = $51 - 42 = 9$ m/s
 (since trains are running in the same direction)

$$\begin{aligned} \text{As per the formula} &= \frac{L_1 + L_2}{x - y} \\ &= \frac{100 + 80}{9} = 20 \text{ seconds} \end{aligned}$$

ILLUSTRATION 4 : Two trains, 100 m and 80 m in length are running in opposite directions. The first runs at the rate of 10 m/s and the second at the rate of 15 m/s. How long will they take to cross each other?

Sol. Here Length of first train = 100 m
 Length of second train = 80 m
 And Speed of first train = 10 m/s
 Speed of second train = 15 m/s
 Relative speed = $10 + 15 = 25$ m/s
 (since trains are running in opposite directions)

$$\begin{aligned} \text{As per the formula} &= \frac{L_1 + L_2}{x + y} \\ &= \frac{100 + 80}{25} = 7.2 \text{ seconds} \end{aligned}$$

❖ The time taken by a train X meters long to pass a signal post is the time taken for the train to cover X meters.

ILLUSTRATION 5 : A train 300 meters long has a speed of 10 m/s. How long will it take to pass an electric pole?

Sol. Time = $\frac{\text{Distance}}{\text{Speed}}$
 the distance here will be same as the length of the train.
 That is 300 meters.

$$\therefore \text{Time} = \frac{300}{10} = 30 \text{ seconds}$$

❖ The time taken by a x meters long train in passing any object which is y meters long is the time taken for the train to cover the distance x + y.

ILLUSTRATION 6 : A train 300 meters long has a speed of 10 m/s. How long will it take to pass a platform of 50 meters?

Sol. Time = $\frac{\text{Distance}}{\text{Speed}}$

The distance here will be same as the length of the train + the length of the platform.
 This is $300 + 50 = 350$ m

$$\text{Therefore, Time} = \frac{350}{10} = 35 \text{ seconds}$$

BOAT AND STREAM

When we move upstream, our speed gets deducted from the speed of the stream. Similarly when we move downstream our speed gets added to the speed of the stream.

Let the speed of a boat in still water be A km/hr and the speed of the stream (or current) be B km/hr, then

- Speed of boat with the stream i.e. speed downstream = $(A + B)$ km/hr
- Speed of boat against the stream i.e. speed upstream = $(A - B)$ km/hr

❖ **Boat's speed in still water**

$$= \frac{\text{speed downstream} + \text{speed upstream}}{2}$$

❖ **Speed of current**

$$= \frac{\text{Speed downstream} - \text{Speed upstream}}{2}$$

Quicker Method to solve the questions on Boat and Stream

ILLUSTRATION 7 : A boat travels equal distances upstream and downstream. The upstream speed of boat was 10 km/hr, whereas the downstream speed is 20 km/hr. What is the speed of the boat in still water?

Sol. Upstream speed = 10 km/hr
 Downstream speed = 20 km/hr
 As per formula, Boat's speed in still water = $\frac{\text{speed downstream} + \text{speed upstream}}{2}$

$$\begin{aligned} \text{Therefore, Boat's speed in still water} &= \frac{10 + 20}{2} = 15 \text{ km/hr} \end{aligned}$$

ILLUSTRATION 8 : A boat travels equal distance upstream and downstream. The upstream speed of boat is 10 km/hr, whereas the downstream speed is 20 km/hr. What is the speed of the current?

Sol. Upstream speed = 10 km/hr
 Downstream speed = 20 km/hr
 As per formula, Speed of current = $\frac{\text{Speed downstream} - \text{Speed upstream}}{2}$

$$\begin{aligned} \text{Therefore, Speed of current} &= \frac{20 - 10}{2} = \frac{10}{2} = 5 \text{ km/hr} \end{aligned}$$

SOLVED EXAMPLES

EXAMPLE ► 1: A 175 meters long train crosses a 35 meters platform in 12 seconds. What is the speed of the train in km/hr ?

- (a) 42 (b) 64
(c) 63 (d) 59
(e) None of these

Sol. (c) Speed of train

$$= \frac{\text{Distance (length of train + length of platform)}}{\text{Time taken}}$$

$$= \frac{175 + 35}{12} = \frac{210}{12} = \text{m/s}$$

$$= \frac{210}{12} \times \frac{18}{5} \text{ kmph} = 63 \text{ kmph.}$$

EXAMPLE ► 2: A train running at speed of 90 km per hour crosses a platform double its length in 36 seconds. What is the length of the platform in meters ?

- (a) 450 (b) 200
(c) 600 (d) Cannot be determined
(e) None of these

Sol. (c) Let the length of the train be = x metres

∴ Length of the platform = 2x metres

Speed of train = 90 kmph, or

$$= 90 \times \frac{5}{18} = 25 \text{ m/sec.}$$

According to the question,

$$\frac{x + 2x}{25} = 36$$

$$\text{or, } 3x = 25 \times 36$$

$$\text{or, } x = \frac{25 \times 36}{3} = 300 \text{ m}$$

∴ length of platform = 2x = 600 m

EXAMPLE ► 3: A car travels a distance of 75 km at the speed of 25 km/hr. It covers the next 25 km of its journey at the speed of 5 km/hr and the last 50 km of its journey at the speed of 25 km/hr. What is the average speed of the car?

- (a) 40 km/hr (b) 25 km/hr
(c) 15 km/hr (d) 12.5 km/hr
(e) None of these

Sol. (c) Time taken to cover first 75 km of distance

$$= \frac{75}{25} = 3 \text{ hours}$$

Time taken to cover next 25 km of distance

$$= \frac{25}{5} = 5 \text{ hours}$$

Time taken to cover last 50 km of its journey

$$= \frac{50}{25} = 2 \text{ hours}$$

Total distance = 75 + 25 + 50 = 150 km

Total time taken = 3 + 5 + 2 = 10 hours

$$\therefore \text{Average speed} = \frac{150}{10} = 15 \text{ kmph.}$$

EXAMPLE ► 4: Raman drove from home to another town at the speed of 50 km/hr and on his return journey, he drove at the speed of 45 km/hr and took an hour longer to reach home. What distance did he cover each way?

- (a) 450 km (b) 225 km
(c) 900 km (d) 500 km
(e) None of these

Sol. (a) Let the distance be x km.

$$\text{Then, } \frac{x}{45} - \frac{x}{50} = 1$$

$$\Rightarrow x = \frac{45 \times 50}{5} = 450 \text{ Km.}$$

EXAMPLE ► 5: A 240 - meter long train running at the speed of 60 kmph will take how much time to cross another 270 - meter long train running in the opposite direction at the speed of 48 kmph ?

- (a) 17 seconds (b) 3 seconds
(c) 12 seconds (d) 8 seconds
(e) None of these

Sol. (a) Relative speed

$$= (60 + 48) \times \frac{5}{18}$$

$$= 30 \text{ m/sec.}$$

∴ Time taken

$$= \frac{240 + 270}{30}$$

$$= \frac{510}{30}$$

$$= 17 \text{ seconds}$$

EXERCISE

- A car covers a distance of 816 kms in 12 hours. What is the speed of the car ?
 - 60kmph
 - 62kmph
 - 64kmph
 - cannot be determined
 - None of these
- A bus covers a distance of 2,924 kms in 43 hours. What is the speed of the bus?
 - 72 kmph
 - 60kmph
 - 68kmph
 - Cannot be determined
 - None of these
- A train covers a distance of 1560 kms in 26 hours. What is the speed of the train?
 - 72 kms/hr
 - 62 kms/hr
 - 68 kms/hr
 - Cannot be determined
 - None of these
- A bus travels at the speed of 49 kmph and reaches its destination in 7 hours. What is the distance covered by the bus?
 - 343km
 - 283km
 - 353km
 - 245km
 - 340km
- A car travels a distance of 45 kms at the speed of 15 kmph. It covers the next 50 kms of its journey at the speed of 25 kmph and the last 25 kms of its journey at the speed of 10 kmph. What is the average speed of the car?
 - 40 kmph
 - 24 kmph
 - 15 kmph
 - 18 kmph
 - None of these
- Nilesh goes to school from his village & returns at the speed of 4 km/hr. If he takes 6 hours in all, then what is the distance between the village and the school?
 - 6km
 - 5km
 - 4km
 - Cannot be determined
 - None of these
- A 200 meter long train crosses a platform double its length in 36 seconds. What is the speed of the train in km/hr ?
 - 60
 - 48
 - 64
 - 66
 - None of these
- A 160 meter long train running at a speed of 90 km/h crosses a platform in 18 seconds. What is the length of the platform in meters?
 - 210
 - 240
 - 290
 - 310
 - None of these
- Excluding the stoppages, the speed of a bus is 64 km/hr and including the stoppages the speed of the bus is 48 km/hr. For how many minutes does the bus stop per hour?
 - 12.5 minutes
 - 15 minutes
 - 10 minutes
 - 18 minutes
 - None of these
- A car covers a distance of 540 km in 9 hours. Speed of a train is double the speed of the car. Two-third the speed of the train is equal to the speed of a bike. How much distance will the bike cover in 5 hours ?
 - 450 km
 - 360 km
 - 400 km
 - 500 km
 - None of these
- The ratio between the speed of a train and a car is 18 : 13 . Also, a bus covered a distance of 480 kms. in 12 hours. The speed of the bus is five-ninth the speed of the train. How much distance will the car cover in 5 hours ?
 - 250 km.
 - 280 km.
 - 260 km.
 - Cannot be determined
 - None of these
- A 300 meter long train moving with an average speed of 126 km/hr crosses a platform in 24 seconds. A man crosses the same platform in 5 minutes. What is the speed of the man in meters/second
 - 1.8 m/s
 - 1.2 m/s
 - 1.5 m/s
 - Cannot be determined
 - None of these
- Train A crosses a stationary train B in 35 seconds and a pole in 14 seconds with the same speed. The length of the train A is 280 meters. What is the length of the stationary train B ?
 - 360 meters
 - 480 meters
 - 400 meters
 - Cannot be determined
 - None of these
- A bike covers a certain distance at the speed of 64 km/hr in 8 hours. If a bike was to cover the same distance in approximately 6 hours, at what approximate speed should the bike travel?
 - 80 km./hr.
 - 85 km/hr.
 - 90 km./hr.
 - 75 km/hr.
 - 70 km./hr
- A train running between two stations A and B arrives at its destination 10 minutes late when its speed is 50 km/h and 50 minutes late when its speed is 30km/h. What is the distance between the stations A and B ?
 - 40km
 - 50km
 - 60km
 - 70km
 - None of these
- A train covered a certain distance at a uniform speed. If the train had been 6 km/h faster, then it would have taken 4 hours less than the scheduled time. And, if the train were slower by 6 km/h, then the train would have taken 6 hours more than the scheduled time. The length of the journey is
 - 700km
 - 740km
 - 720km
 - 760km
 - None of these
- On a journey across Bombay, a tourist bus averages 10 km/h for 20% of the distance, 30 km/h for 60% of it and 20 km/h for the remainder. The average speed for the whole journey was
 - 10 km/h
 - 30 km/h
 - 5 km/h
 - 20 km/h
 - None of these

18. A train leaves station X at 5 a.m. and reaches station Y at 9 a.m. Another train leaves station Y at 7 a.m. and reaches station X at 10:30 a.m. At what time do the two trains cross each other ?
 (a) 7:36 am (b) 7:56 am
 (c) 8:36 am (d) 8:56 am
 (e) None of these
19. A man rides a horse at the rate of 11 miles an hour, but stops for 5 min to change horse at the end of every seventh mile. How long will he take to cover a distance of 96 miles ? (Approx.)
 (a) 7 hr. 20 min. (b) 6 hr. 25 min.
 (c) 8 hr. 42 min. (d) 9 hr. 48 min.
 (e) None of these
20. A man starts from B to K and another from K to B at the same time. After passing each other they complete their journeys in $3\frac{1}{3}$ and $4\frac{4}{5}$ hours, respectively. Find the speed of the second man if the speed of the first is 12 km/hr.
 (a) 12.5 kmph (b) 10 kmph
 (c) 12.66 kmph (d) 20 kmph
 (e) None of these
21. The driver of a car driving @ 36 kmph locates a bus 40 meters ahead of him. After 20 seconds the bus is 60 meters behind. The speed of the bus is :
 (a) 36 kmph (b) 20 m/sec.
 (c) 72 m/sec. (d) 18 kmph
 (e) None of these
22. Two trains 100 meters and 120 meters long are running in the same direction with speeds of 72 km/h and 54 km/h. In how much time will the first train cross the second?
 (a) 50 sec (b) 44 sec
 (c) 38 sec (d) 42 sec
 (e) None of these
23. A train overtakes two persons walking along a railway track. The first one walks at 4.5 km/h. The other one walks at 5.4 km/h. The train needs 8.4 and 8.5 seconds respectively to overtake them. What is the speed of the train if both the persons are walking in the same direction as the train?
 (a) 66 km/h (b) 72 km/h
 (c) 78 km/h (d) 81 km/h
 (e) None of these
24. A train 100 metres long takes $3\frac{3}{5}$ seconds to cross a man walking at the rate of 6 km/h in a direction opposite to that of the train. Find the speed of the train.
 (a) 94 m/s (b) 100 m/s
 (c) 110 m/s (d) 108 m/s
 (e) None of these
25. Subbu starts from a point O at 10:00 a.m., overtakes Ajay, who is moving in the same direction, at 11:00 a.m. and Bhuvan moving in the opposite direction at 12:00 (noon). If the speed of Bhuvan is one fourth the speed of Subbu, at what time will Ajay and Bhuvan cross each other ?
 (a) 1:30 p.m. (b) 2:00 p.m.
 (c) 2:30 p.m. (d) Cannot be determined
 (e) None of these
26. A monkey ascends a greased pole 12 meters high. He ascends 2 meters in the first minute and slips down 1 meter in the next minute and so on. In which minute does it reach the top?
 (a) 21st (b) 22nd
 (c) 23rd (d) 24th
 (e) None of these
27. A man covers a certain distance on a scooter. If the scooter moved 4 km/h faster, it would take 30 minutes less. If it moved 2 km/h slower, it would have taken 20 minutes more. Find the distance.
 (a) 60 km (b) 58 km
 (c) 55 km (d) 50 km
 (e) None of these
28. A boat running downstream covers a distance of 16 km in 2 hours while for covering the same distance upstream, it takes 4 hours. What is the speed of the boat in still water?
 (a) 4 km/h (b) 6 km/h
 (c) 8 km/h (d) Data inadequate
 (e) None of these
29. R and S start walking towards each other at 10 AM at the speeds of 3 km/h and 4 km/h respectively. They were initially 17.5 km apart. At what time do they meet?
 (a) 2:30 PM (b) 11:30 AM
 (c) 1:30 PM (d) 12:30 PM
 (e) None of these
30. In a 800 m race around a stadium having the circumference of 200 m, the top runner meets the last runner on the 5th minute of the race. If the top runner runs at twice the speed of the last runner, what is the time taken by the top runner to finish the race ?
 (a) 20 min (b) 15 min
 (c) 10 min (d) 5 min
 (e) None of these
31. A long distance runner runs 9 laps of a 400 meters track everyday. His timings (in minutes) for four consecutive days are 88, 96, 89 and 87 respectively. On an average, how many meters/minute does the runner cover ?
 (a) 40 m/min (b) 45 m/min
 (c) 38 m/min (d) 49 m/min
 (e) None of these
32. Mohan travels 760 km to his home, partly by train and partly by car. He takes 8 hours if he travels 160 km by train and the rest by car. He takes 12 minutes more if he travels 240 km by train and the rest by car. The speed of the train and the car, respectively are:
 (a) 80 km/h, 100 km/h (b) 100 km/h, 80 km/h
 (c) 120 km/h, 120 km/h (d) 100 km/h, 120 km/h
 (e) None of these
33. A boy rows a boat against a stream flowing at 2 kmph for a distance of 9 km, and then turns round and rows back with the current. If the whole trip occupies 6 hours, find the boy's rowing speed in still water.
 (a) 4 kmph (b) 3 kmph
 (c) 2 kmph (d) 5 kmph
 (e) None of these

ANSWER KEY

1	(e)	8	(c)	15	(b)	22	(b)	29	(d)
2	(c)	9	(b)	16	(c)	23	(d)	30	(c)
3	(e)	10	(c)	17	(d)	24	(a)	31	(a)
4	(a)	11	(c)	18	(b)	25	(d)	32	(a)
5	(e)	12	(a)	19	(d)	26	(a)	33	(a)
6	(e)	13	(e)	20	(b)	27	(a)		
7	(a)	14	(b)	21	(d)	28	(b)		

ANSWERS & EXPLANATIONS

1. (e) Speed of the car = $\frac{\text{Distance Covered}}{\text{Time Taken}}$

$$= \frac{816}{12} = 68 \text{ kmph.}$$

2. (c) Speed of bus = $\frac{\text{Distance covered}}{\text{Time taken}}$

$$= \frac{2924}{43} = 68 \text{ kmph.}$$

3. (e) Speed of train = $\frac{1560}{26}$

$$= 60 \text{ kmph.}$$

4. (a) Distance covered = Speed \times Time

$$= 49 \times 7 = 343 \text{ km}$$

5. (e) Time taken to cover a distance of 45 kms

$$\frac{\text{Distance}}{\text{Speed}} = \frac{45}{15} = 3 \text{ hours}$$

Time taken to cover a distance of 50 kms

$$= \frac{50}{25} = 2 \text{ hours}$$

Time taken to cover distance of 25 kms

$$= \frac{25}{10} = 2.5 \text{ hours}$$

Total distance = (45 + 50 + 25) kms = 120 kms

Total time = (3 + 2 + 2.5) hours = 7.5 hours

$$\therefore \text{Required average speed} = \frac{120}{7.5} = 16 \text{ kmph}$$

6. (e) Let the distance between the village and the school be x km.

According to the question,

$$\frac{x}{4} + \frac{x}{2} = 6$$

$$\text{or, } \frac{x+2x}{4} = 6$$

$$\text{or, } 3x = 6 \times 4$$

$$\therefore x = \frac{6 \times 4}{3} = 8 \text{ km}$$

7. (a) Speed of train

$$= \frac{(200 + 400)}{36} \times \frac{18}{5}$$

$$= 60 \text{ km/hr.}$$

8. (c) Distance covered in 18 seconds

$$= 90 \times \frac{5}{18} \times 18 = 450 \text{ m}$$

$$\therefore \text{length of platform}$$

$$= 450 - 160 = 290 \text{ m}$$

9. (b) Stoppage minutes per hour

$$= \frac{(64 - 48) \times 60}{64} = 15 \text{ minutes.}$$

10. (c) Speed of car

$$= \frac{540}{9}$$

= 60 kms/hr.

Speed of bike

$$= 60 \times 2 \times \frac{2}{3}$$

= 80 kms/hr.

Distance covered by bike

$$= 80 \times 5$$

= 400 kms.

11. (c) Speed of bus

$$= \frac{480}{12} = 40 \text{ km/hr}$$

Speed of train

$$= 40 \times \frac{9}{5} = 72 \text{ km/hr}$$

Speed of car

$$= \frac{72}{18} \times 13 = 52 \text{ km/hr}$$

Distance covered by car
 $= 52 \times 5 = 260 \text{ km}$

12. (a) Length of platform

$$= 126 \times \frac{5}{18} \times 24 - 300 = 540 \text{ meter}$$

$$\therefore \text{Speed of man} = \frac{540}{5 \times 60}$$

$$= 1.8 \text{ meter/second}$$

13. (e) Speed of train A = $\frac{280}{14} = 20 \text{ meter/second}$

Length of train B = $20 \times 35 - 280 \text{ meter}$
 $= 700 - 280 \text{ meter}$
 $= 420 \text{ meter}$

14. (b) Distance = 64×8
 $= 512 \text{ km}$

$$\therefore \text{Speed} = \frac{512}{6}$$

= 85 km/hr (approx.)

15. (b) Let the distance between the two stations be x km.

$$\text{Then, } \frac{x}{50} - \frac{10}{60} = \frac{x}{30} - \frac{50}{60}$$

$$\Rightarrow \frac{x}{50} - \frac{1}{6} = \frac{x}{30} - \frac{5}{6}$$

$$\text{or } \frac{x}{30} - \frac{x}{50} = \frac{2}{3} \quad \text{or } x = 50 \text{ km}$$

Thus distance between the station A and B = 50 km

16. (c) Let the length of the journey be x km.
 Suppose speed of the train be y km/h.

$$\therefore \text{Time taken to cover } x \text{ km} = \frac{x}{y} \text{ hours}$$

$$\therefore \frac{x}{y+6} = \frac{x}{y} - 4, \quad \frac{x}{y-6} = \frac{x}{y} + 6$$

Solving these equations, we get
 $y = 30, x = 720$

\therefore Length of the journey = 720 km.

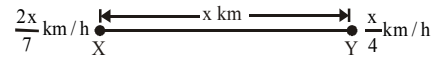
17. (d) Let the average speed be x km/h.
 and Total distance = y km. Then,

$$\frac{0.2}{10}y + \frac{0.6}{30}y + \frac{0.2}{20}y = \frac{y}{x}$$

$$\Rightarrow x = \frac{1}{0.05} = 20 \text{ km/h}$$

18. (b) Let the distance between X and Y be x km.
 Then, the speed of A is

$$\frac{x}{4} \text{ km/h and that of B is } \frac{2x}{7} \text{ km/h.}$$



Relative speeds of the trains

$$= \left(\frac{x}{4} + \frac{2x}{7} \right) = \frac{15x}{28} \text{ km/h}$$

Therefore the distance between the trains at 7 a.m.

$$= x - \frac{x}{2} = \frac{x}{2} \text{ km}$$

Hence, time taken to cross each other

$$= \frac{\frac{x}{2}}{\frac{15x}{28}} = \frac{x}{2} \times \frac{28}{15x} = \frac{14}{15} \times 60 = 56 \text{ min}$$

Thus, both of them meet at 7 : 56 a.m.

19. (d)

Time taken to travel 96 miles

$$= \frac{96}{11} \text{ hrs.} = 8 \text{ hrs and } 43 \text{ minutes}$$

During the journey of 96 miles, he has to stop for 13 times to change the horse.

\therefore Total stoppage time

$$= 13 \times 5 = 65 \text{ mins.} = 1 \text{ hr and } 5 \text{ mins.}$$

Hence the total time

$$= 8 \text{ hrs and } 43 \text{ mins} + 1 \text{ hr and } 5 \text{ mins.}$$

$$= 9 \text{ hrs and } 48 \text{ mins.}$$

20. (b) Ratio of speed = $\frac{\text{1st man's speed}}{\text{2nd man's speed}} = \frac{\sqrt{b}}{\sqrt{a}} = \frac{\sqrt{b}}{\sqrt{a}} = \sqrt{\frac{4}{3} \frac{5}{3}}$

$$= \sqrt{\frac{24}{5} \times \frac{3}{10}} = \sqrt{\frac{36}{25}} = \frac{6}{5}$$

$$\therefore \frac{12}{\text{2nd man's speed}} = \frac{6}{5}$$

$$\therefore \text{2nd man's speed} = \frac{60}{6} = 10 \text{ km/hr.}$$

21. (d) Net distance gained by car over the bus
 $= 40 + 60 = 100 \text{ m, in } 20 \text{ sec.}$

$$\text{Time} = \frac{\text{Distance}}{\text{Relative speed}}$$

$$\Rightarrow 20 = \frac{100}{\left(36 \times \frac{5}{18}\right) - S_2}$$

$$\Rightarrow S_2 = 5 \text{ m/s} = 18 \text{ kmph.}$$

22. (b) Relative speed of the trains
 $= (72 - 54) \text{ km/h} = 18 \text{ km/h}$

$$= \left(18 \times \frac{5}{18}\right) \text{ m/sec} = 5 \text{ m/sec.}$$

Time taken by the trains to cross each other
 = Time taken to cover (100 + 120) m at 5 m/sec
 = $\left(\frac{220}{5}\right)$ sec = 44 sec.

23. (d) $4.5 \text{ km/h} = \left(4.5 \times \frac{5}{18}\right) \text{ m/sec} = 1.25 \text{ m/sec},$

& $5.4 \text{ km/h} = \left(5.4 \times \frac{5}{18}\right) \text{ m/sec} = 1.5 \text{ m/sec}.$

Let the speed of the train be S m/sec.
 Then, $(S - 1.25) \times 8.4 = (S - 1.5) \times 8.5$
 $\Rightarrow 8.4S - 10.5 = 8.5S - 12.75$
 $\Rightarrow 0.1S = 2.25 \Rightarrow S = 22.5.$

\therefore Speed of the train = $\left(22.5 \times \frac{18}{5}\right) \text{ km/h} = 81 \text{ km/h}.$

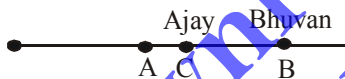
24. (a) Let speed of train be S km/h.
 Speed of train relative to man
 = $[S - (-6)] \text{ km/h}$

= $(S + 6) \times \frac{5}{18} \text{ m/s}$

Now $(S + 6) \times \frac{5}{18} = \frac{100}{18/5}$

$\Rightarrow S = 94 \text{ m/s}$

25. (d) Let the speed of Ajay be V and the speed of Bhuvan and Subbu be 1 and 4 respectively.
 Then OA = 4 and OB = 4.
 At 12:00 noon.



Let Ajay be at C at 12:00 noon at a distance of V from A (towards B)
 \therefore Time taken for them to meet from 12:00 noon.

= $\frac{4 - V}{1 + V}$

Since V is not known $\frac{4 - V}{1 + V}$ cannot be determined.

26. (a) In 2 minutes, he ascends = 1 metre
 \therefore 10 metres, he ascends in 20 minutes.
 \therefore He reaches the top in 21st minute.

27. (a) Let the distance be x km. Let speed of train be y km/h.
 Then by question, we have

$\frac{x}{y + 4} = \frac{x}{y} - \frac{30}{60} \dots(i)$

and $\frac{x}{y - 2} = \frac{x}{y} + \frac{20}{60} \dots(ii)$

On solving (i) and (ii), we get $x = 3y$
 Put $x = 3y$ in (i) we get

$\frac{3y}{y + 4} = 3 - \frac{1}{2} \Rightarrow y = 20$

Hence, distance = $20 \times 3 = 60 \text{ km}.$

28. (b) Rate downstream

= $\left(\frac{16}{2}\right) \text{ kmph} = 8 \text{ kmph};$

Rate upstream

= $\left(\frac{16}{4}\right) \text{ kmph} = 4 \text{ kmph}.$

\therefore Speed in still water

= $\frac{1}{2} (8 + 4) = 6 \text{ km/h}.$

29. (d) Let them meet after t hours, then,

$3t + 4t = 17.5 \Rightarrow t = 2.5$

\therefore Time = 10 am + 2.5 h = 12 : 30pm

30. (c) After 5 minutes (before meeting), the top runner covers 2 rounds i.e., 400 m and the last runner covers 1 round i.e., 200 m.

\therefore Top runner covers 800 m race in 10 minutes.

31. (a) Average speed = $\frac{\text{Total distance}}{\text{Total time}}$

= $\frac{400 \times 4 \times 9}{88 + 96 + 89 + 87} = \frac{400 \times 4 \times 9}{360}$

= 40 metres /minutes

32. (a) Let speed of the train be x km/h and that of the car be y km/h.

Now, $\frac{160}{x} + \frac{600}{y} = 8 \dots(i)$

and $\frac{240}{x} + \frac{520}{y} = \frac{41}{5} \dots(ii)$

Solving (i) and (ii), we have $x = 80 \text{ km/h}$ and $y = 100 \text{ km/h}.$

33. (a) Let the speed of rowing be X. Then the equation formed

is $\frac{9}{X - 2} + \frac{9}{X + 2} = 6.$

On solving, we get the value of X as 4.



AREA & VOLUME

CHAPTER

11

This chapter is based finding on 2D & 3D figures and basically two-dimensional figures come under geometry. Only 3-dimensional figures are studied their area and volume.

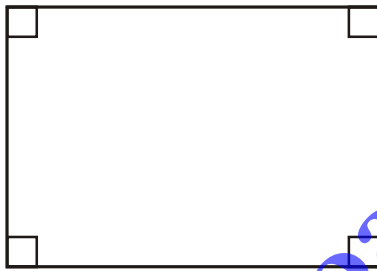
Two Dimensional Figures

- ❖ **Rectangle (opposite sides are equal and intersect each other at an angle of 90°)**

$$\text{Area} = \text{Length} \times \text{breadth}$$

$$\text{Perimeter} = 2(\text{Length} + \text{breadth})$$

$$\text{Diagonal} = \sqrt{(\text{Length})^2 + (\text{breadth})^2}$$

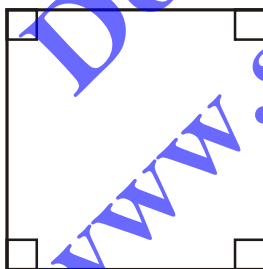


- ❖ **Square (All the four sides are equal and the angle enclosed by adjacent sides is 90°)**

$$\text{Area} = (\text{side})^2$$

$$\text{Perimeter} = 4 \times \text{side}$$

$$\text{Diagonal} = \sqrt{2} \times \text{side}$$



After this all the four sided figures—

Parallelogram

Rhombus

Trapezium & Scalene Quadrilateral should be given.

- ❖ **Triangles**

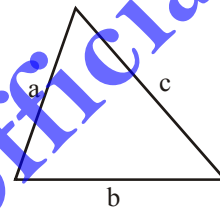
- (i) If a, b and c are the lengths of the first, second and third sides of a triangle respectively, then

$$s = \frac{a+b+c}{2}, \text{ where } s = \text{semi-perimeter}$$

$$\text{and Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

(Heron's formula),

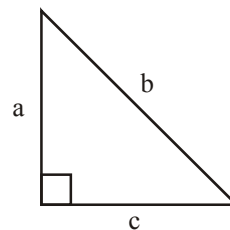
$$\text{Perimeter} = a + b + c$$



- (ii) For a right angled triangle,

$$\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}, \text{ and}$$

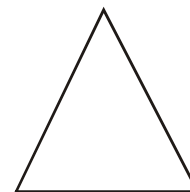
$$\text{Perimeter} = a + b + c$$



- (iii) For an equilateral triangle

$$\text{Area} = \frac{\sqrt{3}}{4} \times (\text{side})^2, \text{ and}$$

$$\text{Perimeter} = 3 \times \text{side}$$

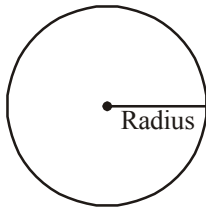


- ❖ **Circle**

$$\text{Area} = \pi \times (\text{Radius})^2$$

$$\text{Circumference} = 2\pi \times \text{Radius}$$

$$\text{Radius} = \frac{\text{Diameter}}{2}$$



- ❖ Area of the walls of a room
 $= 2 \times \text{height} (\text{length} + \text{breadth})$

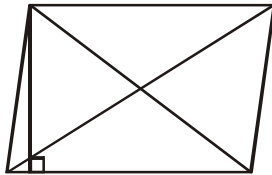
$$\text{Height} = \frac{\text{Wall Area}}{2(\text{length} + \text{breadth})}$$

- ❖ (i) **Parallelogram (Opposite sides are equal & parallel, but angle enclosed by adjacent sides is not a right angle)**

$$\text{Area} = \text{base} \times \text{height}$$

height = length of perpendicular dropped from on opposite side to the base.

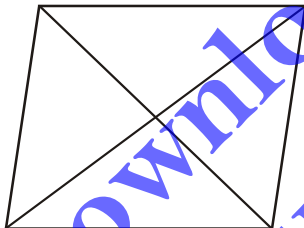
$$\text{Perimeter} = 2 (\text{sum of opposite sides})$$



- (ii) **Rhombus (All the four sides are equal but the angle enclosed by adjacent sides is not a right angle)**

$$\text{Area} = \frac{1}{2} \times \text{product of diagonals}$$

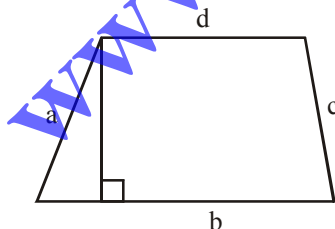
$$\text{Perimeter} = 4 \times \text{side}$$



- (iii) **Trapezium (One pair of opposite side is parallel)**

$$\text{Area} = \frac{1}{2} \times (\text{Sum of parallel sides}) \times \text{height}$$

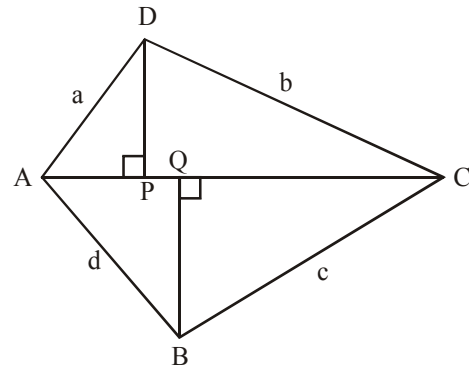
$$\text{Perimeter} = \text{Sum of 4 sides, i.e. } a + b + c + d.$$



- (iv) **Scalene Quadrilateral (All the four sides are unequal and non-parallel)**

$$\text{Area} = \frac{1}{2} (\text{DP} + \text{BQ}) \times \text{AC}$$

$$\text{Perimeter} = \text{Sum of 4 sides, i.e. } a + b + c + d$$



Note :

Area is the portion enclosed by the figure.

Perimeter is the boundary sum of angles of a four sided figure is 360° .

Three dimensional figures

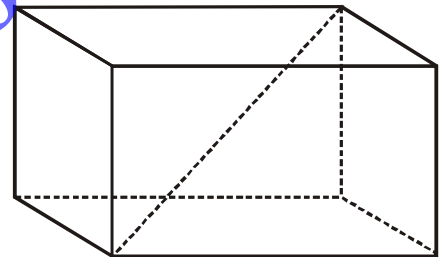
- ❖ **Cuboid**

If L , B and H are length, breadth and height of the cuboid, then

$$\text{Volume} = L \times B \times H$$

$$\text{Surface area} = 2(L \times B + B \times H + H \times L)$$

$$\text{Diagonal} = \sqrt{L^2 + B^2 + H^2}$$



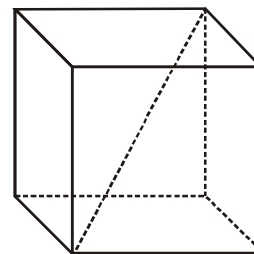
- ❖ **Cube**

If a is each side of the cube, then

$$\text{Volume} = a \times a \times a = a^3$$

$$\text{Surface area} = 2(a \times a + a \times a + a \times a) = 6a^2$$

$$\text{Diagonal of cube} = \sqrt{a^2 + a^2 + a^2} = \sqrt{3}a$$



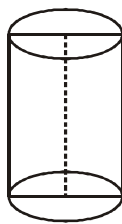
- ❖ **Cylinder**

If radius of cylinder is r and height or length is h , then

$$\text{Volume} = \pi r^2 h$$

$$\text{Lateral surface Area} = 2\pi r h$$

$$\text{Whole surface area} = (2\pi r h + 2\pi r^2)$$



In the above figure,
 R is the radius of the base,
 r is the radius of the top,
 h is the vertical height and L is the slant height.

$$\text{Volume} = \frac{\pi h}{3} (R^2 + r^2 + Rr)$$

$$\text{Slant height} = \sqrt{(R - r)^2 + h^2}$$

$$\text{Curved surface Area} = \pi (R + r) L$$

$$\text{Total surface Area} = \pi (RL + rL + r^2 + R^2)$$

To find height of the original cone, following formula can be used—

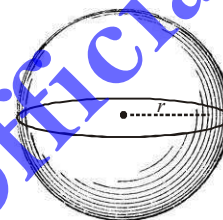
$$H = \frac{Rh}{R - r}$$

❖ **Sphere**

If r is the

radius of the sphere, then volume = $\frac{4}{3} \pi r^3$

$$\text{Surface Area} = 4\pi r^2$$

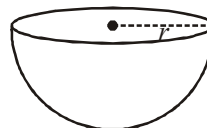


❖ **Hemisphere**

$$\text{Volume} = \frac{2}{3} \pi r^3$$

$$\text{Curved surface area} = 2\pi r^2$$

$$\text{Total surface area} = 2\pi r^2 + \pi r^2 = 3\pi r^2$$



❖ **Cone**

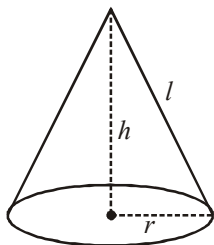
If base-radius, vertical height and slanting height of a cone are r, h and l respectively, then

$$\text{Volume} = \frac{1}{3} \pi r^2 h$$

$$\text{Lateral surface area} = \pi r l$$

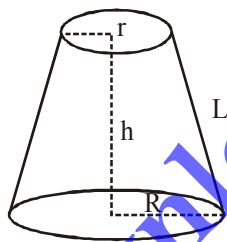
$$\text{Total surface area} = \pi r l + \pi r^2$$

$$\text{Vertical height} = l = \sqrt{r^2 + h^2}$$



Frustum of a cone:

A cone whose top is sliced off, is called frustum of a cone.



Relations to Remember

Some units related to volume

- ❖ 1 litre = 1000 cm³
- ❖ 1 Hectometer³ = 1000000 meter³
- ❖ 1 Decameter³ = 1000 meter³
- ❖ 1 Meter³ = 1000000 cm³
- ❖ 1 Decimeter³ = 1000 cm³
- ❖ 1 Milimeter³ = $\frac{1}{1000}$ cm³

Some units related to area

- ❖ 1 Hectare = 10000 metre square
- ❖ 1 kilometre square = 1000000 metre square
- ❖ 1 Decametre square = 100 metre square
- ❖ 1 Decimeter square = $\frac{1}{100}$ metre square
- ❖ 1 Centimeter square = $\frac{1}{10000}$ metre square
- ❖ 1 Milimeter square = $\frac{1}{1000000}$ metre square

SOLVED EXAMPLES

EXAMPLE 1 : Area of a circular jogging track is 3850 sq. metres. What is the circumference of the jogging track?

- (a) 225 metres (b) 214 metres
(c) 220 metres (d) 235 metres
(e) None of these

Sol. (c) Let the radius of the circular jogging track be r metre.

$$\therefore \pi r^2 = 3850$$

$$\text{or, } \frac{22}{7} \times r^2 = 3850$$

$$\text{or, } r^2 = \frac{3850 \times 7}{22} = 1225$$

$$\therefore r = \sqrt{1225} = 35 \text{ metre}$$

$$\therefore \text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 35 = 220 \text{ metre}$$

Alternative Method:

$$\text{Circumference} = \sqrt{\text{Area} \div \pi} \times 2\pi$$

$$= \sqrt{3850 \div \frac{22}{7}} \times 2 \times \frac{22}{7} = 220 \text{ metres}$$

EXAMPLE 2 : The area of a rectangle is 4 times the area of a square. The length of the rectangle is 90 cm and the breadth of

the rectangle is $\frac{2}{3}$ of the side of the square. What is the side of the square?

- (a) 10cm (b) 20cm
(c) 9cm (d) Cannot be determined
(e) None of these

Sol. (e) Let the side of the square be x cm.

$$\text{Area of square} = x^2$$

$$\text{Area of rectangle} = 90 \times \frac{2}{3}x$$

$$90 \times \frac{2}{3}x = 4x^2 \Rightarrow x = 15 \text{ cm}$$

EXAMPLE 3 : If the perimeter of a square is equal to the radius of a circle whose area is 39424 sq.cms., what is the area of the square?

- (a) 1225 Sq.cms.
(b) 441 Sq.cms.
(c) 784 Sq.cms.
(d) Cannot be determined
(e) None of these

Sol. (c) Radius of circle, $= \sqrt{\frac{39424 \times 7}{22}} = 112 \text{ cm}$

$$\text{Perimeter of square} = 112 \text{ cm.}$$

$$\text{Side of square} = \frac{112}{4} = 28 \text{ cm}$$

$$\therefore \text{Area of square} = 28 \times 28 = 784 \text{ cm}^2$$

EXAMPLE 4 : The length and breadth of a rectangle are in the ratio 9 : 5. If its area is 720 m², find its perimeter.

- (a) 112 metre (b) 115 metre
(c) 110 metre (d) 118 metre
(e) None of these

Sol. (a) Let the length and breadth of a rectangle are $9x$ and $5x$ respectively.

In a rectangle, area = length \times breadth

$$\therefore 720 = 9x \times 5x$$

$$\text{or } x^2 = 16$$

$$\Rightarrow x = 4$$

$$\text{Thus, length} = 9 \times 4 = 36 \text{ m}$$

$$\text{and breadth} = 5 \times 4 = 20 \text{ m}$$

$$\text{Therefore, perimeter of rectangle} \\ = 2(36 + 20) = 112 \text{ m}$$

EXAMPLE 5 : How many squares are there in a 5 inch by 5 inch square grid, if the grid is made up of one inch by one inch squares?

- (a) 50 (b) 150
(c) 55 (d) 25
(e) None of these

Sol. (d) Required no. of squares $= \frac{5^2}{1^2} = 25$

EXAMPLE 6 : The cost of paint is ₹ 36.50 per kg. If 1 kg of paint covers 16 square feet, how much will it cost to paint outside of a cube having 8 feet each side?

- (a) ₹ 692 (b) ₹ 768
(c) ₹ 876 (d) ₹ 972
(e) None of these

Sol. (c) Surface area of the cube
 $= (6 \times 8^2) \text{ sq. ft.} = 384 \text{ sq. ft.}$
Quantity of paint required

$$= \left(\frac{384}{16} \right) \text{ kg} = 24 \text{ kg.}$$

$$\therefore \text{Cost of painting} = ₹ (36.50 \times 24) = ₹ 876.$$

EXAMPLE 7 : The capacity of a cylindrical tank is 246.4 litres. If its height is 4 metres, what is the diameter of the base of the tank?

- (a) 1.4 m (b) 2.8 m
(c) 14 m (d) 4.8 m
(e) None of these

Sol. (e) Volume of the tank $= 246.4 \text{ litres} = 246400 \text{ cm}^3$.

$$\therefore 1\text{l} = 1000 \text{ cm}^3$$

Let the radius of the base be r cm. Then,

$$\left(\frac{22}{7} \times r^2 \times 400 \right) = 246400$$

$$\Rightarrow r^2 = \left(\frac{246400 \times 7}{22 \times 400} \right) = 196$$

$$\Rightarrow r = 14$$

$$\therefore \text{Diameter of the base} = 2r = 28 \text{ cm} = 0.28 \text{ m}$$

EXERCISE

- What is the cost of painting a hall whose area is 729 sq. meters if the rate of painting per square meter is ₹ 28?
 - ₹ 3,042
 - ₹ 3,756
 - ₹ 3,024
 - Cannot be determined
 - None of these
- The floor of a rectangular room is 15 m long and 12 m wide. The room is surrounded by a verandah of width 2 m on all its sides. The area of the verandah is :
 - 124 m^2
 - 120 m^2
 - 108 m^2
 - 58 m^2
 - None of these
- The length of a rectangular plot is twice its breadth. If the area of the rectangular plot is 2592 sq metres, what is the length of the rectangular plot?
 - 76 metre
 - 36 metre
 - 74 metre
 - 37 metre
 - None of these
- The ratio of the length to the breadth of a rectangular plot is 6 : 5 respectively; if the breadth of the plot is 34 metre less than the length, what is the perimeter of the rectangular plot?
 - 374 metres
 - 408 metre
 - 814 metre
 - 748 metre
 - None of these
- An order was placed for supply of carpet of breadth 3 metres, and length 1.44 times of breadth. Subsequently the breadth and length were increased by 25 and 40 percent respectively. At the rate of ₹ 45 per square metre, what would be the increase in the cost of the carpet?
 - ₹ 1020.6
 - ₹ 398.8
 - ₹ 437.4
 - ₹ 583.2
 - None of these
- The length of a rectangular plot is thrice its breadth. If the area of the rectangular plot is 7803 sq. mts., what is the breadth of the rectangular plot?
 - 51 metre
 - 153 metre
 - 104 metre
 - 88 metre
 - None of these
- Area of a rectangle is equal to the area of the circle whose radius is 21 cm. If the length and the breadth of the rectangle are in the ratio of 14 : 11 respectively, what is its perimeter?
 - 142 cm.
 - 140 cm.
 - 132 cm.
 - 150 cm.
 - None of these
- What is the area of a circle whose circumference is 1047.2 metres?
 - 87231.76 sq. m.
 - 85142.28 sq. m.
 - 79943.82 sq. m.
 - 78621.47 sq. m.
 - 69843.23 sq. m.
- The ratio between the angles of a quadrilateral is 3 : 4 : 6 : 5. Two-third the largest angle of the quadrilateral is equal to the smaller angle of a parallelogram. What is the value of adjacent angle to the smaller angle of the parallelogram ?
 - 120°
 - 110°
 - 100°
 - 130°
 - None of these
- The area of a square is 196 sq. cm. Its side is half the radius of a circle. The circumference of the circle is equal to the breadth of a rectangle. If perimeter of the rectangle is 712 cm, what is the length of the rectangle ?
 - 196 cm
 - 186 cm.
 - 180 cm
 - 190 cm
 - None of these
- The total area of a circle and a square together are equal to 2611 sq. cm. The diameter of the circle is 42 cms. What is the sum of the circumference of the circle and the perimeter of the square ?
 - 272 cms.
 - 380 cms.
 - 280 cms.
 - Cannot be determined
 - None of these
- The ratio between three angles of a quadrilateral is 1 : 6 : 2 respectively. The value of the fourth angle of the quadrilateral is 45° . What is the difference between the value of the largest and the smallest angles of the quadrilateral ?
 - 165°
 - 140°
 - 175°
 - 150°
 - None of these
- The area of a triangle is 615 m^2 . If one of its sides is 123 metre, find the length of the perpendicular dropped on that side from opposite vertex.
 - 15 metre
 - 12 metre
 - 10 metre
 - 18 metre
 - None of these
- A square carpet with an area 169 m^2 must have 2 metres cut off one of its edges in order to be a perfect fit for a rectangular room. What is the area of the rectangular room?
 - 180 m^2
 - 164 m^2
 - 152 m^2
 - 143 m^2
 - None of these
- A rectangular plot $15 \text{ m} \times 10 \text{ m}$ has a path of grass outside it. If the area of grassy pathway is 54 m^2 , find the width of the path.
 - 4 m
 - 3 m
 - 2 m
 - 1 m
 - None of these

16. A cylindrical bucket of height 36 cm and radius 21 cm is filled with sand. The bucket is emptied on the ground and a conical heap of sand is formed, the height of the heap being 12 cm. The radius of the heap at the base is :
- (a) 63 cm (b) 53 cm
(c) 56 cm (d) 66 cm
(e) None of these
17. The area of a square field is 576 km^2 . How long will it take for a horse to run around it at the speed of 12 km/h ?
- (a) 12 h (b) 10 h
(c) 8 h (d) 6 h
(e) None of these
18. A cube of 384 cm^2 surface area is melted to make x number of small cubes each of 96 mm^2 surface area. The value of x is
- (a) 80,000 (b) 8
(c) 8,000 (d) 800
(e) None of these
19. A right circular cone and a right circular cylinder have equal base and equal height. If the radius of the base and the height are in the ratio 5 : 12, then the ratio of the total surface area of the cylinder to that of the cone is
- (a) 3 : 1 (b) 13 : 9
(c) 17 : 9 (d) 34 : 9
(e) None of these
20. A spherical ball of lead, 3 cm in diameter, is melted and recast into three spherical balls. The diameter of two of these balls are 1.5 cm and 2 cm respectively. The diameter of the third ball is
- (a) 2.5 cm (b) 2.66 cm
(c) 3 cm (d) 3.5 cm
(e) None of these
21. How many spherical bullets can be made out of a lead cylinder 28 cm high and with base radius 6 cm, each bullet being 1.5 cm in diameter?
- (a) 1845 (b) 1824
(c) 1792 (d) 1752
(e) None of these
22. The length, breadth and height of a cuboid are in the ratio 1 : 2 : 3. The length, breadth and height of the cuboid are increased by 100%, 200% and 200%, respectively. Then, the increase in the volume of the cuboid will be :
- (a) 5 times (b) 6 times
(c) 12 times (d) 17 times
(e) None of these
23. A circular grass lawn of 35 metres in radius has a path 7 metres wide running around it on the outside. Find the area of the path.
- (a) 1694 m^2 (b) 1700 m^2
(c) 1598 m^2 (d) 1750 m^2
(e) None of these
24. The circumference of a circle is 44 metres. Find the area of the circle.
- (a) 154 m^2 (b) 160 m^2
(c) 175 m^2 (d) 168 m^2
(e) None of these
25. Four sheets of $50 \text{ cm} \times 5 \text{ cm}$ are arranged without overlapping to form a square having side 55 cm. What is the area of the inner square so formed?
- (a) 2500 cm^2 (b) 2025 cm^2
(c) 1600 cm^2 (d) 1650 cm^2
(e) None of these
26. The ratio of height of a room to its semi-perimeter is 2 : 5. It costs ₹ 260 to paper the walls of the room with paper 50 cm wide at ₹ 2 per metre allowing an area of 15 sq. m for doors and windows. The height of the room is:
- (a) 2.6 m (b) 3.9 m
(c) 4 m (d) 4.2 m
(e) None of these
27. The length of a rectangular field is double its width. Inside the field there is a square-shaped pond 8 m long. If the area of the pond is $\frac{1}{8}$ of the area of the field, what is the length of the field?
- (a) 32 m (b) 16 m
(c) 64 m (d) 20 m
(e) None of these
28. A cuboidal block of $6 \text{ cm} \times 9 \text{ cm} \times 12 \text{ cm}$ is cut up into an exact number of equal cubes. The least possible number of cubes will be.
- (a) 6 (b) 9
(c) 24 (d) 30
(e) None of these
29. If the radius of a sphere is increased by 2 cm, then its surface area increases by 352 cm^2 . The radius of the sphere before the increase was:
- (a) 3 cm (b) 4 cm
(c) 5 cm (d) 6 cm
(e) None of these
30. If the perimeter and diagonal of a rectangle are 14 cm and 5 cm respectively, find its area.
- (a) 12 cm^2 (b) 16 cm^2
(c) 20 cm^2 (d) 24 cm^2
(e) None of these
31. In an isosceles right angled triangle, the perimeter is 20 metre. Find its area.
- (a) $9,320 \text{ m}^2$ (b) $8,750 \text{ m}^2$
(c) $7,980 \text{ m}^2$ (d) $8,000 \text{ m}^2$
(e) None of these
32. If the area of a circle decreases by 36%, then the radius of the circle decreases by
- (a) 20% (b) 18%
(c) 36% (d) 64%
(e) None of these

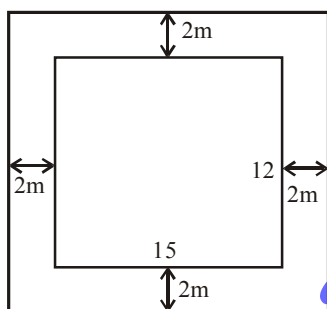
ANSWER KEY

1	(e)	8	(a)	15	(c)	22	(d)	29	(d)
2	(a)	9	(c)	16	(a)	23	(a)	30	(a)
3	(e)	10	(c)	17	(c)	24	(a)	31	(a)
4	(d)	11	(a)	18	(c)	25	(b)	32	(a)
5	(c)	12	(c)	19	(c)	26	(c)		
6	(a)	13	(c)	20	(a)	27	(a)		
7	(d)	14	(d)	21	(c)	28	(c)		

ANSWERS & EXPLANATIONS

1. (e) Cost of painting = $729 \times 28 = 20412 \text{ ₹}$

33. (a) Area of the outer rectangle
= $19 \times 16 = 304 \text{ m}^2$



Area of the inner rectangle = $15 \times 12 = 180 \text{ m}^2$

Required area = $(304 - 180) = 124 \text{ m}^2$

3. (e) Let the breadth of rectangular plot = x metre

\therefore Length = $2x$ metre

According to the question,

$2x \times x = 2592$

or, $x^2 = \frac{2592}{2} = 1296$

$\therefore x = \sqrt{1296} = 36$

\therefore Length of rectangular plot = $2x$

= $2 \times 36 = 72$ metre

4. (d) Length of rectangular plot = $6 \times 34 = 204$ metre

Breadth of rectangular plot

= $5 \times 34 = 170$ metre

\therefore Perimeter = $2(204 + 170)$

= 748 metre

5. (c) Length of carpet

= $3 \times 1.44 = 4.32 \text{ m}$

Area of carpet = $3 \times 4.32 = 12.96 \text{ m}^2$

New area of carpet

= $3 \times \frac{125}{100} \times 4.32 \times \frac{140}{100}$

= 22.68 m^2

\therefore Increase in area

= $22.68 - 12.96$

= 9.72 m^2

\therefore Increase in cost = $9.72 \times 45 = \text{₹ } 437.40$

6. (a) Let the breadth be x metres.

Then, length = $3x$ metres

\therefore Area $\Rightarrow 3x \times x = 7803$

$\Rightarrow x^2 = \frac{7803}{3} = 2601$

$\Rightarrow x = \sqrt{2601} = 51$ metres

7. (d) Area of rectangle

= Area of circle

= $\frac{22}{7} \times 21 \times 21$

= 1386 cm^2

Let the length and breadth of rectangle be $14x$ and $11x$ respectively.

Then $14x \times 11x = 1386$

$\Rightarrow x^2 = \frac{1386}{14 \times 11} = 9$

$\Rightarrow x = \sqrt{9} = 3$

Perimeter of rectangle

= $2(14x + 11x) \Rightarrow 2 \times 25 \times 3$

= 150 cm .

8. (a) Circumference of circle, $2\pi r = 1047.2$

$r = \frac{1047.2 \times 7}{2 \times 22} = 166.6$

\therefore Area of circle, πr^2

$$= \frac{22}{7} \times (166.6)^2$$

$$= 87231.76 \text{ m}^2$$

9. (c) Smaller angle of parallelogram

$$= \frac{6}{18} \times 360 \times \frac{2}{3}$$

$$= 80^\circ$$

$$\text{Adjacent angle of parallelogram} = 180^\circ - 80^\circ = 100^\circ$$

10. (c) Radius of circle

$$= \sqrt{196} \times 2$$

$$= 28 \text{ cms.}$$

Circumference of circle

$$= 2 \times \frac{22}{7} \times 28$$

$$= 176 \text{ cm.}$$

$$\text{So, } 2(L + 176) = 712$$

$$\Rightarrow L = \frac{712}{2} - 176$$

$$= 180 \text{ cm.}$$

11. (a) Area of circle

$$= \frac{22}{7} \times \left(\frac{42}{2}\right)^2$$

$$= 1386 \text{ cm}^2$$

Area of square

$$= 2611 - 1386 = 1225 \text{ cm}^2$$

Side of square

$$= \sqrt{1225} = 35 \text{ cm.}$$

\therefore Required sum

$$= 2 \times \frac{22}{7} \times 21 + 4 \times 35$$

$$= 132 + 140$$

$$= 272 \text{ cm.}$$

12. (c) Value of remaining three angles

$$= 360 - 45^\circ$$

$$= 315^\circ$$

Angles of quadrilateral

$$= 315 \times \frac{1}{9} = 35^\circ$$

$$315 \times \frac{6}{9} = 210^\circ$$

\therefore Required difference

$$= 210 - 35 = 175^\circ$$

13. (c) In a triangle,

$$\text{Area} = \frac{1}{2} \times \text{length of perpendicular} \times \text{base}$$

$$\text{or } 615 = \frac{1}{2} \times \text{length of perpendicular} \times 123$$

$$\therefore \text{Length of perpendicular} = \frac{615 \times 2}{123} = 10 \text{ m.}$$

14. (d) Side of square carpet = $\sqrt{\text{Area}} = \sqrt{169} = 13 \text{ m}$

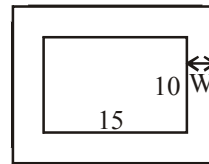
After cutting of one side,

Measure of one side = $13 - 2 = 11 \text{ m}$

and other side = 13 m (remain same)

$$\therefore \text{Area of rectangular room} = 13 \times 11 = 143 \text{ m}^2$$

15. (c)



Let the width of the path = $W \text{ m}$

then, length of plot with path = $(15 + 2W) \text{ m}$

and breadth of plot with path = $(10 + 2W) \text{ m}$

Therefore, Area of rectangular plot (without path)

$$= 15 \times 10 = 150 \text{ m}^2$$

and Area of rectangular plot (with path)

$$= 150 + 54 = 204 \text{ m}^2$$

Hence, $(15 + 2W) \times (10 + 2W) = 204$

$$\Rightarrow 4W^2 + 50W - 54 = 0$$

$$\Rightarrow 2W^2 + 25W - 27 = 0$$

$$\Rightarrow (W - 2)(W + 27) = 0$$

$$\text{Thus } W = 2 \text{ or } -27$$

$$\therefore \text{width of the path} = 2 \text{ m}$$

16. (a) Volume of the bucket = volume of the sand emptied

$$\text{Volume of sand} = \pi (21)^2 \times 36$$

Let r be the radius of the conical heap.

$$\text{Then, } \frac{1}{3} \pi r^2 \times 12 = \pi (21)^2 \times 36$$

$$\text{or } r^2 = (21)^2 \times 9 \text{ or } r = 21 \times 3 = 63 \text{ cm}$$

17. (c) Area of field = 576 km^2 . Then,

$$\text{each side of field} = \sqrt{576} = 24 \text{ km}$$

Distance covered by the horse

$$= \text{Perimeter of square field}$$

$$= 24 \times 4 = 96 \text{ km}$$

$$\therefore \text{Time taken by horse} = \frac{\text{distance}}{\text{speed}} = \frac{96}{12} = 8 \text{ hrs}$$

18. (c) Let 'A' be the side of bigger cube and 'a' be the side of smaller cube

$$\text{Surface area of bigger cube} = 6A^2$$

$$\text{or } 384 = 6A^2$$

$$\therefore A = 8 \text{ cm.}$$

$$\text{Surface area of smaller cube} = 6a^2$$

$$96 = 6a^2$$

$\therefore a = 4 \text{ mm} = 0.4 \text{ cm}$
 So, Number of small cubes

$$= \frac{\text{Volume of bigger cube}}{\text{Volume of smaller cube}}$$

$$= \frac{(8)^3}{(0.4)^3} = \frac{512}{0.064} = 8,000$$

19. (c) Let the radius of the base and height be $5k$ and $12k$ respectively

$$\therefore \frac{\text{Total surface area of the cylinder}}{\text{Total surface area of the cone}}$$

$$= \frac{2\pi r \times h + 2\pi r^2}{\pi r \sqrt{r^2 + h^2} + \pi r^2}$$

$$= \frac{2h + 2r}{\sqrt{r^2 + h^2} + r} + \frac{24k + 10k}{\sqrt{25k^2 + 144k^2} + 5k}$$

$$= \frac{34k}{13k + 5k} = \frac{34k}{18k} = \frac{17}{9}$$

20. (a) Let radius of the 3rd spherical ball be R ,

$$\therefore \frac{4}{3}\pi\left(\frac{3}{2}\right)^3 = \frac{4}{3}\pi\left(\frac{3}{4}\right)^3 + \frac{4}{3}\pi(1)^3 + \frac{4}{3}\pi R^3$$

$$\Rightarrow R^3 = \left[\left(\frac{3}{2}\right)^3 - \left(\frac{3}{4}\right)^3\right] - 1^3$$

$$= \frac{27}{8} - \frac{27}{64} - 1 = \frac{125}{64} = \left(\frac{5}{4}\right)^3 \Rightarrow R = \frac{5}{4} = 1.25$$

 \therefore Diameter of the third spherical ball
 $= 1.25 \times 2 = 2.5 \text{ cm.}$

21. (c) Volume of cylinder
 $= (\pi \times 6 \times 6 \times 28) \text{ cm}^3 = (36 \times 28) \pi \text{ cm}^3.$
 Volume of each bullet
 $= \left(\frac{4}{3}\pi \times \frac{3}{4} \times \frac{3}{4} \times \frac{3}{4}\right) \text{ cm}^3$
 $= \frac{9\pi}{16} \text{ cm}^3.$
 Number of bullets
 $= \frac{\text{Volume of cylinder}}{\text{Volume of each bullet}}$
 $= \left[(36 \times 28) \pi \times \frac{16}{9\pi}\right] = 1792.$

22. (d) Let the length, breadth and height of the cuboid be x , $2x$ and $3x$, respectively.
 Therefore, volume $= x \times 2x \times 3x = 6x^3$

New length, breadth and height $= 2x$, $6x$ and $9x$, respectively.

New volume $= 108x^3$
 Thus, increase in volume $= (108 - 6)x^3 = 102x^3$

$$\frac{\text{Increase in volume}}{\text{Original volume}} = \frac{102x^3}{6x^3} = 17$$

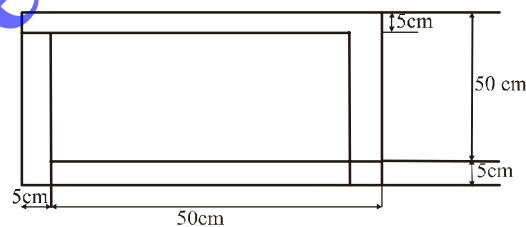
23. (a) Radius of a circular grass lawn (without path) $= 35 \text{ m}$

$\therefore \text{Area} = \pi r^2 = \pi (35)^2$
 Radius of a circular grass lawn (with path)
 $= 35 + 7 = 42 \text{ m}$
 $\therefore \text{Area} = \pi r^2 = \pi (42)^2$
 $\therefore \text{Area of path} = \pi (42)^2 - \pi (35)^2$
 $= \pi (42^2 - 35^2)$
 $= \pi (42 + 35)(42 - 35)$
 $= \pi \times 77 \times 7 = \frac{22}{7} \times 77 \times 7 = 1694 \text{ m}^2$

24. (a) In a circle, circumference $= 2\pi r$

Hence, $44 = 2\pi r \therefore r = \frac{44}{2\pi}$
 Now, area of circle $= \pi r^2$
 $= \pi \times \frac{44}{2\pi} \times \frac{44}{2\pi} = 154 \text{ m}^2$

25. (b)



Side of the inner square $= 55 - 10 = 45$
 \therefore Area of inner square $= 45 \times 45 = 2025 \text{ sq. m.}$

26. (c) Let $h = 2x$ metres and $(l + b) = 5x$ metres.

Length of the paper
 $= \frac{\text{Total cost}}{\text{Rate per m}} = \frac{260}{2} \text{ m} = 130 \text{ m.}$

Area of the paper
 $= \left(130 \times \frac{50}{100}\right) \text{ m}^2 = 65 \text{ m}^2.$

Total area of 4 walls
 $= (65 + 15) \text{ m}^2 = 80 \text{ m}^2.$

$\therefore 2(l + b) \times h = 80$
 $\Rightarrow 2 \times 5x \times 2x = 80$
 $\Rightarrow x^2 = 4 \Rightarrow x = 2.$

\therefore Height of the room $= 4 \text{ m.}$

27. (a) Let width of the field = b m
 \therefore length = $2b$ m
 Now, area of rectangular field = $2b \times b = 2b^2$
 Area of square shaped pond = $8 \times 8 = 64$
 According to the question,
 $64 = \frac{1}{8}(2b^2) \Rightarrow b^2 = 64 \times 4 \Rightarrow b = 16$ m
 \therefore length of the field = $16 \times 2 = 32$ m
28. (c) Volume of block = $(6 \times 9 \times 12) \text{ cm}^3 = 648 \text{ cm}^3$.
 Side of largest cube
 = H.C.F. of 6 cm, 9 cm, 12 cm = 3 cm.
 Volume of the cube = $(3 \times 3 \times 3) = 27 \text{ cm}^3$.
 \therefore Number of cubes = $\left(\frac{648}{27}\right) = 24$.
29. (d) $4\pi(r+2)^2 - 4\pi r^2 = 352$
 $\Rightarrow (r+2)^2 - r^2 = \left(352 \times \frac{7}{22} \times \frac{1}{4}\right) = 28$.
 $\Rightarrow (r+2+r)(r+2-r) = 28$
 $\Rightarrow 2r+2 = \frac{28}{2} \Rightarrow 2r+2 = 14$
 $\Rightarrow r = 6$ cm
30. (a) In a rectangle,
 $\frac{(\text{perimeter})^2}{4} = (\text{diagonal})^2 + 2 \times \text{area}$
 $\Rightarrow \frac{(14)^2}{4} = 5^2 + 2 \times \text{area}$
 $49 = 25 + 2 \times \text{area}$
 $\therefore \text{Area} = \frac{49-25}{2} = \frac{24}{2} = 12 \text{ cm}^2$
31. (a) In an isosceles right angled triangle,
 Area = $23.3 \times \text{perimeter}^2$
 $= 23.3 \times 20^2 = 9320 \text{ m}^2$
32. (a) If area of a circle is decreased by $x\%$ then the radius of the circle decreases by
 $(100 - 10\sqrt{100-x})\% = (100 - 10\sqrt{100-36})\%$
 $= (100 - 10\sqrt{64})\%$
 $= 100 - 80 = 20\%$

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NUMBER SERIES

CHAPTER 12

NUMBER SERIES

Number Series tests are a type of numerical aptitude test which require you to find the missing or wrong number in a sequence. This missing or wrong number may be at the beginning or middle or at the end of sequence.

The only thing to understand for solving these questions is the pattern on which a number series is written. A number series can be framed by using various methods. Therefore, it is advisable for the students to practice as many questions as possible.

Type of Questions

► Type I Find the Missing Number

ILLUSTRATION 1: What should come in place of the question mark (?) in the following number series?

0, 3, 12, 30, ?, 105, 168

Sol.
$$\begin{array}{ccccccc} 0 & 3 & 12 & 30 & \boxed{60} & 105 & 168 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +3 & +9 & +18 & +30 & +45 & +63 & \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \\ +6 & +9 & +12 & +15 & +18 & & \end{array}$$

ILLUSTRATION 2: What should come in place of the question mark (?) in the following number series?

2 9 30 105 ? 2195

Sol. The series is as follows starting from the second number denote the previous number in the series by x .

$$x \times 1 + 1 \times 7, x \times 2 + 2 \times 6, x \times 3 + 3 \times 5, x \times 4 + 4 \times 4, x \times 5 + 5 \times 3$$

So the missing number ? = 436

ILLUSTRATION 3: What should come in place of the question mark (?) in the following number series?

3 4 12 45 ? 1005

Sol. The series is as follows starting from second number

$$x \times 1 + 1^2, x \times 2 + 2^2, x \times 3 + 3^2, x \times 4 + 4^2, x \times 5 + 5^2$$

(x denotes the previous number in the series)

$$\therefore ? = x \times 4 + 4^2 = 45 \times 4 + 16 = 196$$

► Type II Find the Next Number

ILLUSTRATION 4: What should be the next number in the following number series?

48, 32, 24, 20

Sol.
$$\begin{array}{ccccccc} 48 & 32 & 24 & 20 & \boxed{18} \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ -16 & -8 & -4 & -2 & \end{array}$$

ILLUSTRATION 5: What should be the next number in the following number series?

198, 194, 185, 169,

Sol.
$$\begin{array}{ccccccc} 198 & 194 & 185 & 169 & \boxed{144} \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ -2^2 & -3^2 & -4^2 & -5^2 & \end{array}$$

ILLUSTRATION 6: What should be the next number in the following number series?

6, 9, 7, 10, 8, 11,

Sol. The series is as follows

$$\begin{array}{ccccccc} 6 & 9 & 7 & 10 & 8 & 11 & \boxed{9} \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +3 & -2 & +3 & -2 & +3 & -2 & \end{array}$$

ILLUSTRATION 7: What should be the next number in the following number series?

0, 2, 6, 12, 20,

Sol.
$$\begin{array}{ccccccc} 0 & 2 & 6 & 12 & 20 & \boxed{30} \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +2 & +4 & +6 & +8 & +10 & \end{array}$$

► Type III Find the Wrong Number

ILLUSTRATION 8: In the following number series, a wrong number is given. Find out that wrong number.

9, 15, 24, 34, 51, 69, 90

Sol.
$$\begin{array}{ccccccc} 9 & 15 & 24 & \boxed{34} & 51 & 69 & 90 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ +6 & +9 & +12 & +15 & +18 & +21 & \end{array}$$

ILLUSTRATION 9: In the following number series, a wrong number is given. Find out that wrong number.

10 15 24 35 54 75 100

Sol. The series is as follows

+5, +9, +13, +17 ... difference of two consecutive terms ($9 - 5 = 13 - 9 = 17 - 13$) is 4.

Hence, 35 is wrong number in the series. It should be 37.

ILLUSTRATION 10: In the following number series, a wrong number is given. Find out that wrong number.

1 3 4 7 11 18 27 47

Sol. Third number is the sum of first two numbers

Hence 27 is wrong number in the series. It should be 29.

SOLVED EXAMPLES

EXAMPLE ▶ 1 : What should come in place of the question mark (?) in the following number series?

18 38 120 ? 2480 14910

- (a) 394 (b) 450
(c) 492 (d) 486
(e) None of these

Sol. (c) The given number series is based on the following pattern:

$$18 \times 2 + 2 \times 1 = 38$$

$$38 \times 3 + 3 \times 2 = 120$$

$$120 \times 4 + 4 \times 3 = \boxed{492}$$

$$492 \times 5 + 5 \times 4 = 2480$$

$$2480 \times 6 + 6 \times 5 = 14910$$

Hence, 492 will come in place of the question mark.

EXAMPLE ▶ 2 : What should come in place of the question mark (?) in the following number series?

1 3 9 31 ? 651

- (a) 97 (b) 127
(c) 129 (d) 109
(e) None of these

Sol. (c) The series is as follows
 $\times 1 + 2, \times 2 + 3, \times 3 + 4, \dots$

EXAMPLE ▶ 3 : What should come in place of the question mark (?) in the following number series?

5 ? 4 7.5 17 45

- (a) 3.5 (b) 3
(c) 2.5 (d) 2
(e) None of these

Sol. (b) The series is as follows
 $\times 0.5 + 0.5, \times 1 + 1, \times 1.5 + 1.5, \dots$

EXAMPLE ▶ 4 : What should come in place of the question mark (?) in the following number series?

15 30 ? 40 8 48

- (a) 10 (b) 20
(c) 18 (d) 12
(e) None of these

Sol. (a) The series is as follows

$$\times 2, \times \frac{1}{3}, \times 4, \times \frac{1}{5}, \dots$$

EXAMPLE ▶ 5 : In the following number series one of the numbers is wrong. Find out the wrong number.

14 28 112 672 5374 53760

- (a) 112 (b) 672
(c) 5374 (d) 28
(e) None of these

Sol. (c) The sequence is
 $\times 2, \times 4, \times 6, \times 8, \times 10$
5374 should be 5376

EXAMPLE ▶ 6 : In the following number series one of the numbers is wrong. Find out the wrong number.

3 2 3 6 12 37.5 115.5

- (a) 37.5 (b) 3
(c) 6 (d) 2
(e) 12

Sol. (e) The series is as follows
 $\times 0.5 + 0.5, \times 1 + 1, \times 1.5 + 1.5 \dots$
Hence, 12 is wrong number in the series, it should be 14.

EXAMPLE ▶ 7 : What should be the next number in the following number series?

6 42 294 2058 14406 ?

- (a) 100842 (b) 72030
(c) 86436 (d) 115248
(e) 129654

Sol. (a) $6 \times 7 = 42$
 $42 \times 7 = 294$
 $294 \times 7 = 2058$
 $2058 \times 7 = 14406$
 $14406 \times 7 = 100842$

EXAMPLE ▶ 8 : What should be the next number in the following number series?

20 33 50 69 92 ?


- (a) 196 (b) 100
(c) 169 (d) 144
(e) 121

Sol. (e) Here,
 $20 + 13 = 33$
 $33 + 17 = 50$
 $50 + 19 = 69$
 $69 + 23 = 92$
 $92 + 29 = 121$

EXAMPLE ▶ 9 : What should be the next number in the following number series?

5, 6, 8, 9, 11,

- (a) 15 (b) 12
(c) 17 (d) 20
(e) None of these

Sol. (b) 

EXAMPLE ▶ 10 : What should be the next number in the following number series?

35, 30, 25, 20, 15, 10,

- (a) 15 (b) 10
(c) 5 (d) 2
(e) None of these

Sol. (c) Series is in descending order of 5.

EXERCISE

1. What should come in place of the question mark (?) in the following number series?
3 3 12 108 ? 43200
(a) 2700 (b) 1728
(c) 972 (d) 432
(e) None of these
2. What should come in place of the question mark (?) in the following number series?
8 20 50 125 ? 781.25
(a) 300 (b) 295.5
(c) 315 (d) 312.5
(e) None of these
- Directions (Q. 3-7): In the following number series, a wrong number is given. Find out that wrong number.**
3. 2 11 38 197 1172 8227 65806
(a) 11 (b) 38
(c) 197 (d) 1172
(e) 8227
4. 16 19 21 30 46 71 107
(a) 19 (b) 21
(c) 30 (d) 46
(e) 71
5. 7 9 16 25 41 68 107 173
(a) 107 (b) 16
(c) 41 (d) 68
(e) 25
6. 4 2 3.5 7.5 26.25 118.125
(a) 118.125 (b) 26.25
(c) 3.5 (d) 2
(e) 7.5
7. 16 4 2 1.5 1.75 1.875
(a) 1.875 (b) 1.75
(c) 1.5 (d) 2
(e) 4
- Directions (Q. 8-28): What should come in place of the question mark (?) in the following number series.**
8. 12 6.5 7.5 12.75 27.5 71.25 ?
(a) 225.75 (b) 216.75
(c) 209.75 (d) 236.75
(e) 249.75
9. 16 24 36 54 81 121.5 ?
(a) 182.25 (b) 174.85
(c) 190.65 (d) 166.55
(e) 158.95
10. 12 12 18 45 180 1170 ?
(a) 13485 (b) 14675
(c) 15890 (d) 16756
(e) 12285
11. 22 23 27 36 52 77 ?
(a) 111 (b) 109
(c) 113 (d) 117
(e) 115
12. 16 14 24 66 256 1270 ?
(a) 8564 (b) 5672
(c) 4561 (d) 7608
(e) 6340
13. 6417, 5704, 4991, 4278, 3565, 2852 ?
(a) 2408 (b) 2426
(c) 7310 (d) 7130
(e) 2139
14. 3 7 13 ? 31 43
(a) 18 (b) 19
(c) 23 (d) 21
(e) None of these
15. 250, 100, 40 ? 6.4, 2.56
(a) 16 (b) 20
(c) 24 (d) 12
(e) None of these
16. 13 20 14 19 15 ?
(a) 16 (b) 18
(c) 21 (d) 17
(e) 20
17. 9 27 36 63 99 ?
(a) 151 (b) 167
(c) 152 (d) 162
(e) 157
18. 7 26 63 124 215 ?
(a) 330 (b) 321
(c) 342 (d) 356
(e) 339
19. 7413 7422 7440 ? 7503 7548
(a) 7464 (b) 7456
(c) 7466 (d) 7477
(e) None of these

20. 4 16 36 64 100 ?
 (a) 120 (b) 180
 (c) 136 (d) 144
 (e) None of these
21. 12 33 96 ? 852 2553
 (a) 285 (b) 288
 (c) 250 (d) 384
 (e) None of these
22. 70000 14000 2800 ? 112 22.4
 (a) 640 (b) 420
 (c) 560 (d) 540
 (e) None of these
23. 102 104 99 97 106 ?
 (a) 96 (b) 95
 (c) 100 (d) 94
 (e) None of these
24. 0 5 18 43 84 145 ?
 (a) 220 (b) 240
 (c) 260 (d) 280
 (e) None of these
25. 10 17 48 165 688 3475 ?
 (a) 27584 (b) 25670
 (c) 21369 (d) 20892
 (e) None of these
26. 1 3 24 360 8640 302400 ?
 (a) 14525100
 (b) 154152000
 (c) 14515200
 (d) 15425100
 (e) None of these
27. 12 14 32 102 416 2090 ?
 (a) 15522 (b) 12552
 (c) 13525 (d) 17552
 (e) None of these
28. 10 25 50 75 75 37.5 ?
 (a) 4.375 (b) 3.2375
 (c) 4.6275 (d) 3.575
 (e) None of these
- Directions (Q. 29-33) : In the following number series only one number is wrong. Find out the wrong number.**
29. 4 6 18 49 201 1011
 (a) 1011 (b) 201
 (c) 18 (d) 49
 (e) None of these
30. 48 72 108 162 243 366
 (a) 72 (b) 108
 (c) 162 (d) 243
 (e) None of these
31. 2 54 300 1220 3674 7350
 (a) 3674 (b) 1220
 (c) 300 (d) 54
 (e) None of these
32. 8 27 64 125 218 343
 (a) 27 (b) 218
 (c) 125 (d) 343
 (e) None of these
33. 19 68 102 129 145 154
 (a) 154 (b) 129
 (c) 145 (d) 102
 (e) None of these
- Directions (Q. 34-53) : What should come in place of the question mark (?) in the following number series?**
34. 10 14 25 55 140 (?)
 (a) 386 (b) 398
 (c) 388 (d) 396
 (e) None of these
35. 119 131 155 191 239 (?)
 (a) 289 (b) 290
 (c) 279 (d) 280
 (e) None of these
36. 11 57 149 333 701 (?)
 (a) 1447 (b) 1347
 (c) 1368 (d) 1437
 (e) None of these
37. 697 553 453 389 353 (?)
 (a) 328 (b) 337
 (c) 362 (d) 338
 (e) None of these
38. 336 224 168 140 126 (?)
 (a) 119 (b) 118
 (c) 116 (d) 121
 (e) None of these
39. 588 587 583 574 558 ? 497
 (a) 545 (b) 543
 (c) 551 (d) 557
 (e) None of these

40. 64 54 69 49 74 44 ?
(a) 89 (b) 69
(c) 59 (d) 99
(e) None of these
41. 4000 2008 1012 ? 265 140.5 78.25
(a) 506 (b) 514
(c) 520 (d) 512
(e) None of these
42. 5 5 15 75 ? 4725 51975
(a) 520 (b) 450
(c) 525 (d) 300
(e) None of these
43. 52 26 26 39 78 ? 585
(a) 195 (b) 156
(c) 234 (d) 117
(e) None of these
44. 29, 23, ?, 17, 13, 11, 7
(a) 19 (b) 21
(c) 23 (d) 27
(e) None of these
45. 8, 15, 28, 53, ?
(a) 106 (b) 98
(c) 100 (d) 102
(e) None of these
46. 24, 49, ?, 94, 15, 31, 59, 58
(a) 51 (b) 63
(c) 77 (d) 95
(e) None of these
47. 5, 10, 13, 26, 29, 58, ?, 122
(a) 60 (b) 61
(c) 111 (d) 91
(e) None of these
48. 2, 3, 10, 15, 26, ?, 55
(a) 32 (b) 33
(c) 34 (d) 35
(e) None of these
49. 2, 4, ?, 16, 32
(a) 6 (b) 10
(c) 8 (d) 12
(e) None of these
50. 0, 7, 26, ?, 124, 215
(a) 37 (b) 51
(c) 63 (d) 88
(e) None of these
51. 4, 15, 16, ?, 36, 63, 64
(a) 25 (b) 30
(c) 32 (d) 35
(e) None of these
52. 1, 8, 9, ?, 25, 216, 49
(a) 60 (b) 64
(c) 70 (d) 75
(e) None of these
53. 336, 210, 120, ?, 24, 6, 0
(a) 40 (b) 50
(c) 60 (d) 70
(e) None of these

ANSWER KEY

1	(b)	12	(d)	23	(b)	34	(c)	45	(d)
2	(d)	13	(e)	24	(e)	35	(e)	46	(d)
3	(d)	14	(d)	25	(d)	36	(d)	47	(b)
4	(a)	15	(a)	26	(c)	37	(b)	48	(d)
5	(d)	16	(b)	27	(b)	38	(a)	49	(c)
6	(c)	17	(d)	28	(e)	39	(e)	50	(c)
7	(b)	18	(c)	29	(c)	40	(e)	51	(d)
8	(b)	19	(e)	30	(e)	41	(b)	52	(b)
9	(a)	20	(d)	31	(a)	42	(c)	53	(c)
10	(e)	21	(a)	32	(b)	43	(a)		
11	(c)	22	(c)	33	(d)	44	(a)		

ANSWERS & EXPLANATIONS

1. (b) The pattern of the series is as follows
 $\times 1^2, \times 2^2, \times 3^2, \times 4^2, \times 5^2$
Hence, required number = 1728.
2. (d) The pattern of the series is as follows :
 $8 \times 2.5 = 20$
 $20 \times 2.5 = 50$
 $50 \times 2.5 = 125$
 $\therefore ? = 125 \times 2.5 = 312.5$
3. (d) The series is based on the following pattern:
 $2 \times 3 + 5 = 11$
 $11 \times 4 - 6 = 38$
 $38 \times 5 + 7 = 197$
 $197 \times 6 - 8 = \boxed{1174}$; not 1172
 $1174 \times 7 + 9 = 8227$
 $8227 \times 8 - 10 = 65806$
Clearly, 1172 is the wrong number and it should be replaced by 1174.
4. (a) The series is based on the following pattern :
 $16 + 1^2 = 17$; not $\boxed{19}$
 $17 + 2^2 = 21$
 $21 + 3^2 = 30$
 $30 + 4^2 = 46$
 $46 + 5^2 = 71$
 $71 + 6^2 = 107$
Clearly, 19 should be replaced by 17.
5. (d) The series is based on the following pattern :
 $7 + 9 = 16$
 $9 + 16 = 25$
 $16 + 25 = 41$
 $25 + 41 = 66$; $\boxed{68}$
 $41 + 66 = 107$
 $66 + 107 = 173$
Clearly, 68 should be replaced by 66.
6. (c) The series is based on the following pattern
 $4 \times .5 = 2$
 $2 \times 1.5 = \boxed{3}$; not 3.5
 $3 \times 2.5 = 7.5$
 $7.5 \times 3.5 = 26.25$
 $26.25 \times 4.5 = 118.125$
Clearly, 3.5 should be replaced by 3.
7. (b) The series is based on the following pattern:
 $16 \times 0.25 = 4$
 $4 \times 0.50 = 2$
 $2 \times 0.75 = 1.5$
 $1.5 \times 1.00 = \boxed{1.5}$; not 1.75
 $1.5 \times 1.25 = 1.875$
Clearly, 1.75 should be replaced by 1.5.
8. (b) The given number series is based on the following pattern:
 $12 \times 0.5 + 0.5 = 6.5$
 $6.5 \times 1 + 1 = 7.5$
 $7.5 \times 1.5 + 1.5 = 12.75$
 $12.75 \times 2 + 2 = 27.5$
 $27.5 \times 2.5 + 2.5 = 71.25$
 $\therefore ? = 71.25 \times 3 + 3$
 $= 213.75 + 3 = 216.75$
Hence, 216.75 will replace the question mark.
9. (a) The given number series is based on the following pattern:
 $16 \times \frac{3}{2} = 8 \times 3 = 24$
 $24 \times \frac{3}{2} = 12 \times 3 = 36$
 $36 \times \frac{3}{2} = 18 \times 3 = 54$

$$54 \times \frac{3}{2} = 81$$

$$81 \times \frac{3}{2} = 121.5$$

$$\therefore ? = 121.5 \times \frac{3}{2} = 182.25$$

Hence, the number 182.25 will replace the question mark.

10. (e) The pattern of series is as follows :

$$12 \times 1 = 12,$$

$$12 \times 1.5 = 18, [0.5 + 1 = 1.5]$$

$$18 \times 2.5 = 45, [1 + 1.5 = 2.5]$$

$$45 \times 4 = 180, [1.5 + 2.5 = 4]$$

$$180 \times 6.5 = 1170, [2.5 + 4 = 6.5]$$

$$\therefore ? = 1170 \times 10.5 = 12285$$

Hence, 12285 will replace the question mark.

11. (c) The given number series is based on the following pattern:

$$22 + 1^2 = 22 + 1 = 23$$

$$23 + 2^2 = 23 + 4 = 27$$

$$27 + 3^2 = 27 + 9 = 36$$

$$36 + 4^2 = 36 + 16 = 52$$

$$52 + 5^2 = 52 + 25 = 77$$

$$\therefore ? = 77 + 6^2$$

$$= 77 + 36 = 113$$

12. (d) The given number series is based on the following pattern:

$$16 \times 1 - 2 = 14$$

$$14 \times 2 - 4 = 24$$

$$24 \times 3 - 6 = 66$$

$$66 \times 4 - 8 = 256$$

$$256 \times 5 - 10 = 1270$$

$$\therefore ? = 1270 \times 6 - 12$$

$$= 7620 - 12 = 7608$$

Hence, 7608 will replace the question mark.

13. (e) The given number series is based on the following pattern:

$$6417 - 713 = 5704$$

$$5704 - 713 = 4991$$

$$4991 - 713 = 4278$$

$$4278 - 713 = 3565$$

$$3565 - 713 = 2852$$

$$? = 2852 - 713 = 2139$$

Hence, 2139 will replace the question mark.

14. (d) The given number series is based on the following pattern:

$$7 + 6 = 13$$

$$13 + 8 = \boxed{21}$$

$$21 + 10 = 31$$

$$31 + 12 = 43$$

Hence, the number 21 will replace the question mark.

15. (a) The given number series is based on the following pattern:

$$250 \div_{2.5} 100 \div_{2.5} 40 \div_{2.5} 16 \div_{2.5} 6.4 \div_{2.5} 2.56$$

Hence, the number 16 will replace the question mark.

$$16. (b) \quad 13 \quad \overbrace{20 \quad 14} \quad \overbrace{19 \quad 15} \quad ?$$

Hence, question mark (?) should be replaced by 18.

17. (d) Here,

$$9 + 27 = 36$$

$$27 + 36 = 63$$

$$36 + 63 = 99$$

$$63 + 99 = 162.$$

18. (c) $7 = 2^3 - 1$

$$26 = 3^3 - 1$$

$$63 = 4^3 - 1$$

$$124 = 5^3 - 1$$

$$215 = 6^3 - 1$$

$$? = 7^3 - 1 = 342$$

19. (e) The series is as follows

$$+ 9, + 18, + 27, + 36, + 45$$

$$\text{Hence, } ? = 7440 + 27 = 7467$$

20. (d) The series is as follows

$$(2)^2, (4)^2, (6)^2, (8)^2, (10)^2, (12)^2$$

$$\text{Hence, } ? = (12)^2 = 144$$

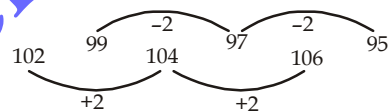
21. (a) The series is as follows: $\times 3 - 3$

$$\text{Hence, } ? = 96 \times 3 - 3 = 285$$

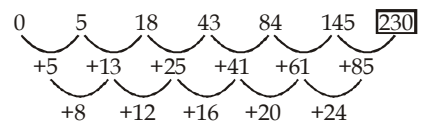
22. (c) The series is as follows: $\div 5$

$$\text{Hence, } ? = 2800 \div 5 = 560$$

23. (b) The series is as follows



24. (e)



25. (d) The series is as follows

$$\times 1 + (7 \times 1), \times 2 + (7 \times 2), \times 3 + (7 \times 3), \times 4 + (7 \times 4),$$

$$\times 5 + (7 \times 5), \times 6 + (7 \times 6) \dots$$

$$\text{Hence, } ? = 3475 \times 6 + (7 \times 6)$$

$$= 20892$$

26. (c) The series is as follows

$$\times 3, \times 8, \times 15, \times 24, \times 35, \times 48$$

$$\text{Hence, } ? = 302400 \times 48$$

$$= 14515200$$

27. (b) The series is as follows

$$\times 1 + 2, \times 2 + 4, \times 3 + 6, \times 4 + 8, \times 5 + 10, \times 6 + 12 \dots$$

$$\text{Hence, } ? = 2090 \times 6 + 12 = 12552$$

28. (e) The series is as follows

$$\times 2.5, \times 2, \times 1.5, \times 1, \times 0.5, \times 0$$

$$\text{Hence, } ? = 37.5 \times 0 = 0$$

29. (c) The series is

$$\times 1 + 2, \times 2 + 3, \times 3 + 4, \times 4 + 5, \times 5 + 6$$

The wrong number is 18.

$$\text{It should be } 6 \times 2 + 3 = 15$$

30. (e) The series is $\times 1.5$
The wrong number is 366
It should be $243 \times 1.5 = 364.5$
31. (a) The series is
 $\times 6 + 42, \times 5 + 30, \times 4 + 20, \times 3 + 12, \times 2 + 6,$
The wrong number is 3674
It should be $1220 \times 3 + 12 = 3672$
32. (b) The series is $(2)^3, (3)^3, (4)^3, (5)^3, (6)^3, (7)^3,$
The wrong number is 218
It should be $(6)^3 = 216$
33. (d) The series is $+(7)^2, +(6)^2, +(5)^2, +(4)^2, +(3)^2$
The wrong number is 102.
It should be $68 + (6)^2 = 104$
34. (c) The series is as follows:
 $\times 3 - 16, \times 3 - 17, \times 3 - 20, \times 3 - 25, \times 3 - 32$
Hence, $? = 140 \times 3 - 32 = 388$
35. (e) The series is as follows:
 $+(12 \times 1), +(12 \times 2), +(12 \times 3), +(12 \times 4), +(12 \times 5)$
Hence, $? = 239 + (12 \times 5) = 299$
36. (d) The series is as follows: $\times 2 + 35$
Hence, $? = 701 \times 2 + 35 = 1437$
37. (b) The series is as follows:
 $- 12^2, - 10^2, - 8^2, - 6^2, - 4^2$
Hence, $? = 353 - 4^2 = 337$
38. (a) The series is as follows:
 $- 112, - 56, - 28, - 14, - 7$
Hence, $? = 126 - 7 = 119$
39. (e) The series is as follows:
 $- 1^2, - 2^2, - 3^2, - 4^2, - 5^2, - 6^2$
Hence, $? = 558 - 5^2 = 533$
40. (e) The series is as follows:
 $64 + 5 = 69;$
 $69 + 5 = 74;$
 $74 + 5 = \boxed{79}$
 $54 - 5 = 49;$
 $49 - 5 = 44$
41. (b) The series is as follows:
 $\div 2 + 8$
Hence, $? = 1012 \div 2 + 8 = 514$
42. (c) The series is as follows:
 $\times 1, \times 3, \times 5, \times 7, \times 9, \times 11$
Hence, $? = 75 \times 7 = 525$
43. (a) The series is as follows:
 $\times \frac{1}{2}, \times 1, \times 1\frac{1}{2}, \times 2, \times 2\frac{1}{2}, \times 3$
Hence, $? = 78 \times 2\frac{1}{2} = 195$
44. (a) This is a series of prime numbers :
45. (d) Let $x = 8$
then $15 = 2x - 1 = y$
 $28 = 2y - 2 = z$
 $53 = 2z - 3 = m$
Next term in the pattern should be
 $2m - 4 = 2 \times 53 - 4$
 $= 102$
46. (d) It is a combination of two series, namely
24, 49, ?, 94; and 15, 31, 59, 58
The two series correspond to
 $x, (2x + 1), (4x - 1), (4x - 2)$
Hence the missing term is
 $4 \times 24 - 1 = 95$
47. (b) Add 3 after doubling the previous number.
48. (d) The series exhibits the pattern of $n^2 + 1, n^2 - 1,$
alternatively, n taking values 1, 2, 1
49. (c) The terms exhibit the pattern $2^1, 2^2, 2^3$ and so on.
50. (c) Try the pattern $n^3 - 1, n = 1, 2, \dots$
51. (d) Pattern is $2^2, 4^2 - 1, 4^2, 6^2 - 1, 6^2$ and so on.
52. (b) Can you see that the pattern is
 $1^2, 2^3, 3^2, 4^3, 5^2, 6^3, 7^2$
53. (c) Note that
 $0 = 1^3 - 1$
 $6 = 2^3 - 2$
 $24 = 3^3 - 3$



DATA INTERPRETATION

CHAPTER

13

DATA INTERPRETATION

Data Interpretation is interpreting the available information on the basis of requirement. The available data is presented either in the form of a table or a bar chart or a pie chart or a line graph or as a combination of one of these formats from which you will have to interpret and analyse the data. These types of questions test your speed, decision making capability and capability of analyzing data and extracting required information there from.

SOLVED EXAMPLES

Type 1 Data Interpretation based on Data Table

Study the following table to answer the given questions.

Percentage of Marks obtained by Seven Students in six subjects

Subjects	English	History	Comp.	Maths	Science	Eco.
Maximum marks	(60)	(40)	(130)	(150)	(120)	(80)
Students						
Meera	100	80	50	90	90	60
Subodh	80	70	80	100	80	40
Kunal	90	70	60	90	70	70
Soni	60	60	65	80	80	80
Richu	50	90	62	80	85	95
Irene	40	60	64	70	65	85
Vijay	80	80	35	65	30	75

EXAMPLE 1: What are the total marks obtained by Meera in all the subjects ?

- (a) 448 (b) 589
(c) 470 (d) 74.67
(e) None of these

Sol. (a) Mark obtained by Meera in total subjects

$$\begin{aligned} &= \frac{100 \times 60}{100} + \frac{80 \times 40}{100} + \frac{130 \times 50}{100} + \frac{150 \times 90}{100} \\ &+ \frac{120 \times 90}{100} + \frac{80 \times 60}{100} \\ &= 60 + 32 + 65 + 135 + 108 + 48 = 448 \end{aligned}$$

EXAMPLE 2: What are the average marks obtained by these seven students in History? (round off to two digits)

- (a) 72.86 (b) 27.32
(c) 24.86 (d) 29.14
(e) None of these

Sol. (d) Marks obtained by all seven students

$$\begin{aligned} &= \frac{40}{100} (80 + 70 + 70 + 60 + 90 + 60 + 80) \\ &= \frac{40}{100} \times 510 = 204 \end{aligned}$$

$$\therefore \text{Average marks} = \frac{204}{7} = 29.14$$

EXAMPLE 3: How many students have got 60% or more marks in all the subjects?

- (a) One (b) Two
(c) Three (d) zero
(e) None of these

Sol. (b) Only two students, Kunal and Soni have got 60% or above marks in all subjects.

EXAMPLE 4: What is the overall percentage of Kunal?

- (a) 64 (b) 65
(c) 75 (d) 64.24
(e) None of these

Sol. (c) Total marks obtained by Kunal

$$\begin{aligned} &= \frac{60 \times 90}{100} + \frac{40 \times 70}{100} + \frac{130 \times 60}{100} + \frac{150 \times 90}{100} + \\ &\frac{120 \times 70}{100} + \frac{80 \times 70}{100} \\ &= 54 + 28 + 78 + 135 + 84 + 56 = 435 \end{aligned}$$

$$\text{Total marks} = 60 + 40 + 130 + 150 + 120 + 80 = 580$$

$$\therefore \text{Required percentage} = \frac{435}{580} \times 100 = 75$$

EXAMPLE ▶ 5: In which subject is the overall percentage the best ?

- (a) Maths (b) Economics
(c) History (d) Science
(e) None of these

Sol. (a) It is obvious from visual observation of table.

Type 2 Data Interpretation based on Bar Graph

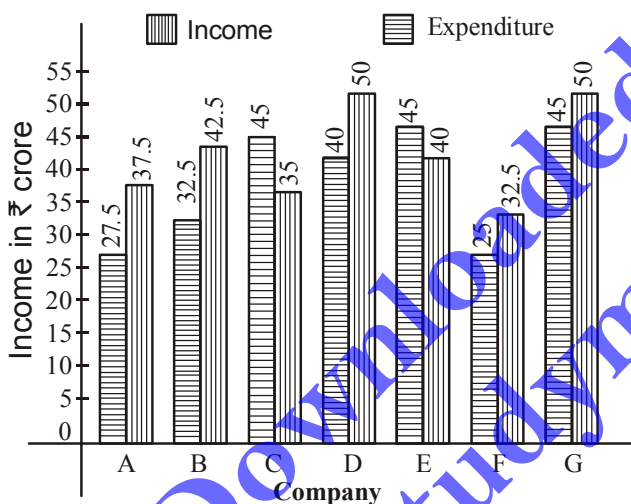
In these types of questions scale of the graph should be kept in mind.

Study the following graph to answer the given questions.

Income and Expenditure of seven companies in 2007

(in ₹ Crore)

$$\% \text{Profit / Loss} = \frac{\text{Income} - \text{Expenditure}}{\text{Expenditure}} \times 100$$



EXAMPLE ▶ 6: If the income of Company A had increased by 10% in year 2007 from year 2006 and profit earned in 2006 was 20% what was its expenditure in 2006? (The value upto two decimal places in crores)

- (a) 36.36 (b) 32.32
(c) 30.30 (d) Can't be determined
(e) None of these

Sol. (e) In year 2006 income of Company A

$$= ₹ \left(\frac{100}{110} \times 37.5 \right) \text{ crores}$$

$$= ₹ 34.09 \text{ crores}$$

Let the expenditure of Company A in 2006 = ₹ x crores

$$\therefore 20 = \frac{34.09 - x}{x} \times 100$$

$$\text{or } 0.2x = 34.09 - x$$

$$\text{or } 1.2x = 34.09$$

$$\text{or } x = \frac{34.09}{1.2} = ₹ 28.41 \text{ crores}$$

EXAMPLE ▶ 7: Which of the following Companies had the highest percentage of profit/loss in 2007?

- (a) B (b) C
(c) F (d) A
(e) None of these

Sol. (d) Percentage profit/loss in 2007

$$\text{Company B: } \frac{42.5 - 32.5}{32.5} \times 100 = 30.77\% \text{ (profit)}$$

$$\text{Company C: } \frac{35 - 45}{45} \times 100 = -22.2\% \text{ (loss)}$$

$$\text{Company F: } \frac{32.5 - 25}{25} \times 100 = 30\% \text{ (profit)}$$

$$\text{Company A: } \frac{37.5 - 27.5}{27.5} \times 100 = 36.36\% \text{ (profit)}$$

EXAMPLE ▶ 8: What is the approximate percentage of profit earned by the Companies C and D together in 2007?

- (a) 11 (b) 11.5
(c) 10.5 (d) 12
(e) No profit no loss.

Sol. (e) Income earned by the Companies C and D together in 2007 = 45 + 40 = ₹ 85 crores

Total expenditure by the Companies C and D together in 2007 = 35 + 50 = ₹ 85 crores.

Hence no profit no loss.

EXAMPLE ▶ 9: If the expenditure of Company E in 2007 was 20% more than its expenditure in the year 2006 and the Company has earned a profit of 10% in 2006. What was the income of company in 2006 in ₹ crores ?

- (a) 37.5 (b) 41.25
(c) 34.9 (d) Cannot be determined
(e) None of these

Sol. (b) Total expenditure of Company E in 2006

$$= \frac{45 \times 100}{120} = \frac{75}{2} \text{ ₹ crores} = 37.5 \text{ ₹ crores}$$

$$\text{Hence, } 10 = \frac{\text{Income} - 37.5}{37.5} \times 100$$

\therefore Income of company in 2006 = 41.25 ₹ crores

EXAMPLE ► 10: What is the approximate percentage of profit earned by the all companies together in 2007?

- (a) 11 (b) 11.5
(c) 10.5 (d) 15
(e) 12.5

Sol. (c) Required profit = total income - total expenditure

Total income of all companies together
= 37.5 + 42.5 + 35 + 50 + 40 + 32.5 + 50 = ₹ 287.5 crore
& similarly total expenditure = ₹ 260 crore
∴ total profit = ₹ (287.5 - 260) crore = ₹ 27.5 crore

$$\therefore \% \text{ profit} = \frac{27.5 \times 100}{260} = 10.5\%$$

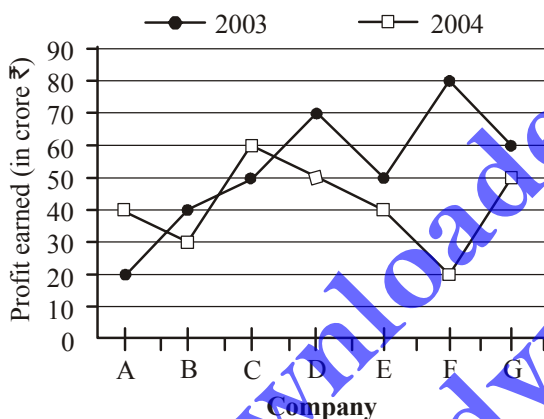
Type 3 Data Interpretation based on Line Graph

Carefully study the scale of the graph.

Study the following graph carefully to answer these questions:

Profit earned (in crore ₹) by seven companies during 2003 and 2004

Profit = Income - Expenditure



EXAMPLE ► 11: What is the ratio between the profit earned by Company A in 2004 and the profit earned by Company B in 2003 respectively?

- (a) 4:3 (b) 3:2
(c) 3:4 (d) 2:3
(e) None of these

Sol. (e) Profit earned by company A in 2004 = ₹40 crores

Profit earned by company B in 2003 = ₹40 crores

∴ Required difference = 40 : 40 = 1 : 1

EXAMPLE ► 12: What is the difference (₹ in Crore) between the total profit earned by companies E, F and G together in 2003 and the total profit earned by these companies in 2004?

- (a) 70 (b) 75
(c) 78 (d) 82
(e) None of these

Sol. (e) Profit earned by company E, F and G :

In year 2003 → 50 + 80 + 60 = ₹190 Crore

In year 2004 → 40 + 20 + 50 = ₹110 Crore

∴ Required difference = 190 - 110 = ₹80 Crore

EXAMPLE ► 13: What is the ratio between the total profit earned by company C in 2003 and 2004 together and the total profit earned by company E in these two years respectively?

- (a) 11:9 (b) 9:10
(c) 10:11 (d) 11:10
(e) None of these

Sol. (a) Profit earned by company C in 2003 and 2004

= 50 + 60 = ₹110 crore

Profit earned by company E in 2003 and 2004

= 40 + 50 = ₹ 90 crores

Required ratio = 110 : 90 = 11 : 9

EXAMPLE ► 14: What was the average profit earned by all the companies in 2003? (in ₹ crore Round-off up to two digits after decimal)

- (a) 52.75 (b) 53.86
(c) 52.86 (d) 53.75
(e) None of these

Sol. (c) Required average profit in 2003

$$₹ \left(\frac{20 + 40 + 50 + 70 + 50 + 80 + 60}{7} \right) \text{ crores}$$

$$= \frac{370}{7} = ₹ 52.86 \text{ crores}$$

EXAMPLE ► 15: Profit earned by company B in 2004 is what per cent of the profit earned by the same company in 2003?

- (a) 133.33 (b) 75
(c) 67.66 (d) 75.25
(e) None of these

Sol. (b) Profit earned by company B in 2004 = ₹30 Crore

Profit earned by company B in 2003 = ₹40 Crore

$$\text{Required \%} = \frac{30}{40} \times 100 = 75\%$$

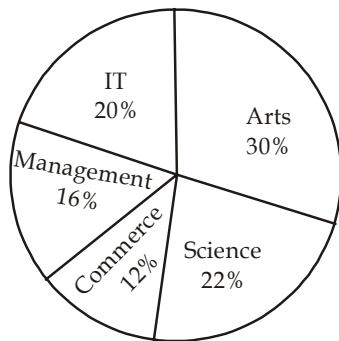
Type 4 Data Interpretation based on Pie Chart

It should be remembered that the central angle is of 360° , but if the information is given in terms of percentage then the total should be considered as 100.

Study the following Pie-charts carefully to answer the questions that follow :

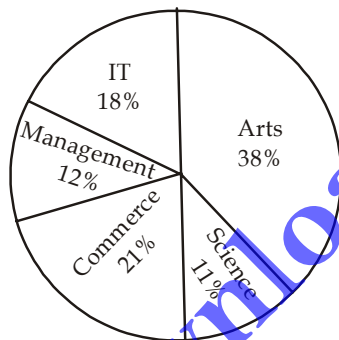
Percentage of students enrolled in different streams in a college

Total number of students = 3,500



Percentage break-up of girls enrolled in these streams out of the total students

Total number of girls = 1,500



EXAMPLE 16: What is the total number of boys enrolled in Management and IT together?

- (a) 1050 (b) 810
(c) 1120 (d) 980
(e) None of these

Sol. (b) Number of boys enrolled in Management and IT together

$$\begin{aligned} &= (16 + 20)\% \times 3500 - (12 + 18)\% \times 1500 \\ &= 3500 \times \frac{36}{100} - 1500 \times \frac{30}{100} \\ &= 1260 - 450 = 810 \end{aligned}$$

EXAMPLE 17: What is the respective ratio of number of girls enrolled in Arts to the number of boys enrolled in Science?

- (a) 14 : 23 (b) 2 : 3
(c) 114 : 121 (d) 53 : 65
(e) None of these

Sol. (c) No. of girls in Arts = $1500 \times \frac{38}{100} = 570$

No. of boys in Science

$$= 3500 \times \frac{22}{100} - 1500 \times \frac{11}{100}$$

$$= 770 - 165 = 605$$

$$\therefore \text{Ratio} = 570 : 605 = 114 : 121$$

EXAMPLE 18: What is the total number of girls enrolled in Science and Commerce together?

- (a) 450 (b) 495
(c) 345 (d) 480
(e) None of these

Sol. (d) No. of girls in Science and Commerce together

$$= 1500 \times (11 + 21)\%$$

$$= 1500 \times \frac{32}{100} = 480$$

EXAMPLE 19: If 20% of the girls enrolled in Science change their stream to Management then what will be the new number of Management students altogether?

- (a) 593 (b) 733
(c) 453 (d) 1003
(e) None of these

Sol. (a) Required number

$$= 3500 \times \frac{16}{100} + 1500 \times \frac{11}{100} \times \frac{20}{100}$$

$$= 560 + 33 = 593$$

EXAMPLE 20: Number of girls enrolled in Arts, Science and Commerce forms what percent of total number of students in the college?

- (a) 25 (b) 40
(c) 60 (d) 75
(e) None of these

Sol. (e) Number of girls in Arts, Science and Commerce together

$$= 1500 \times \frac{(38 + 11 + 21)}{100} = 1500 \times \frac{70}{100} = 1050$$

$$\therefore \text{Required \%} = \frac{1050 \times 100}{3500} = 30$$

Type 5 Data Interpretation based on Statistical Data

Read the following information carefully to answer these questions.

These statistical data were collected in the year 2005.

Hamirpur in Gujarat is a small township with a population of 75000. 40% of the population belongs to the above 35 age category. The ratio of males to females is 1:1.5. Past records indicate that the population in Hamirpur grows at an annual rate of 7%. The total cultivable area in Hamirpur is 2 lakh acres. Paddy is the major crop of Hamirpur and has shown average productivity levels of 2.5 tonnes per acre. Hamirpur receives about 10 inches of rainfall in a normal monsoon year.

EXAMPLE 21: The number of people in Hamirpur below the age of 35 is

- (a) 41000 (b) 42000
(c) 45000 (d) 43000
(e) 44000

Sol. (c) Population of Hamirpur = 75000
Population below the age of 35

$$= \frac{60}{100} \times 75000 = 45000$$

EXAMPLE 22: The number of males in Hamirpur is greater/lesser than the number of females by

- (a) Lesser by 15000 (b) Greater by 15000
(c) Lesser by 10000 (d) Greater by 10000
(e) None of these

Sol. (a) Males : Females = 1 : 1.5

$$\therefore 1 \times x + 1.5x = 75000$$

$$\text{or, } 2.5x = 75000$$

$$\therefore x = \frac{75000}{2.5} = 30000$$

$$\therefore \text{Number of males} = 30000$$

$$\text{Number of females} = 1.5 \times 30000 = 45000$$

$$\therefore \text{Difference} = 45000 - 30000 = 15000$$

EXAMPLE 23: If the ratio of males to females in 2006 remains the same as that was in 2005, then the number of males in 2006 would be

- (a) 30600 (b) 32100
(c) 31500 (d) 32700
(e) 33000

Sol. (b) Population of Hamirpur in 2006 = $1.07 \times 75000 = 80250$
(\because annual population growth rate is 7%)

$$\frac{\text{Male}}{\text{Female}} = \frac{1}{1.5}$$

$$\therefore 2.5x = 80250$$

$$\therefore x = \frac{80250}{2.5} = 32100$$

$$\therefore \text{Number of males in 2006} = 32100$$

EXAMPLE 24: What would be the approximate population of Hamirpur in 2007?

- (a) 85000 (b) 84750
(c) 83900 (d) 85870
(e) 86850

Sol. (d) From above question,

$$\text{Population of city in 2006} = 80250$$

$$\text{Population growth rate} = 7\%$$

$$\therefore = 1.07 \times 80250 = 85868 \approx 85870$$

EXAMPLE 25: If in 2005, only 60% of the average productivity were attained, then the total paddy production in Hamirpur would be

- (a) 2.6 lakh tonnes (b) 3.0 lakh tonnes
(c) 2.8 lakh tonnes (d) 3.3 lakh tonnes
(e) 3.6 lakh tonnes

Sol. (b) Productivity = $\frac{\text{Paddy production (in tonnes)}}{\text{Total cultivable area}}$

$$\text{Average productivity of Hamirpur}$$

$$= 2.5 \text{ tonnes per acre}$$

$$60\% \text{ of productivity} = 0.6 \times 2.5 = 1.50 \text{ tonnes per acre}$$

$$\text{Total paddy production}$$

$$= 1.5 \text{ tonnes per acres} \times 2 \text{ lakh acres}$$

$$= 3 \text{ lakh tonnes}$$

EXERCISE

DIRECTION (Q.1-5) : Study the following table carefully to answer the questions that follow:

Number of boys and girls in five streams of a college over the years 2002-2007 :

STREAMS										
Year	Arts		Science		Commerce		Management		IT	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
2002	556	414	619	505	668	612	770	633	670	515
2003	763	608	793	612	781	616	667	439	866	722
2004	672	519	540	516	859	713	778	727	781	619
2005	809	602	928	908	870	811	849	729	977	817
2006	745	510	884	820	967	819	562	938	990	808
2007	698	413	765	616	571	515	1288	1016	1151	1010

- What is the total number of boys, in all the streams together, in the year 2004?
 - 4148
 - 3630
 - 4433
 - 3247
 - None of these
- The number of boys in Arts stream in the year 2004 is approximately what per cent of the total number of boys for all the years together in Arts stream?
 - 27
 - 34
 - 08
 - 39
 - 16
- What is the ratio of the total number of boys to the total number of girls, in all the streams together, for the year 2007?
 - 2:3
 - 14:13
 - 52:49
 - 213:170
 - None of these
- What is the ratio of the number of boys to the total number of girls, in the Management stream for all the years together?
 - 9:8
 - 71:86
 - 91:83
 - 27:23
 - None of these
- What is the average number of Girls in Commerce stream in all the given years?
 - 681
 - 675
 - 618
 - 657
 - None of these

State	2005			2006		
	M	F	T	M	F	T
A	12	15	32	7	8	35
B	8	7	18	10	9	20
C	9	10	28	10	12	34
D	10	6	24	8	8	30
E	6	8	30	7	6	32
F	7	5	28	8	7	35

M = Percentage of unemployed Male youth over total population

F = Percentage of unemployed Female youth over total population

T = Total population of the state in lakhs

- What was the difference between the number of unemployed male youths of State F in 2005 to the number of unemployed male youths of State A in 2006?
 - 70,000
 - 45,000
 - 68,000
 - 65,000
 - None of these
- What was the respective ratio between unemployed male youths of State D in 2005 to the unemployed male youths of State D in 2006?
 - 1:1
 - 2:3
 - 3:2
 - 4:5
 - None of these
- What was the total number of unemployed youths in State A in 2006?
 - 2,20,000
 - 3,25,000
 - 5,20,000
 - 525,000
 - None of these
- How many female youths were unemployed in State D in 2005?
 - 14,400
 - 1,44,000
 - 1,40,000
 - 14,000
 - None of these

DIRECTION (Q.6-10) : Study the following table carefully to answer these questions:

Table showing percentage of unemployed male and female youth and the total population of different states in 2005 and 2006.

10. Number of unemployed male youths of State A in 2005 was what per cent of the number of unemployed female youths of State E in 2006?
- (a) 66 (b) 50
(c) 200 (d) 133
(e) None of these
15. In which discipline was there a continuous increase in the number of students over the given years?
- (a) Science (b) Agriculture
(c) Arts (d) Commerce
(e) Management

DIRECTIONS (11 - 15) : Study the following table carefully and answer the questions given below:

Number of students in five disciplines of a college over the years

Discipline Year	Arts	Sci.	Com.	Manag.	Agri.
2001	240	358	275	215	314
2002	260	390	286	234	365
2003	275	374	265	269	336
2004	284	368	290	255	348
2005	296	415	272	284	326
2006	312	432	364	276	383

11. In which year was the percentage change in case of the Agriculture discipline highest compared to the previous year?
- (a) 2002 (b) 2003
(c) 2004 (d) 2005
(e) 2006
12. How much **approximate** percentage increase was there in the number of students of Commerce discipline from 2003 to 2004?
- (a) 14 (b) 18
(c) 20 (d) 9
(e) 22
13. In which year was the difference in number of students of Arts and Science exactly 130?
- (a) 2001 (b) 2002
(c) 2004 (d) 2006
(e) None of these
14. The total number of students in Agriculture in 2001 and 2005 together was **approximately** what percent of the number of students of the same discipline in 2002?
- (a) 75 (b) 165
(c) 65 (d) 175
(e) 190
16. If, to pass in the exam, a minimum of 54 marks in English and minimum 93 marks in Science are required, how many students have passed the exam?
- (a) One (b) Four
(c) Two (d) Three
(e) None of these
17. Which student has scored the highest marks in all the subjects altogether?
- (a) F (b) E
(c) B (d) C
(e) None of these
18. What are the average marks obtained by all students together in Hindi?
- (a) 35.02 (b) 32.68
(c) 31.33 (d) 30.83
(e) None of these
19. What is the overall percentage of marks obtained by F in all subjects together?
- (a) 74 (b) 72
(c) 75 (d) 78
(e) None of these
20. What are the total marks obtained by B in Maths and Social Studies together?
- (a) 153 (b) 159
(c) 146 (d) 149
(e) None of these

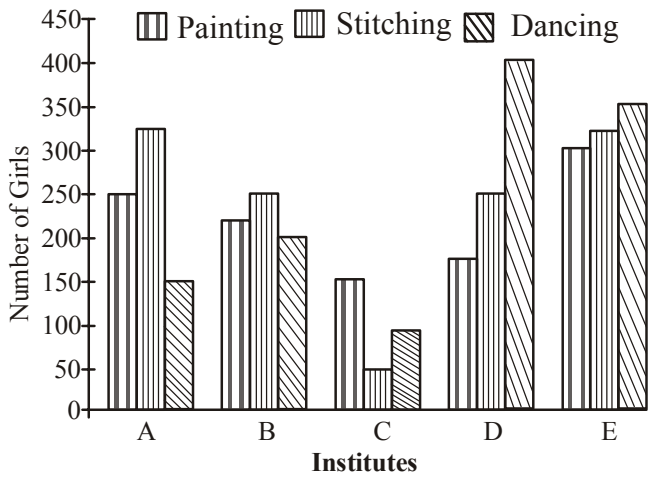
DIRECTIONS (16-20) : Study the table carefully to answer the questions that follow:

PERCENTAGE OF MARKS OBTAINED BY SIX STUDENTS IN SIX DIFFERENT SUBJECTS

Subject	Maths	English	Science	Hindi	Social Studies	Marathi
Student	(out of 150)	(out of 75)	(out of 125)	(out of 50)	(out of 100)	(out of 25)
A	74	68	62	68	81	74
B	64	72	82	68	63	66
C	72	84	78	66	77	70
D	78	82	64	70	69	84
E	82	64	84	72	65	60
F	68	72	74	74	83	80

DIRECTION (Q. 21 - 25) : Study the graph carefully to answer the questions that follow.

Number of girls enrolled in different hobby classes in various institutes in a year.

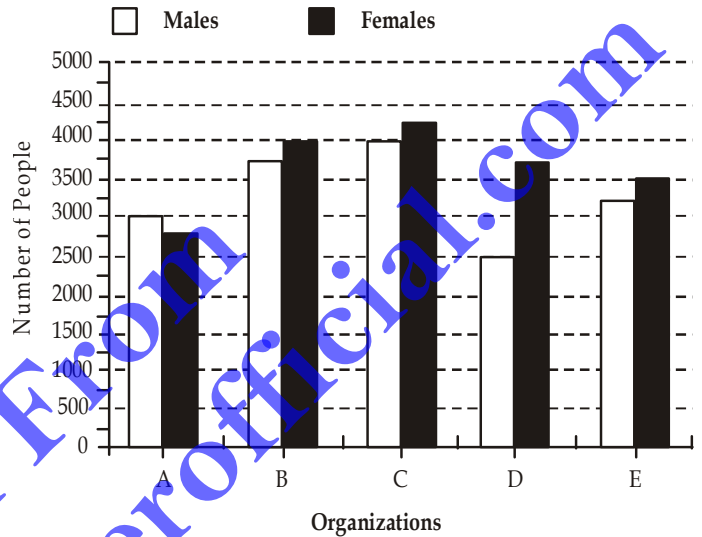


21. What is the respective ratio of total number of girls enrolled in Painting in the Institutes A and C together to those enrolled in stitching in the Institute D and E together?
 - (a) 5 : 4
 - (b) 5 : 7
 - (c) 16 : 23
 - (d) 9 : 8
 - (e) None of these
22. Number of girls enrolled in stitching in Institute B forms approximately how much per cent of the total number of girls enrolled in stitching in all the institutes together?
 - (a) 29
 - (b) 21
 - (c) 33
 - (d) 37
 - (e) 45
23. What is the respective ratio of total number of girls enrolled in Painting, Stitching and Dancing of all the institutes together?
 - (a) 44 : 48 : 47
 - (b) 43 : 47 : 48
 - (c) 44 : 47 : 48
 - (d) 47 : 48 : 44
 - (e) None of these
24. Number of girls enrolled in dancing in institute A forms how much per cent of total number of girls enrolled in all the Hobby classes together in that Institute? (round off to two digits after decimal)
 - (a) 23.87
 - (b) 17.76
 - (c) 31.23
 - (d) 33.97
 - (e) 20.69
25. What is the total number of girls enrolled in Painting in all the Institutes together?

- (a) 1150
- (b) 1200
- (c) 1275
- (d) 1100
- (e) None of these

DIRECTIONS (26 - 30) : Study the following graph carefully to answer the questions that follow.

Total number of males and females in five different organizations



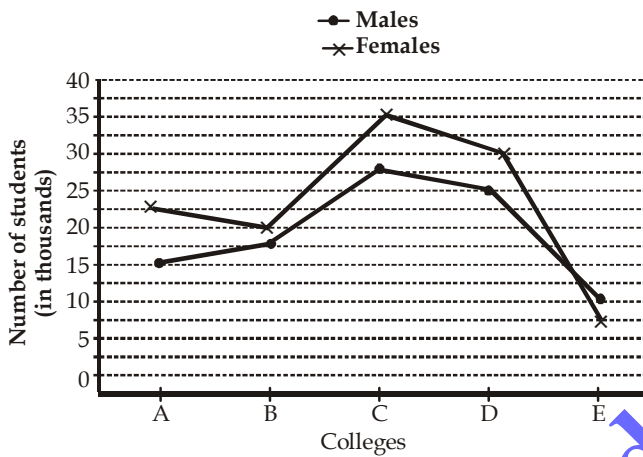
26. What is the average number of females in all the Organizations together?
 - (a) 3800
 - (b) 3550
 - (c) 3300
 - (d) 3150
 - (e) None of these
27. The number of males of Organization A is **approximately** what percent of the total number of males in all the Organizations together?
 - (a) 18
 - (b) 28
 - (c) 11
 - (d) 31
 - (e) 36
28. What is the difference between the total number of females and the total number of males in all the Organizations together?
 - (a) 1500
 - (b) 1750
 - (c) 1800
 - (d) 2050
 - (e) None of these
29. What is the respective ratio of number of females in Organization C to the number of females in Organization E?
 - (a) 14 : 17
 - (b) 17 : 14
 - (c) 14 : 15
 - (d) 15 : 14
 - (e) None of these

30. The total number of males in Organizations A & B together are **approximately** how much percent of the total number of males in Organizations C, D and E together?
- (a) 58 (b) 75
(c) 69 (d) 83
(e) 52

35. The number of Males passing out from colleges A and B together is how much percent of the number of females passing out from colleges C and D together?
- (a) 45 (b) 40
(c) 35 (d) 50
(e) None of these

DIRECTIONS (31-35) : Study the following graph carefully and answer the questions below that follow.

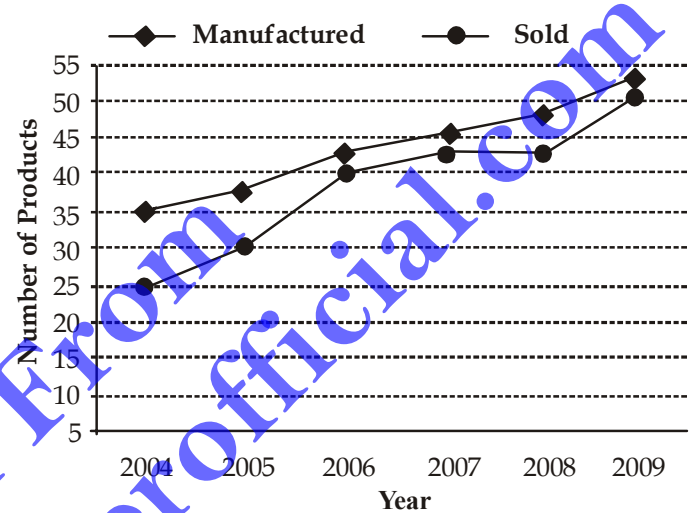
Number of students (males & females) passed out from various colleges in a year.



31. What is the average number of students per college (Males & Females) who passed out from all the colleges together?
- (a) 38000 (b) 48000
(c) 42000 (d) 51000
(e) None of these
32. The number of Females passed out from college C is **approximately** what percent of the total number of Females passed out from all the colleges together?
- (a) 28 (b) 30
(c) 36 (d) 25
(e) 40
33. What is the difference between the total number of students passing out from college A and the total number of students passing out from college E?
- (a) 20,500 (b) 21,000
(c) 10,500 (d) 10,000
(e) None of these
34. What is the respective ratio of the total number of Males to the total number of Females passed out from all the colleges together?
- (a) 19:23 (b) 18:25
(c) 23:19 (d) 25:18
(e) None of these

DIRECTIONS (36-40) : Study the following graph carefully to answer the questions:

Number (In thousands) of products manufactured and sold by a company over the years

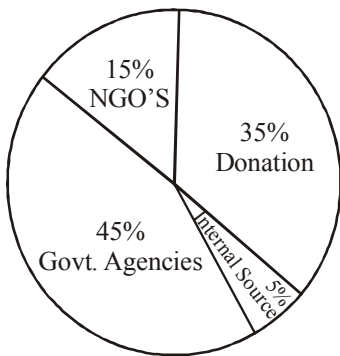


36. What is the difference in the number of products manufactured by the company in the year 2009 and 2008?
- (a) 4000 (b) 5500
(c) 3500 (d) 4500
(e) None of these
37. The number of products sold by the company in the year 2004 is what percent of the number of products manufactured by it in that year? (rounded off to two digits after decimal)
- (a) 71.43 (b) 67.51
(c) 81.67 (d) 56.29
(e) None of these
38. What is the percent increase in the number of products sold by the company in the year 2006 from the previous year? (round off to two digits after decimal)
- (a) 19.25 (b) 33.33
(c) 10.45 (d) 42.66
(e) None of these
39. What is the respective ratio of the number of products not sold by the company in the year 2007 to those not sold in the year 2005?
- (a) 3 : 1 (b) 6 : 5
(c) 1 : 3 (d) 5 : 6
(e) None of these

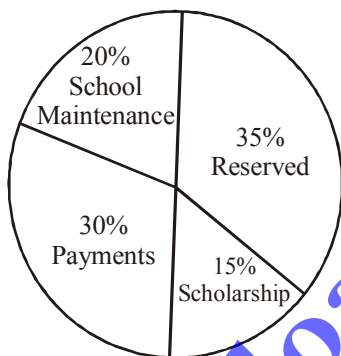
40. What is the **approximate** average number of products manufactured by the company over all the years together?
- (a) 36550 (b) 39480
(c) 41220 (d) 43330
(e) 34420

DIRECTIONS (41-45) : Study the following pie-charts carefully and answer the questions given below them.

The entire fund that a school gets from different sources is equal to ₹ 500 lakhs.



Sources of Funds acquired by the School



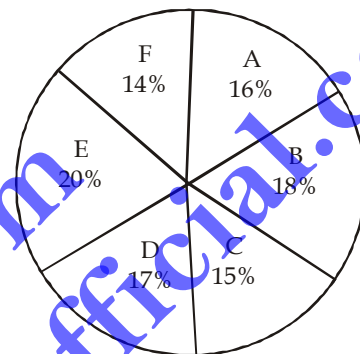
Uses of Funds by the school

41. What is the difference between the funds acquired by school from NGO's and internal sources?
- (a) ₹ 50 lakhs (b) ₹ 45 lakhs
(c) ₹ 75 lakhs (d) ₹ 25 lakhs
(e) None of these
42. If the school managed 'school maintenance' from the 'government agencies' fund only, then how much fund from government agencies would still be left for other use?
- (a) ₹ 120 lakhs (b) ₹ 150 lakhs
(c) ₹ 110 lakhs (d) ₹ 95 lakhs
(e) None of these
43. If scholarship has to be paid out of the donation fund, then what is the **approximate** percent of donation fund used for this purpose?
- (a) 43% (b) 53%
(c) 37% (d) 47%
(e) 32%
44. What is the total amount used by the school for payment?
- (a) ₹ 100 lakhs (b) ₹ 110 lakhs

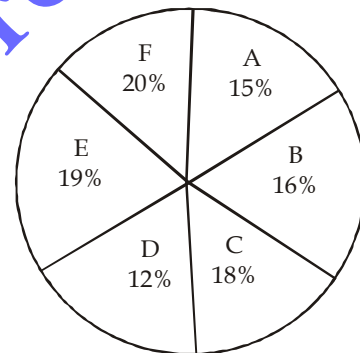
- (c) ₹ 150 lakhs (d) ₹ 140 lakhs
(e) None of these
45. What amount of the fund is acquired by the school from government agencies?
- (a) ₹ 220 lakhs (b) ₹ 310 lakhs
(c) ₹ 255 lakhs (d) ₹ 225 lakhs
(e) None of these

DIRECTIONS (46-55) : Study the following pie-charts carefully and answer the questions given below them.

Graduate and class XII passed population details from different states of a country
Total graduate passed population = 24 lakh



Total class XII passed population = 32 lakh



Male - Female ratio

State	Graduate			XIIth pass		
	M	:	F	M	:	F
A	7		5	7		9
B	5		3	3		5
C	5		4	4		5
D	9		8	5		7
E	9		7	9		10
F	4		3	3		2

46. What is the difference between graduate male population and XIIth passed male population of state A?
- (a) 24,000 (b) 14,000
(c) 28,000 (d) 36,000
(e) None of these
47. What is the ratio of graduate female population of state E to XIIth passed female population of state D?
- (a) 7 : 5 (b) 5 : 7
(c) 16 : 15 (d) 15 : 16
(e) None of these
48. Total graduate female population of state C is what per cent of the the total XIIth passed female population of that state?
- (a) 40 (b) 62.5
(c) 50 (d) 52.5
(e) None of these
49. Total XIIth passed male population from state C is what per cent of the total XIIth passed population from all states together ?
- (a) 8% (b) 12%
(c) 11% (d) 9%
(e) None of these
50. What is the ratio of total graduate male population of state E to total XIIth passed female population of that state ?
- (a) 28 : 35 (b) 35 : 28
(c) 32 : 45 (d) 45 : 32
(e) None of these
51. Total graduate population of state F is what per cent of the total XIIth passed population of state A ?
- (a) 56 (b) 72
(c) 68 (d) 76
(e) None of these
52. Total XIIth passed population of state E is what per cent of the the total XIIth passed male population of state F ?
- (a) 70 (b) 75
(c) 68 (d) 72
(e) None of these
53. What is the ratio of total graduate and total XIIth passed male population of state A to the total graduate and XIIth passed female population of the same state?
- (a) 215 : 216 (b) 214 : 215
(c) 217 : 215 (d) 215 : 217
(e) None of these
54. What is the ratio of total graduate population of state D to total XIIth passed population of the same state ?
- (a) 17 : 16 (b) 16 : 17
(c) 64 : 51 (d) 51 : 64
(e) None of these
55. Total graduate female population of state B is what per cent of the Total graduate female population of state E ?
- (a) 129 (b) 82
(c) 77 (d) 107
(e) None of these
- DIRECTION (Q. 56 - 60) : Study the following information carefully to answer the following questions :**
- In an organization consisting of 750 employees, the ratio of Males to Females is 8 : 7 respectively. All the employees work in five different departments viz. HR, Management, PR, IT and Recruitment. 16 per cent of the females work in management department. 32 per cent of males are in HR department. One-fifth of the females are in the department of Recruitment.. The ratio of males to females in the Management Department is 3:2 respectively. 20 per cent of the total numbers of employees are in PR Department. Females working in recruitment are 50 percent of the males working in the same Department. 8 per cent of the males are in the IT Department. The remaining Males are in PR Department. 22 per cent of the females are working in HR Department and remaining are working in the IT Department.**
56. What is the total number of females working in the IT and recruitment department together?
- (a) 147 (b) 83
(c) 126 (d) 45
(e) None of these
57. What is the number of females working in the HR Department?
- (a) 77 (b) 70
(c) 56 (d) 134
(e) None of these
58. Number of males working in HR Department forms approximately what per cent of total number of the employees in the organization?
- (a) 20 (b) 28
(c) 32 (d) 9
(e) 17
59. Number of males working in PR Department forms what per cent of the number of Females working in the same department? (round off to two digits after decimal)
- (a) 22.98 (b) 16.68
(c) 11.94 (d) 6.79
(e) 27.86

60. What is the total number of employees working in the Management department?
- (a) 128 (b) 77
(c) 210 (d) 140
(e) None of these
61. Total how many officers take training in HRM?
- (a) 110 (b) 128
(c) 118 (d) 98
(e) None of these
62. Total how many clerks take training in Computer Skills but not in HRM?
- (a) 113 (b) 104
(c) 88 (d) 79
(e) None of these

DIRECTIONS (61-65) : Study the following information carefully to answer these questions.

An Institute having 450 employees has sent all its employees for training in one or more areas related to HRM, Computer Skills and Financial Skills. Employees are classified into two categories officers and clerks, which are in the ratio of 4:5 respectively. 10% of the officers take training only in Computer Skills, 16% of the clerks take training only in HRM which is equal to the number of officers taking training only in Financial Skills and 50% of the number of officers taking training in HRM and financial Skills both. 6% of the total employees take training in all three of which two-third are officers. 10% of the total employees take training in HRM and Computer Skills both, which is five times the number of clerks taking training in Computer Skills and Financial Skills. 10% of the clerks take training in HRM and Computer Skills both. Number of officers taking training only in HRM is 25% of the number of clerks taking training only in HRM. 20% of the total number of employees take training only in Computer Skills. Number of clerks taking training in HRM and Financial skills both is 20% of the total number of clerks.

63. Total how many employees take training in Financial Skills but not in HRM?
- (a) 106 (b) 135
(c) 127 (d) 134
(5) None of these
64. Total how many clerks take training in Financial Skills?
- (a) 115 (b) 106
(c) 47 (d) 97
(5) None of these
65. What percent of the total number of officers take training in Computer Skills but not in Financial Skills?
- (a) 25 (b) 40
(c) 20 (d) 15
(5) None of these

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Answer Key

1	(b)	14	(d)	27	(a)	40	(d)	53	(c)
2	(e)	15	(c)	28	(b)	41	(a)	54	(a)
3	(d)	16	(c)	29	(b)	42	(e)	55	(c)
4	(c)	17	(d)	30	(c)	43	(a)	56	(b)
5	(a)	18	(e)	31	(c)	44	(c)	57	(a)
6	(e)	19	(a)	32	(b)	45	(d)	58	(e)
7	(a)	20	(b)	33	(e)	46	(b)	59	(c)
8	(d)	21	(c)	34	(a)	47	(d)	60	(d)
9	(b)	22	(b)	35	(d)	48	(c)	61	(b)
10	(c)	23	(a)	36	(e)	49	(a)	62	(d)
11	(e)	24	(e)	37	(a)	50	(e)	63	(e)
12	(d)	25	(d)	38	(b)	51	(e)	64	(a)
13	(b)	26	(e)	39	(c)	52	(b)	65	(c)

ANSWERS & EXPLANATIONS

1. (b) Total number of boys, for all streams together in 2004
 $= 672 + 540 + 859 + 778 + 781 = 3630$
2. (e) Number of boys in Arts stream for all the years
 $= 556 + 763 + 672 + 809 + 745 + 698 = 4243$
 Number of boys in Arts stream in 2004 = 672
 \therefore Required percentage = $\frac{672}{4243} \times 100 \approx 16$
3. (d) Number of boys in all streams together in 2007
 $= 698 + 765 + 571 + 1288 + 1151 = 4473$
 Number of girls from all streams together in 2007
 $= 413 + 616 + 515 + 1016 + 1010 = 3570$
 \therefore Required ratio = $4473 : 3570 = 213 : 170$
4. (c) Total number of boys in Management stream
 $= 770 + 667 + 778 + 849 + 562 + 1288 = 4914$
 Total number of girls in Management stream
 $= 633 + 439 + 727 + 729 + 938 + 1016 = 4482$
 \therefore Required ratio = $4914 : 4482 = 91 : 83$
5. (a) Average number of girls in Commerce stream

$$\frac{612 + 616 + 713 + 811 + 819 + 515}{6}$$

$$= \frac{4086}{6} = 681$$
6. (e) Number of unemployed male youth in 2005 in state F
 $= \frac{7 \times 28}{100} = 1.96$ lakh
 Number of unemployed male youth in 2006 in state A
 $= \frac{7 \times 35}{100} = 2.45$ lakh
 \therefore Required difference = $(2.45 - 1.96)$ lakh
 $= 0.49$ lakh = 49000
7. (a) Number of unemployed male youth in 2005 in state D
 $= \frac{10 \times 24}{100} = 2.4$ lakh
 Number of unemployed male youth in 2006 in state D

$$= \frac{8 \times 30}{100} = 2.4 \text{ lakh}$$

$$\therefore \text{Required ratio} = 2.4 : 2.4 = 1 : 1$$

8. (d) Required number

= Number of unemployed persons in 2006 in state A

= (7% + 8%) of 35 lakh

$$= 3500000 \times \frac{15}{100} = 525000$$

9. (b) Number of unemployed females in 2005 in state D

= 6% of 24 lakh

$$= 2400000 \times \frac{6}{100}$$

= 144000

10. (c) Number of unemployed males in 2005 in state A

$$= \frac{12 \times 32}{100} = 3.84 \text{ lakh}$$

Number of unemployed females in 2006 in state F

$$= \frac{6 \times 32}{100} = 1.92 \text{ lakh}$$

$$\therefore \text{Required \%} = \frac{3.84}{1.92} \times 100 = 200$$

11. (e) The percentage change in Agriculture was the highest compared to the previous year in 2006.

$$\text{i.e. } \frac{383 - 326}{326} \times 100 = 17.48\%$$

12. (d) Required %

$$= \frac{290 - 265}{265} \times 100$$

= 9 (approx.)

13. (b) The difference in number of students in Arts and Science was exactly 130 in 2002.

14. (d) Required %

$$= \frac{314 + 326}{365} \times 100$$

= 175 (approx.)

15. (c) In Arts discipline there was a continuous increase in the number of students over the given years.

16. (c) Percentage pass marks in English

$$= \frac{54}{75} \times 100 = 72\%$$

Percentage pass marks in Science

$$= \frac{93}{125} \times 100 = 74.4\%$$

So, only B and C passed in the exam.

17. (d) Marks in all subjects together for :

$$A = 111 + 51 + 77.5 + 34 + 81 + 18.5 = 373$$

$$B = 96 + 54 + 102.5 + 34 + 63 + 16.5 = 366$$

$$C = 108 + 63 + 97.5 + 33 + 77 + 17.5 = 396$$

$$D = 117 + 61.5 + 80 + 35 + 69 + 21 = 383.5$$

$$E = 123 + 48 + 105 + 36 + 65 + 15 = 392$$

$$F = 102 + 54 + 92.5 + 37 + 83 + 20 = 388.5$$

Hence C scored the highest marks in all subjects together.

18. (e) Required average

$$= (34 + 34 + 33 + 35 + 36 + 37) \div 6$$

$$= 209 \div 6 = 34.83$$

19. (a) Marks obtained by F in all subjects

$$= 388.5$$

Total maximum marks

$$= 150 + 75 + 125 + 50 + 100 + 25 = 525$$

$$\therefore \text{Required \%} = \frac{388.5 \times 100}{525} = 74$$

20. (b) Marks obtained by B in Maths and Social Studies together

$$= 150 \times \frac{64}{100} + 100 \times \frac{63}{100}$$

$$= 96 + 63 = 159$$

21. (c) Total number of girls enrolled in painting in the institutes A and C together = 250 + 150 = 400

Total number of girls enrolled in stitching in the institutes D and E together = 250 + 325 = 575

$$\therefore \text{Required ratio} = 400 : 575 = 16 : 23$$

22. (b) Total number of girls enrolled institching in all the institutes
 $= 325 + 250 + 50 + 250 + 325 = 1200$
 Number of girls enrolled institching in institute
 $B = 250$
 \therefore Required percentage
 $= \frac{250}{1200} \times 100 \approx 21$
23. (a) Number of girls from all the institutes enrolled in Painting :
 $250 + 225 + 150 + 175 + 300 = 1100$
 Stitching : 1200 (from previous question)
 Dancing : $150 + 200 + 75 + 400 + 350 = 1175$
 \therefore Required ratio = $1100 : 1200 : 1175$
 $= 44 : 48 : 47$
24. (e) Total number of girls in the institute A
 $= 250 + 325 + 150 = 725$
 Number of girls enrolled in dancing in the institute
 $A = 150$
 \therefore Required percentage = $\frac{150}{725} \times 100 \approx 20.69$
25. (d) Total number of girls in painting = 1100 (from Q. 23)
26. (e) Average number of females
 $= (2750 + 4000 + 4250 + 3750 + 3500) \div 5$
 $= 18250 \div 5$
 $= 3650$
27. (a) Total number of males
 $= 3000 + 3750 + 4000 + 2500 + 3250 = 16500$
 \therefore Required percentage
 $= \frac{3000 \times 100}{16500}$
 $= 18$ (approx.)
28. (b) Required difference
 $= 18250 - 16500 = 1750$
29. (b) Required ratio = $4250 : 3500 = 17 : 14$
30. (c) Required percentage
 $= \frac{(3000 + 3750) \times 100}{(4000 + 2500 + 3250)}$
 $= \frac{6750 \times 100}{9750}$
 $= 69$ (approx.)
31. (c) Required average
 $= (15000 + 22500 + 17500 + 20000 + 27500 + 35000 + 25000 + 30000 + 10000 + 7500) \div 5$
 $= 210000 \div 5 = 42000$
32. (b) Total number of females passed out from all the colleges
 $= 22500 + 20000 + 35000 + 30000 + 7500 = 115000$
 \therefore Required %
 $= \frac{35000 \times 100}{115000}$
 $= 30$ (approx.)
33. (e) Required difference
 $= (15000 + 22500) - (10000 + 7500)$
 $= 37500 - 17500 = 20000$
34. (a) Required ratio
 $= 95000 : 115000$
 $= 19 : 23$
35. (d) Required %
 $= \frac{(15000 + 17500) \times 100}{(35000 + 30000)}$
 $= 50$
36. (e) Required difference = $52500 - 47500 = 5000$
37. (a) Required % = $\frac{25000 \times 100}{35000} = 71.43$
38. (b) %age growth = $\frac{(40 - 30)}{30} \times 100$
 $= \frac{10}{30} \times 100 = 33.33$
39. (c) Required ratio = $(45 - 42.5) : (37.5 - 30)$
 $= 2.5 : 7.5 = 1 : 3$

40. (d) average $= 210000$
 $= [(35 + 37.5 + 42.5 + 45 + 47.5 + 52.5) \times 1000] \div 6$
 $= \frac{260000}{6} = 43330$
41. (a) Required difference $= 500 \times (15 - 5)\%$
 $= 500 \times \frac{10}{100}$
 $= ₹ 50 \text{ lakh}$
42. (e) Required total $= 500 \times (45 - 20)\%$
 $= 500 \times \frac{25}{100}$
 $= ₹ 125 \text{ lakh}$
43. (a) Required % $= \frac{15}{35} \times 100$
 $= 43 \text{ (approx.)}$
44. (c) Required amount $= 500 \times \frac{30}{100}$
 $= ₹ 150 \text{ lakh}$
45. (d) Required amount $= 500 \times \frac{45}{100}$
 $= ₹ 225 \text{ lakh}$
46. (b) Male graduate population in state A $= 2400000 \times \frac{16}{100} \times \frac{7}{12}$
 $= 224000$
 Male class XII population in State A $= 3200000 \times \frac{15}{100} \times \frac{7}{16}$
 $= 210000$
 \therefore difference $= 224000 - 210000$
 $= 14000$
47. (d) Female graduate population in State E $= 2400000 \times \frac{20}{100} \times \frac{7}{16}$
- Female class XII population in State D $= 3200000 \times \frac{12}{100} \times \frac{7}{12}$
 $= 224000$
 \therefore Required ratio $= 210000 : 224000$
 $= 15 : 16$
48. (c) Required % $= \frac{15 \times 24 \times 4}{18 \times 32 \times 5} \times 100 = 50$
49. (a) Required % $= \frac{32 \times \frac{18}{100} \times \frac{4}{9}}{32} \times 100$
 $= \frac{32 \times 18 \times 4 \times 100}{32 \times 100 \times 9} = 8$
50. (e) Required ratio $= \frac{20 \times 24 \times 9}{100 \times 16} : \frac{19 \times 32 \times 10}{100 \times 9}$
 $= 270 : 320 = 27 : 20$
51. (e) Required % $= \frac{14 \times 24 \times 100}{15 \times 32} = 70$
52. (b) Required % $= \frac{32 \times 9 \times 100}{4 \times 32 \times 3} = 75$
53. (c) Total Male population of Class XII and graduate in State A $= 24 \times \frac{16}{100} \times \frac{7}{12} + 32 \times \frac{15}{100} \times \frac{7}{16}$
 $2.24 + 2.1 = 4.34$
 Total female population of Class XII and graduate in State A $= 24 \times \frac{16}{100} \times \frac{5}{12} + 32 \times \frac{15}{100} \times \frac{9}{16}$
 $= 1.6 + 2.7 = 4.3$
 \therefore Required ratio $= 4.34 : 4.3 = 217 : 215$

54. (a) Required ratio

$$= \left(24 \times \frac{17}{100} \right) : \left(32 \times \frac{12}{100} \right)$$

$$= 24 \times 17 : 32 \times 12 = 17 : 16$$

55. (c) Required %

$$= \frac{24 \times \frac{18}{100} \times \frac{3}{8}}{24 \times \frac{20}{100} \times \frac{7}{16}} \times 100$$

$$= \frac{18 \times 3}{8} \times \frac{16}{20 \times 7} \times 100$$

$$= 77 \text{ (approx.)}$$

For Qs 56-60

Total number of employees in the organisation = 750

Male : Female = 8 : 7

$$\text{Number of males} = \frac{8}{15} \times 750 = 400$$

Number of females = 750 - 400 = 350

Number of females in management department

$$= \frac{350 \times 16}{100} = 56$$

Number of males in management department

$$= \frac{3}{2} \times 56 = 84$$

Number of males in HR department

$$= \frac{32 \times 400}{100} = 128$$

Number of females in recruitment department

$$= 350 \times \frac{1}{5} = 70$$

Number of males in this department

$$= 2 \times 70 = 140$$

Number of males in IT department

$$= \frac{8 \times 400}{100} = 32$$

Number of females in HR department

$$= 350 \times \frac{22}{100} = 77$$

Number of employees in PR department

$$= 20 \times \frac{750}{100} = 150$$

Number of males

$$= 400 - (84 + 128 + 140 + 32)$$

$$= 400 - 384 = 16$$

∴ Number of females = 150 - 16 = 134

Number of females in IT department

$$= 350 - (56 + 70 + 77 + 134)$$

$$= 350 - 337 = 13$$

56. (b) Number of females = 13 + 70 = 83

57. (a) Number of females in HR department = 77

58. (e) Number of males in HR department = 128

$$\text{Required percentage} = \frac{128}{750} \times 100 \approx 17$$

59. (c) Required percentage = $\frac{16}{134} \times 100 \approx 11.94$

60. (d) Total number of employees in Management department

$$= 56 + 84 = 140$$

For Qs 61 - 65 :

Category Areas	Officers (200)	Clerks (250)	Total (450)
HRM	10	40	50
Computer Skills	20	70	90
Financial Skills	40	47	87
HRM + Financial Skills	80	50	130
HRM + Computer Skills	20	25	45
Computer Skills + Financial Skills	12	9	21
All three	18	9	27

61. (b) Number of officers taking training in HRM

$$= 10 + 80 + 20 + 18$$

$$= 128$$

62. (d) Number of clerks taking training in computer skills but not in HRM

$$= 70 + 9$$

$$= 79$$

63. (e) Number of employees taking training in Financial skills but not in HRM = $87 + 21 = 108$

64. (a) Number of clerks taking training in Financial Skills

$$= 47 + 50 + 9 + 9 = 115$$

65. (c) Required percentage

$$= \frac{(20 + 20)}{200} \times 100 = 20\%$$

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DATA SUFFICIENCY

CHAPTER 14

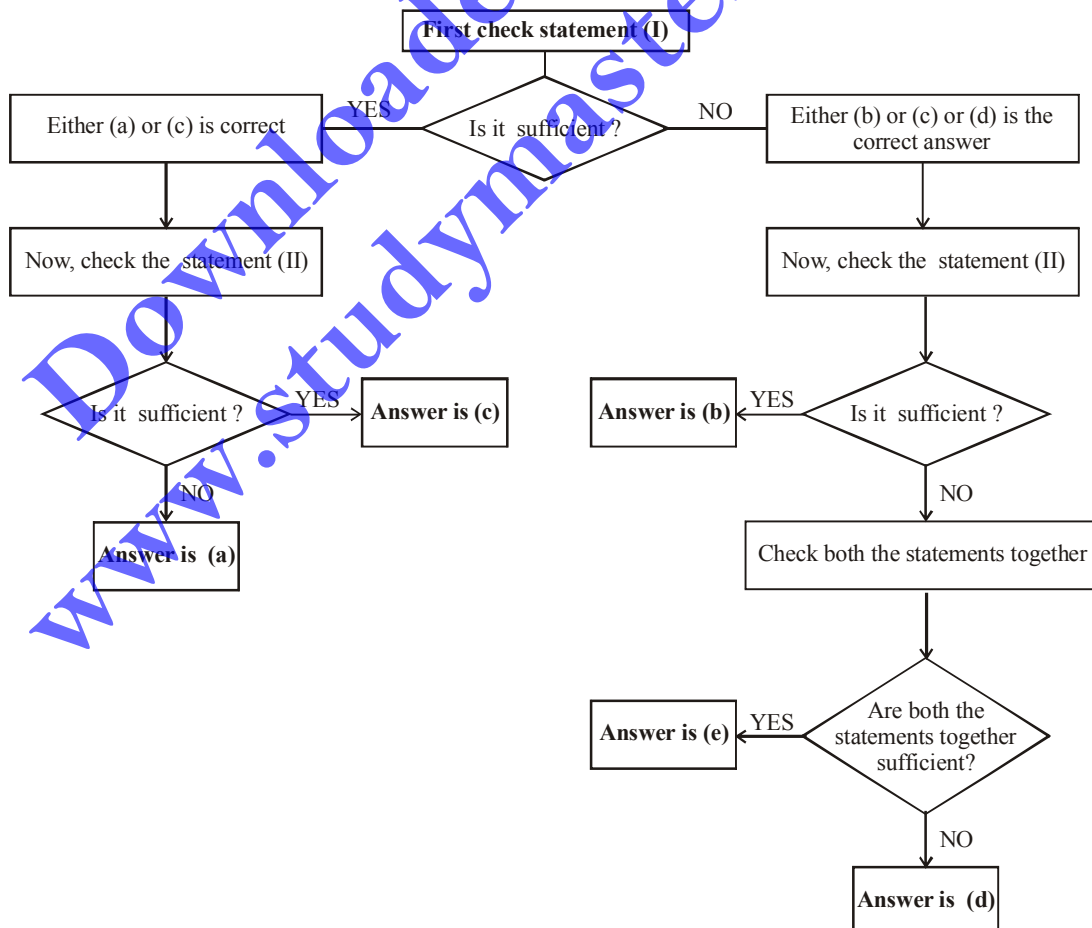
DATA SUFFICIENCY

Data sufficiency problems consist of a question and two statements. These statements contain data or information related to the question.

In data sufficiency problems, we have to decide whether the data given in the statements labelled as (I) and (II) are sufficient to solve the given problem. In Bank exam, each question consist of five answer options. These options are as follows:

- (a) If the data in Statement I alone is sufficient to answer the question, while the data in Statement II alone is not sufficient to answer the question.
- (b) If the data in Statement II alone is sufficient to answer the question, while the data in Statement I alone is not sufficient to answer the question.
- (c) If the data in Statement I alone or in Statement II alone is sufficient to answer the question.
- (d) If the data in both the Statements I and II are not sufficient to answer the question.
- (e) If the data in both the Statements I and II together are necessary to answer the question.

VERIFICATION OF DATA THROUGH FLOW CHART



SOLVED EXAMPLES

✎ Type 1 Questions Based on Quantitative Ability

DIRECTIONS : Each of the questions below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and—

Give answer (a) if the data in Statement I alone is sufficient to answer the question, while the data in Statement II alone is not sufficient to answer the question.

Give answer (b) if the data in Statement II alone is sufficient to answer the question, while the data in Statement I alone is not sufficient to answer the question.

Give answer (c) if the data in Statement I alone or in Statement II alone is sufficient to answer the question.

Give answer (d) if the data in both the Statements I and II are not sufficient to answer the question.

Give answer (e) if the data in both the Statements I and II together are necessary to answer the question.

EXAMPLE 1: What is the area of the circle ?

Statements :

- I. The breadth of a rectangle is three-fourth the radius of the circle.
- II. The radius of the circle is equal to the side of a square of area 144 sq. cm.

Sol. (b) From statement II \Rightarrow

Radius of circle

$$= \sqrt{144} = 12 \text{ cm}^2$$

$$\text{Area of circle} = \frac{22}{7} \times (12)^2$$

EXAMPLE 2: What is the cost of three tables and two chairs ?

Statements :

- I. Cost of four chairs is twice cost of three tables.
- II. Cost of two tables is equal to cost of one cot, i.e. ₹ 500/- ?

Sol. (e) From statements I + II

\Rightarrow Cost of one table

$$= 500 \div 2 = ₹ 250$$

Cost of one chair

$$= \frac{250 \times 3 \times 2}{4}$$

$$= ₹ 375$$

Cost of three tables and two chairs

$$= 250 \times 3 + 375 \times 2 = ₹ 1500$$

EXAMPLE 3: What is Jyoti's annual income ?

Statements :

- I. Jyoti's monthly income is ₹ 8,500/- more than Amit's monthly income.
- II. Rohit's monthly income is ₹ 3.5 thousand which is half of Amit's monthly income.

Sol. (e) From statements I + II

\Rightarrow Amit's monthly income

$$= 3500 \times 2$$

$$= ₹ 7000$$

Jyoti's annual income

$$= (7000 + 8500) \times 12$$

$$= ₹ 186000$$

EXAMPLE 4: What will be Suraj's age after eight years ?

Statements :

- I. The ratio between Kamya's and Suraj's present ages is 4 : 7.
- II. Kamya is 15 years younger than Suraj.

Sol. (e) Let Suraj's age = x years

$$\therefore \text{Kamya's age} = \frac{4}{7}x$$

$$\therefore x - \frac{4}{7}x = 15$$

$$\therefore x = 35$$

From statement I + II

\therefore Suraj's age after 8 years

$$= 35 + 8 = 43 \text{ years}$$

EXAMPLE 5: What is the minimum passing percentage in a test ?

Statements :

- I. Raju scored 162 marks in a test and failed by 104 marks.
- II. The maximum marks of the test are 538 more than the marks obtained by Raju.

Sol. (e) From statements I + II

\Rightarrow Maximum marks

$$= 538 + 162 = 700$$

Minimum passing percentage

$$= \frac{(162 + 104)}{700} \times 100 = 38\%$$

Type 2 Questions Based on Reasoning Ability

DIRECTIONS : Each of the questions below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and—

Give answer (a) if the data in Statement I alone is sufficient to answer the question, while the data in Statement II alone is not sufficient to answer the question.

Give answer (b) if the data in Statement II alone is sufficient to answer the question, while the data in Statement I alone is not sufficient to answer the question.

Give answer (c) if the data in Statement I alone or in Statement II alone is sufficient to answer the question.

Give answer (d) if the data in both the Statements I and II are not sufficient to answer the question.

Give answer (e) if the data in both the Statements I and II together are necessary to answer the question.

EXAMPLE ▶ 6 : What does 'Pa' mean in the code language ?

Statements :

- I 'Pe Bo Pa' means 'look at me' -and 'Bo Se Pe Ki' means 'don't look at him' in the code language'.
 II "Ka Ta Ne Pa' means 'take me and go' and 'Li Wa Si Pa' means 'either me or you' in that code language.

Sol. (c) From statement I:

PeBo Pa → Look at me

Bo Se Pe Ki → don't look at him

'Pa' means 'me'

From statement II:

Ka Ta Ne (Pa) → take (me) and go

Li Wa Si (Pa) → either (me) or you

EXAMPLE ▶ 7: How is Seema related to Mangesh?

Statements :

- I Shalini, the cousin of Mangesh, is the niece of Seema,
 II Sulekha, Seema's sister, is the wife of Omkar, Mangesh's father.

Sol. (d) From statement I: Since Seema's sex is not given, Seema may be Mangesh's father/uncle or mother/aunt
 From statement II: Seema may be Mangesh's maternal uncle or maternal aunt.

EXAMPLE ▶ 8: What is Shekhar's rank in the class of 40 ?

Statements :

- I Samir, Who is 9th from the top in the class is above Shailendra, by 12 ranks who is below Shekhar by 5 ranks.
 II Nilesh, who is between Shekhar and Sudhanshu, is 5th from the bottom.

Sol. (a) Data in statement I above is sufficient to answer the question.

EXAMPLE ▶ 9: P, Q, R, S and T hold different ranks: Who among them ranks the lowest ?

Statements :

- I S is two ranks below R, who is not the highest in rank.
 II P is higher in rank than S but below Q and T in rank.

Sol. (e) From both statements I and II:

$Q > T > R > P > S$ or $T > Q > R > P > S$

EXAMPLE ▶ 10 : Who among A, B, C, D and E runs the fastest?

Statements :

- I B runs faster than E but is not the fastest.
 II C does not run as fast as A or B, but runs faster than D and E.

Sol. (e) From both statement I and II:

$A > B > C > E > D$ or $A > B > C > D > E$

EXERCISE

DIRECTION (Qs.1-5) : Each of the questions below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and:

Give answer (a) If the data in Statement I alone is sufficient to answer the question, while the data in Statement II alone is not sufficient to answer the question.

Give answer (b) If the data in Statement II alone is sufficient to answer the question, while the data in Statement I alone is not sufficient to answer the question.

Give answer (c) If the data in Statement I alone or in Statement II alone is sufficient to answer the question.

Give answer (d) If the data in both the Statements I and II are not sufficient to answer the question.

Give answer (e) If the data in both the Statements I and II together are necessary to answer the question.

1. What is the area of the circle?

Statements :

- I. Perimeter of the circle is 88 cms.
- II. Diameter of the circle is 28 cms.

2. What is the area of the right-angled triangle?

Statements :

- I. Height of the triangle is three-fourth of the base.
- II. Hypotenuse of the triangle is 5 metres.

3. What is the father's present age?

Statements :

- I. Father's present age is five times the son's present age.
- II. Five years ago the father's age was fifteen times the son's age at that time.

4. What is the rate of interest?

Statements :

- I. Simple interest accrued on an amount of ₹ 25,000 in two years is less than the compound interest for the same period by ₹ 250.
- II. Simple interest accrued in 10 years is equal to the principal.

5. What is the number of trees planted in the field in rows and columns?

Statements :

- I. Number of columns is more than the number of rows by 4.
- II. Number of trees in each column is an even number.

DIRECTIONS (Qs. 6-20) : Each question below is followed by two statements I and II. You are to determine whether the data given in the statements is sufficient for answering the question. You should use the data and your knowledge of Mathematics to choose between the possible answers.

Give answer (a) if the statement I alone is sufficient to answer the question, but the statement II alone is not sufficient.

Give answer (b) if the statement II alone is sufficient to answer the question, but the statement I alone is not sufficient.

Give answer (c) if both statements I and II together are needed to answer the question.

Give answer (d) if either the statement I alone or statement II alone is sufficient to answer the question.

Give answer (e) if you cannot get the answer from the statement I and II together, but need even more data.

6. The ages of Anand and Sujeet are in the ratio of 6 : 5 respectively. What is the age of Anand?

Statements :

- I. The ages of Anand and Sandeep are in the ratio of 10 : 7.
- II. After 5 years the ratio of Anand's and Sujeet's ages will be 7 : 6.

7. What is the three digit number?

Statements :

- I. Three-fifth of that number is less by 90 than of that number.
- II. One-fourth of that number is 25% of that number

8. In how many days can 14 men complete a piece of work?

Statements :

- I. 18 women can complete the same piece of work in 24 days.
- II. 28 children can complete the same piece of work in 56 days.

9. What is the salary of A, in a group of A, B, C, D and E, whose average salary is ₹ 65,780?

Statements :

- I. Total of the salary of B and C is ₹ 88,545.
- II. Total of the salary of D and E is ₹ 59,020.

10. What is the profit earned by selling a watch for ₹ 15,675 ?

Statements :

- I. The cost price of 5 such watches is equal to selling price of 4 such watches.
- II. 25% profit is earned by selling each watch.

11. What is the rate of interest p.c.p.a. on an amount of ₹ 12,000 deposited in a bank?

Statements :

- I. The difference between the simple interest and compound interest is ₹ 172.8.
 II. The simple interest for two years is ₹ 2,880.

12. What is the profit earned by selling a Laptop for ₹ 26,250?

Statements :

- I. The cost price of 5 such Laptops is equal to selling price of 4 such Laptops.
 II. 25% profit is earned by selling each Laptop.

13. How many women can complete a piece of work in 15 days?

Statements :

- I. If 12 women can complete the same piece of work in 20 days.
 II. If 10 men can complete the same piece of work in 12 days.

14. What is the three digit number?

Statements :

- I. The three digit number is an exact multiple of 13.
 II. The first and the third digit of the number are 7.

15. What is the age of C, in a group of A, B, C, D and E whose average age is 45 years?

Statements :

- I. Average of the ages of A and B is 53 years.
 II. Average of the ages of D and E is 47 years.

16. What is the number of teachers in the school?

Statements :

- I. Each teacher takes at least three lectures in a day.
 II. There are 45 lectures in a week.

17. In how many years can a simple interest of ₹ 6,570 be obtained on an amount of ₹ 36,500 ?

Statements :

- I. The rate of simple interest is 6 p.c.p.a.
 II. The difference between the simple interest and compound interest is ₹ 402.084.

18. What is the three digit number?

Statements :

- I. Two-fifth of the number is half of 204.
 II. 20% of the number is 51.

19. What is Raveena's age?

Statements :

- I. Raveena is half as old as Karishma.
 II. Raveena's age is $\frac{3}{5}$ th of her mother's age who is 45 years old.

20. What is the area of the rectangular plot?

Statements :

- I. The length of the plot is 375 metres.
 II. The length of the plot is thrice it's breadth.

DIRECTIONS (21-25) : In these questions, a question is given followed by information in three statements. You have to consider the information in all the three statements and decide which information in the statement(s) is not necessarily required to answer the question and therefore can be dispensed with. Indicate your answer accordingly.

21. How many students from Institute 'A' got placement?

Statements :

- I. Number of students studying in Institutes A & B are in the ratio of 3 : 4 respectively.
 II. Number of students who got placement from Institute B is 120% of the number of students who got placement from Institute A.
 III. 80% of the students studying in Institute B got placement.

- (a) None of the statements can be dispensed with.
 (b) Only I
 (c) Only II
 (d) Anyone of the three
 (e) Question cannot be answered even with the information in all three statements

22. What is the monthly income of Mr. X?

Statements :

- I. Mr. X spends 85% of his income on various items and remaining amount is saved.
 II. Monthly savings of Mr. X are ₹ 4,500/-.
 III. Out of the total money spent by Mr. X in a month, one-fifth is spent on food and remaining amount of ₹ 20,400 on other items.

- (a) Only II
 (b) Only III
 (c) Only either II or III
 (d) Question cannot be answered even with the information in all three statements
 (e) None of these

23. What is Suchitra's present age?

Statements :

- I. Suchitra's present age is double the age of her son.
 II. Ratio between present ages of Suchitra and her mother is 2 : 3 respectively.
 III. Four years hence the ratio between Suchitra's age and her son's age will be 24 : 13.

- (a) Only II

- (b) Only III
(c) Either I or II only
(d) Either II or III only
(e) None of these
24. What is Neeta's share in the profit earned at the end of 2 years in a joint business run by Neeta, Seeta and Geeta?
- Statements :**
- I. Neeta invested ₹ 85,000/- to start the business.
II. Seeta and Geeta joined Neeta's business after six months, investing amounts in the ratio of 3 : 5 respectively.
III. Total amount invested by Seeta and Geeta is ₹ 2.5 lacs
- (a) Only II
(b) Only III
(c) Only either II or III
(d) Information in all three statements is required for answering the question.
(e) Question cannot be answered even with the information in all three statements.
25. What is the labelled price of the article?
- Statements :**
- I. Cost price of the article is ₹ 500.
II. Selling price after offering 5% discount on the labelled price is ₹ 608.
III. Profit earned would have been 28% if no discount was offered.
- (a) Only I (b) Only III
(c) Only II & III (d) Only II
(e) Only I and II
- DIRECTION (Q. 26-74) :** Each of the questions below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and:
- Give answer (a) If the data in Statement I alone is sufficient to answer the question, while the data in Statement II alone is not sufficient to answer the question.
Give answer (b) If the data in Statement II alone is sufficient to answer the question, while the data in Statement I alone is not sufficient to answer the question.
Give answer (c) If the data in Statement I alone or in Statement II alone is sufficient to answer the question.
Give answer (d) If the data in both the Statements I and II are not sufficient to answer the question.
Give answer (e) If the data in both the Statements I and II together are necessary to answer the question.
26. How is A related to B ?
- Statements :**
- I. A is sister-in-law of C who is the daughter-in-law of B who is the wife of D.
II. B is the mother of A's son's only uncle's son.
27. Amongst A, B, C, D, E and F each having a different height, who is the shortest?
- Statements :**
- I. C is shorter than only B.
II. A is taller than only D and F.
28. Point X is in which direction with respect to Y ?
- Statements :**
- I. Point Z is at equal distance from both point X and point Y.
II. Walking 5 km. to the East of point X and taking two consecutive right turns after walking 5 kms before each turn leads to point Y.
29. How is 'must' written in a code language?
- Statements :**
- I. 'you must see' is written as 'la pa ni' and 'did you see' is written as 'jo ni pa' in that code language
II. 'you did that' is written as 'pa si jo' in that code language.
30. On which day of the week does Arti's birthday fall ?
- Statements :**
- I. Sonu correctly remembers that Arti's birthday falls after Wednesday but before Sunday.
II. Raj correctly remembers that Arti's birthday falls before Friday but after Tuesday.
31. Who is in the middle of the row comprising A, B, C, D and E?
- Statements :**
- I. B is to right of C, who is second from the left.
II. A is standing to the left of C, who is D's neighbour.
32. What is Shilpa's rank in the class?
- Statements :**
- I. The class strength is 45
II. Shilpa is eight ranks below Mahesh who stood 17th.
33. Who runs the fastest among L, M, N and P ?
- Statements :**
- I. P runs faster than L, who is the slowest. .
II. M runs faster than N but slower than P.
34. On which day of the week did Satish watch a movie ?
- Statements :**
- I. Satish only watches movies with his friends.
II. Satish went out for dinner on Tuesday.

35. How is Gita related to Ganesh ?

Statements :

- I. Gita's brother is Ganesh's father's eldest son.
- II. Ganesh's wife's mother-in-law is Gita's mother.

36. Lalita is in which direction with respect to Sangita ?

Statements :

- I. Lalita is to the East, of Prabha who is to the South of Sangita.
- II. Vinita is to the North of Lalita who is to the East of Sangita.

37. What is the code for 'play' in the code language?

Statements :

- I. In the code language 'play and dance' is written as 'ka to pe'
- II. In the code language 'enjoy the dance' is written as 'pe jo ra'.

38. How many children are there in the class ?

Statements :

- I. Vandana's rank in the class is five ranks below, Nandini who is twenty fifth from the bottom.
- II. Nandini's rank is seventeenth from the top.

39. Who is tallest among Neeta, Sudha, Radha, Maya and Geeta?

Statements :

- I. Radha is shorter than Neeta and Sudha but not shorter than Maya and Geeta.
- II. Neeta is not the tallest.

40. How many sons does Ramesh have?

Statements :

- I. F is sister of H who is son of Ramesh.
- II. R is brother of H.

41. How is 'cricket' written in the code language?

Statements :

- I. 'Dinesh, play cricket' is written as 'do, si ha'.
- II. 'play cricket now' is written as 'ha si ma'.

42. Who is the oldest among L, M, N, O, P?

Statements :

- I. P is older than M and N but not O.
- II. L is older than O.

43. When is Rahul's birthday?

Statements :

- I. Rahul and Shivani are twins.
- II. Rahul was born on the last day of February in a leap year.

44. What is the strength of the class?

Statements :

- I. Shekhar stood 28 ranks below the top ranker and Mahesh, who stood 5 ranks below him, stood last.
- II. Jayesh was 9 ranks below Ramesh, who stood 27th from the top.

45. How far does Shruti live from the school?

Statements :

- I. Shruti has to cycle 3 kms to her friend Mina's house which is 4 kms from the school.
- II. Gitanjali lives exactly opposite to the school and walks 2 kms to reach Shruti's house.

46. Who is the youngest among P, Q, R, S and T?

Statements :

- I. Q is younger than R and S but not as young as P.
- II. T is not the youngest.

47. How many children are there in the class ?

Statements :

- I. If arranged in ascending order of height, Suma is tenth from the top.
- II. In order of height, Suma is five positions above Ranjit who is eighth from the bottom.

48. What is the code for 'going' in the code language ?

Statements :

- I. In the code language 'where are you going' is written as 'ma ka ta re'
- II. In the code language 'going to college' is written as 'lo pe ta'

49. How is Shamim related to Mr. Varghese?

Statements :

- I. Shamim's son is the only grandson of Mr Varghese.
- II. Mr. Varghese has only one son.

50. Village X is in which direction with respect to village Y?

Statements :

- I. X is to the East of Z, which is to the North of Y.
- II. X is to the North of L, which is to the East of Y.

51. 'D' is in which direction with respect to 'E'?

Statements :

- I. N is to the West of E and D is to the East of N.
- II. P is to the East of E and D is midway between P and E.

52. Among M, N, O, P and Q, who reached the temple first?

Statements :

- I. N was the only one who reached the temple earlier than P.
- II. M, who reached the temple earlier than O and Q, was not the one to reach earliest.

53. What is Ketan's rank in the class of 45 students ?

Statements :

- I. Latish who is 7 ranks above Ketan, is 25th from the bottom.
- II. Satwik is 20th from the top and 4 ranks above Ketan.

54. What is the code for 'nail' in the language?

Statements :

- I. 'best nail polish' is coded as 'te lo ni'.
- II. 'sharp nail' is coded as 'me te'.

55. Who is the youngest among R, S, T, U and V?

Statements :

- I. T is younger than S and older than R and V.
- II. U is younger than T but not the youngest.

56. In which direction is Raj facing?

Statements :

- I. Raj and Rohan are facing each other.
- II. Rohan is facing north-west.

57. Who among Deena, Meena, Teena and Reena is the eldest ?

Statements :

- I. Meena is not the eldest.
- II. Teena is younger than Reena.

58. How will 'SOLID' be coded ?

Statements :

- I. All the vowels have to be coded as the alphabet that follows them in the English alphabetical series.
- II. C, R and N are coded as B, Q, and M respectively and O, U and I are coded as P, V and J respectively and a similar logic is followed for other alphabets.

59. How is J related to N ?

Statements :

- I. R is the brother of J and N is the son of R.
- II. J is the sister of R and N is the son of R.

60. How is 'last' coded in the code language ?

Statements :

- I. 'heavy rains last night' is coded as 'na ke ja lo' and 'finished last in race' is coded as 'so lo to pa'.
- II. 'the furniture should last' is written as 'di wi lo be' and 'give me last chance' is written as 'lo fa ra qi'.

61. Amongst five friends seated in a straight line facing North, is B sitting at the extreme left end ?

Statements :

- I. B, D are immediate neighbours of each other. Similarly E, C are also immediate neighbours of each other. A sits exactly in the middle of the line.

II. A, who sits exactly in the middle of the line, is second to the left of C. B is not an immediate neighbour of A.

62. Which direction is Shilpa facing ?

Statements :

- I. If Meeta who is currently facing South, and turns 90° towards her left, she would face the same direction as Shilpa.
- II. If Uday who is currently facing North, turns 90° towards his left, he would face a direction just opposite to the direction Shilpa is facing.

63. Is A brother of B ?

Statements :

- I. D is mother of B and B is son of C. C is father of A.
- II. E is sister of A and F is brother of A.

64. How many kilometers did Karan drive today ?

Statements :

- I. Karan correctly mentions that he drove less than 20 km but more than 14 km today.
- II. Karan's friend correctly mentions that Karan drove more than 10 km but less than 16 km today.

65. Who reached the station first among L, M, J, T & R if no two persons reached together?

Statements :

- I. M reached only after J & T.
- II. L reached before R.

66. Tower 'P' is in which direction with respect to tower 'Q'?

Statements :

- I. P is to the West of H, which is to the South of Q.
- II. F is to the West of Q and to the North of P.

67. What is Suneeta's rank from top in the class?

Statements :

- I. In the class of 42 children Suneeta is 29th from the bottom.
- II. Suneeta is ten ranks below Samir.

68. What is the code for 'walks' in the code language?

Statements :

- I. In the code language 'she walks fast' is written as 'he ka to'.
- II. In the code language 'she learns fast' is written as 'jo ka he'.

69. How is K related to N?

Statements :

- I. N is brother of M who is daughter of K.
- II. F is husband of K.

70. 31. How is M related to F?

Statements :

- I. F is sister of N who is mother of R.
- II. M has two brothers of which one is R.

71. On which date in March was Pravin's father's birthday?

Statements :

- I. Pravin correctly remembers that his father's birthday is after 14th but before 19th March.
- II. Pravin's sister correctly remembers that their father's birthday is after 17th but before 21st March.

72. Among M, N, T, R and D each having different age, who is the youngest?

Statements :

- I. N is younger than only D among them.
- II. T is older than R and younger than M.

73. How is 'food' written in the code language?

Statements :

- I. 'Always eat good food' is written as 'ha na pa ta' in the code language.
- II. 'Enjoy eating good food' is written as 'ni ha ja pa' in the code language.

74. Village D is in which direction of village H?

Statements :

- I. Village H is in south of village A, which is in south east of village D.
- II. Village M is in east of village D & is in North-east of village H.

ANSWER KEY

1	(c)	16	(e)	31	(a)	46	(e)	61	(b)
2	(e)	17	(a)	32	(b)	47	(e)	62	(c)
3	(e)	18	(d)	33	(e)	48	(e)	63	(d)
4	(c)	19	(b)	34	(d)	49	(d)	64	(e)
5	(d)	20	(c)	35	(d)	50	(c)	65	(d)
6	(b)	21	(e)	36	(c)	51	(b)	66	(c)
7	(a)	22	(e)	37	(d)	52	(a)	67	(a)
8	(e)	23	(e)	38	(e)	53	(c)	68	(e)
9	(c)	24	(d)	39	(e)	54	(e)	69	(e)
10	(d)	25	(d)	40	(d)	55	(d)	70	(d)
11	(b)	26	(c)	41	(d)	56	(e)	71	(e)
12	(d)	27	(d)	42	(e)	57	(d)	72	(a)
13	(a)	28	(b)	43	(b)	58	(b)	73	(d)
14	(c)	29	(a)	44	(a)	59	(e)	74	(c)
15	(c)	30	(e)	45	(b)	60	(c)		

ANSWERS & EXPLANATIONS

1. (c) Let the radius of circle = R cm
then, area of circle = πR^2
From statement I,
Circumference of circle = $2\pi R = 88$ cm
or $R = \frac{88 \times 7}{2 \times 22} = 14$ cm
From statement II,
Diameter of circle = $2R = 28$ cm
or $R = \frac{28}{2} = 14$ cm
Hence, either statement I or statement II alone is sufficient to give the answer.
2. (e) Let the base and height of right angled triangle be a and h respectively
From statement I,
 $h = \frac{3}{4}a$... (i)
From statement II,
Hypotenuse of triangle = 5 m
or $\sqrt{a^2 + h^2} = 5$
or $\sqrt{a^2 + \left(\frac{3}{4}a\right)^2} = 5$
 $\therefore a^2 = 16$
or $a = 4$
Hence, both statements together are necessary to give the answer.
3. (e) Let the present age of father and son be x and y years respectively.
From statement I,
 $x = 5 \times y$... (i)
From statement II,
 $x - 5 = 15 \times (y - 5)$... (ii)
Solving for x and y we get $x = 35$. So both statements together are necessary to give the answer.
4. (c) Let the rate of interest = R% annually. Then
From statement I,
 $250 = 25000 \left(\frac{R}{100}\right)^2$
or $R^2 = 100$
or $R = 10\%$
From statement II,
 $I = \frac{P \times R \times 10}{100}$
or $\frac{R}{10} = \frac{I}{P} = 1$
or $R = 10\%$
Hence,
Hence, either statement I or statement II is sufficient to give the answer.
5. (d) Clearly, we cannot answer the question even using both the statements together.
6. (b) From statement II,
 $\Rightarrow \frac{6x + 5}{5x + 5} = \frac{7}{6}$
 $\Rightarrow 36x - 35x = 35 - 30$
 $\Rightarrow x = 5$
 \therefore Age of Anand = $6 \times 5 = 30$ years
7. (a) From statement I,
 $\Rightarrow \text{Number} = \frac{90 \times 5}{5 - 3} = 225$
8. (e) Comparison of men with either women or children is not given. So question can't be answered.
9. (c) From statement I and II,
 $\Rightarrow \text{Salary of A}$
 $= 65780 \times 5 - (88545 + 59020)$
 $= 328900 - 147565 = ₹ 181335$
10. (d) From statement I,
 $\Rightarrow \text{Profit} = 15675 - 15675 \times \frac{4}{5} = ₹ 3135$

From statement II,

$$\Rightarrow \text{Profit} = 15675 - 15675 \times \frac{100}{125} = ₹ 3135$$

11. (b) From statement II, \Rightarrow

$$\text{Rate} = \frac{2880 \times 100}{12000 \times 2} = 12\%$$

Since statement I does not mention the time period, it has no relevance to the question.

12. (d) From statement I, \Rightarrow

$$\text{Profit} = 26250 - 26250 \times \frac{4}{5} = ₹ 5250$$

From statement II,

$$\text{Profit} = 26,250 - 26,250 \times \frac{100}{125} = ₹ 5250$$

13. (a) From statement I,

$$\Rightarrow \frac{12 \times 20}{15} = 16$$

From statement II,

There is no comparison between male and female.

14. (c) From statement II \Rightarrow the numbers could be

707, 717, 727, 737, 747, 757, 767, 777, 787, 797.

From statement I, out of the 10 numbers only 767 is divisible by 13.

15. (c) From statement I + II \Rightarrow age of C

$$= 45 \times 5 - (53 \times 2 + 47 \times 2)$$

$$= 225 - 200 = 25 \text{ years}$$

16. (e) The question cannot be answered even after using information of both statements together.

17. (a) From statement I

$$\Rightarrow \text{years} = \frac{6570 \times 100}{36500 \times 6} = 3 \text{ years}$$

Statement II does not give the rate of interest & so cannot be used.

18. (d) From statement I \Rightarrow Three digit number

$$= \frac{204}{2} \times \frac{5}{2} = 255$$

From statement II \Rightarrow Three digit number

$$= \frac{51 \times 100}{20} = 255$$

19. (b) From statement II

$$\Rightarrow \text{Raveena's age} = 45 \times \frac{3}{5} = 27 \text{ years}$$

20. (c) From statement I

$$\Rightarrow \text{Length} = 375 \text{ metres}$$

$$\text{From II} \Rightarrow \text{Breadth} = \frac{375}{3} = 125 \text{ metres}$$

21. (e) The question can't be answered even with all three statements.

22. (e) The question can be answered with I and either II or III.

23. (e) The question can be answered with only I and III.

24. (d) All the three statements are required to answer the question.

25. (d) The question can be answered with only statement II.

$$\text{Labelled price} = 608 \times \frac{100}{95} = ₹ 640$$

26. (c) From statement I

$$\Rightarrow \text{A is daughter of B.}$$

From statement II

$$\Rightarrow \text{B is sister-in-law of A.}$$

27. (d) From statement I

$$\Rightarrow \text{B C} \text{ ----}$$

(arranged in order from tallest to shortest)

From statement II

$$\Rightarrow \underline{\text{A D F}} \text{ ___ or ___ } \underline{\text{A F D}}$$

I + II \Rightarrow The shortest can't be determined.

28. (b) From statement II

$$\Rightarrow \text{Point X is in north with respect to Y.}$$

29. (a) From I \Rightarrow (you) must = (see) = la (pa) (ni)

$$\text{did (you) (see) = jo (ni) (pa)}$$

So, must = la

30. (e) From I \Rightarrow Thursday or Friday or Saturday

From II \Rightarrow Wednesday or Thursday

I + II \Rightarrow Arti's birthday falls on Thursday.

31. (a) From I \Rightarrow B is third from left and so is in the middle.

From II \Rightarrow There is no clarity of who is where.

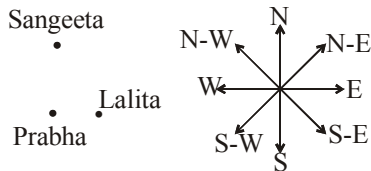
32. (b) From statement II,

$$\text{Shilpa's rank} = 17 + 8 = 25^{\text{th}}$$

33. (e) From statement I + II

$$P > M > N > L$$

34. (d) The data in both the Statements I and II are not sufficient to answer the question.
35. (d) There is no information about Geeta's gender so relationship between Geeta & Ganesh cannot be determined.
36. (c) From statement I,



Lalita is in South East direction of Sangeeta

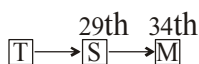
From statement II,

- Vineeta
- Lalita

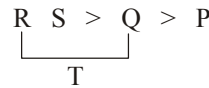
Sangeeta

Lalita is in east direction of Sangeeta

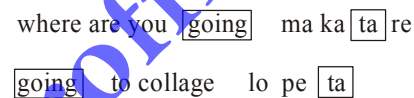
37. (d) play and dance → ka to pe
 enjoy the dance → pe jo ra
 Hence, the code for 'play' is either 'ka' or 'to'.
38. (e) From statement I, Vandana is 30th from bottom.
 From statement II, Vandana's rank is 22nd from top.
 So there are $22 + 30 - 1 = 51$ Children in the class
39. (e) From statement I + II,
 Sudha > Neeta > Radha > Maya, Geeta
40. (d) Even by combining both statements, we cannot determine how many sons Ramesh has.
41. (d) From statement I + II
 Dinesh play cricket → do si ha
play cricket now → ha si ma
 Hence the code for 'cricket' is either 'ha' or 'si'.
42. (e) From statement I + II
 $L > O > P > M, N$
43. (b) From statement II,
 Rahul's birthday = 29 February
44. (a) From statement I,



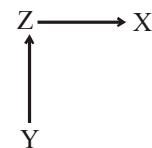
- So strength of class is 34 students.
45. (b) Statement I does not inform whether Mina's house is towards the school or in the other direction to Shruti's house.
 From statement II, we can infer that Shruti lives 2 km from the school.
46. (e) From statement I + II



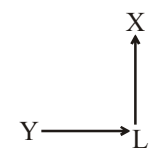
- Hence, P is the youngest among P, Q, R, S and T
47. (e) From statement I + II
 Suma's rank from the top = 10th
 Suma's rank from the bottom = $8 + 5 = 13$ th
 Number of children are there in the class
 $= (10 + 13) - 1 = 22$
48. (e) From statement I + II



49. (d) From statement I,
 Shamim is the son or daughter of Mr Varghese, but Shamim's gender is not known.
 From statement II it is not clear whether Mr. Verghese has any daughters or not. So we cannot determine whether Shamim is the son or daughter of Mr. Verghese.
50. (c) From statement I,



X is north-east of Y
 From statement II,



X is north-east of Y

51. (b) From statement I,

$N \leftarrow E$

D or D

Since D's position is not clear, hence statement I is not sufficient.

From statement II,

$E \rightarrow D \leftarrow P$

So, D is east of E.

52. (a) From statement I, M, O and Q are behind P; so N reached the temple first.

Statement II does not tell who reached first out of N and P.

53. (c) From statement I,



\therefore Ketan's rank from the top = 28th

From statement II,



\therefore Ketan's rank from the top = 24th

54. (e) From statement I,

'best nail polish' \rightarrow 'te lo ni'

From statement II,

'sharp nail \rightarrow 'me te'

\therefore From statement I and II : nail \rightarrow te

55. (d) From statement I, $S > T > R, V$

From statement II, $T > U$

Even by combining both statements, we cannot find who is youngest; R, U or V.

56. (e) I + II \Rightarrow Raj is facing South-East.

57. (d) No information is given about Deena. So the question can't be answered.

58. (b) From statement II,

\Rightarrow SOLID is coded as RPKJC.

59. (e) From statement I and II

\Rightarrow J is paternal aunt of N.

60. (c) From statement I

\Rightarrow heavy rains last night

= na ke ja lo

finished last in race

= so lo to pa

\therefore last = lo

From statement II

\Rightarrow The furniture should last

= di wi lo be

give me last chance

= lo fa ra qi

\therefore last = lo

61. (b) From statement II, \Rightarrow B D A E C or B E A D C

So, B is sitting at the extreme left end.

62. (c) From statement I \Rightarrow Shilpa is facing East.

From statement II \Rightarrow Shilpa is facing East.

63. (d) From statement I \Rightarrow A's gender can't be determined.

From statement II \Rightarrow A's gender can't be determined.

64. (e) From statement I and II \Rightarrow Karan drove 15 kilometers today.

65. (d) From statement I

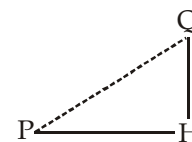
\Rightarrow J, T, M or T, J, M

From statement II

\Rightarrow L, R

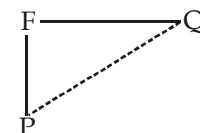
So this cannot be determined.

66. (c) From statement I



\Rightarrow So, P is in South - West of Q.

From statement II



\Rightarrow So, P is in South - West of Q.

67. (a) From statement I \Rightarrow

Sunita's rank from top

= $42 - 29 + 1 = 14$ th

From II \Rightarrow Sameer's rank is not known. So Sunita's rank can't be determined.

68. (e) From I \Rightarrow she walks fast = he ka to
 From II \Rightarrow she learns fast = ja ka he
 From I + II \Rightarrow walks = to

69. (e) From I \Rightarrow N is son of K.
 From II \Rightarrow F is husband of K.
 From I + II \Rightarrow K is mother of N.

70. (d) Even after joining the two statements M's sex can't be determined. So M's relation with F can't be determined.

71. (e) From I \Rightarrow 15 th or 16th or 17th or 18 th
 From II \Rightarrow 18th or 19th or 20th
 From I + II \Rightarrow Birthday was on 18th March.

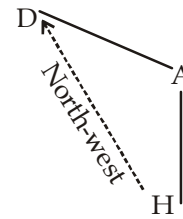
72. (a) From I \Rightarrow N is the youngest among them.

73 (d) From I \Rightarrow Always eat good food \Rightarrow ha na pa ta

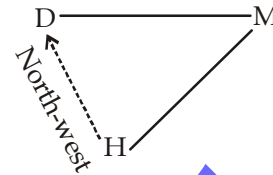
II \Rightarrow Enjoy eating good food \Rightarrow ni ha ja pa

Hence the code for 'food' is either 'ha' or 'pa'.

74. (c) From I \Rightarrow



From II \Rightarrow



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PRACTICE SET

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $1/4^{\text{th}}$ of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-10): What will come in place of the question mark (?) in the following equations ?

- $$\frac{117 \times 117 \times 117 - 98 \times 98 \times 98}{117 \times 117 + 117 \times 98 + 98 \times 98} = ?$$

(a) 215 (b) 311 (c) 19 (d) 29
(e) None of these
- If $\frac{a}{b} = \frac{4}{3}$, then $\frac{3a+2b}{3a-2b} = ?$

(a) 6 (b) 3 (c) 5 (d) -1
(e) None of these
- $$\sqrt{\frac{?}{196}} = \frac{72}{56}$$

(a) 18 (b) 14 (c) 324 (d) 212
(e) None of these
- $$\frac{17.28 \div ?}{3.6 \times 0.2} = 200$$

(a) 120 (b) 1.20 (c) 12 (d) 0.12
(e) None of these
- $$\frac{(3.537 - 0.948)^2 + (3.537 + 0.948)^2}{(3.537)^2 + (0.948)^2} = ?$$

(a) 4.485 (b) 2.589 (c) 4 (d) 2
(e) None of these
- $$\frac{(272 - 32)(124 + 176)}{17 \times 15 - 15} = ?$$

(a) 0 (b) 2.25 (c) 300 (d) 240
(e) None of these
- $$\frac{50}{?} = \frac{?}{12\frac{1}{2}}$$

(a) $\frac{25}{2}$ (b) $\frac{4}{25}$ (c) 4 (d) 25
(e) None of these
- $$\frac{112}{\sqrt{196}} \times \frac{\sqrt{576}}{12} \times \frac{\sqrt{256}}{8} = ?$$

(a) 8 (b) 12 (c) 16 (d) 32
(e) None of these
- $$\frac{?}{\sqrt{2.25}} = 550$$

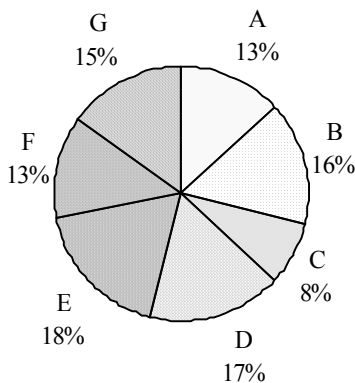
(a) 825 (b) 82.5 (c) 3666.66 (d) 2
(e) None of these
- $$\frac{\sqrt{5} - \sqrt{3}}{\sqrt{5} + \sqrt{3}} = ?$$

(a) $4 + \sqrt{15}$ (b) $4 - \sqrt{15}$
(c) $\frac{1}{2}$ (d) 1
(e) None of these

DIRECTIONS (Qs. 11-15) : Study the following chart to answer the questions given below :

Villages	% population below poverty line
A	45
B	52
C	38
D	58
E	46
F	49
G	51

Proportion of population of seven villages in 1995



11. In 1996, the population of villages A as well as B is increased by 10% from the year 1995. If the population of village A in 1995 was 5000 and the percentage of population below poverty line in 1996 remains same as in 1995, find approximately the population of village B below poverty line in 1996.
- (a) 4000 (b) 45000
(c) 2500 (d) 3500
(e) None of these
12. If in 1997 the population of village D is increased by 10% and the population of village G is reduced by 5% from 1995 and the population of village G in 1995 was 9000, what is the total population of villages D and G in 1997?
- (a) 19770 (b) 19200
(c) 18770 (d) 19870
(e) None of these
13. If in 1995 the total population of the seven villages together was 55,000 approximately, what will be population of village F in that year below poverty line ?
- (a) 3000 (b) 2500
(c) 4000 (d) 3500
(e) None of these
14. If the population of village C below poverty line in 1995 was 1520, what was the population of village F in 1995 ?
- (a) 4000 (b) 6000
(c) 6500 (d) 4800
(e) None of these
15. The population of village C is 2000 in 1995. What will be the ratio of population of village C below poverty line to that of the village E below poverty line in that year ?

- (a) 207 : 76 (b) 76 : 207
(c) 152 : 207 (d) Data inadequate
(e) None of these
16. A train is moving at a speed of 132 km/h. If the length of the train is 110 metres, how long will it take to cross a railway platform, 165 metres long ?
- (a) 5s (b) 7.5s (c) 10s (d) 15s
(e) None of these
17. If 15 women or 10 men can complete a project in 55 days, in how many days will 5 women and 4 men working together complete the same project ?
- (a) 75 (b) 8 (c) 9 (d) 85
(e) None of these
18. Ashu's mother was three times as old as Ashu, 5 years ago. After 5 years, she will be twice as old as Ashu. How old is Ashu at present?
- (a) 15 (b) 20 (c) 10 (d) 5
(e) None of these
19. A conical flask has base radius ' a ' cm and height ' h ' cm. It is completely filled with milk. The milk is poured into a cylindrical thermos flask whose base radius is ' p ' cm. What will be the height of the solution level in the flask ?
- (a) $\frac{a^2h}{3p^2}$ cm (b) $\frac{3hp^2}{a^2}$ cm (c) $\frac{p^2}{3h^2}$ cm (d) $\frac{3a^2}{hp^2}$ cm
(e) None of these
20. A sum was put at simple interest at a certain rate for 2 years. Had it been put at 3% higher rate, it would have fetched ₹ 300 more. Find the sum.
- (a) ₹ 6000 (b) ₹ 8230 (c) ₹ 5000 (d) ₹ 4600
(e) None of these

DIRECTIONS (Qs. 21-25) : Identify which number is wrong in the given series.

21. 2, 3, 4, 4, 6, 8, 9, 12, 16.
(a) 3 (b) 9
(c) 6 (d) 12
(e) None of these
22. 3, 4, 10, 32, 136, 685, 41
(a) 136 (b) 10
(c) 4116 (d) 32
(e) None of these
23. 69, 55, 26, 13, 5
(a) 26 (b) 13
(c) 5 (d) 55
(e) None of these
24. 24576, 6144, 1536, 386, 96, 4
(a) 386 (b) 6144
(c) 96 (d) 1536
(e) None of these
25. 11, 5, 20, 12, 40, 26, 74, 54
(a) 5 (b) 20
(c) 40 (d) 26
(e) None of these

DIRECTIONS (Qs. 26-30): Find out the approximate value which should come in place of the question mark in the following questions. (You are not expected to find the exact value.)

26. $\sqrt{45689} = ?$
 (a) 180 (b) 415
 (c) 150 (d) 210
 (e) 300
27. $\frac{(10008.99)^2}{10009.001} \times \sqrt{3589} \times 0.4987 = ?$
 (a) 3000 (b) 300000
 (c) 3000000 (d) 5000
 (e) 9000000
28. $399.9 + 206 \times 11.009 = ?$
 (a) 2800 (b) 6666
 (c) 4666 (d) 2400
 (e) 2670
29. $\frac{2}{5} + \frac{7}{8} \times \frac{17}{19} \div \frac{6}{5} = ?$
 (a) 1 (b) $\frac{1}{2}$
 (c) $2\frac{1}{2}$ (d) $\frac{3}{4}$
 (e) $\frac{9}{11}$
30. $(299.99999)^3 = ?$
 (a) 27000000 (b) 9000000000
 (c) 180000 (d) 2.7×10^9
 (e) 2700000
31. A reduction of 20% in the price of sugar enables a purchaser to obtain $2\frac{1}{2}$ kg more for ₹ 160. Find the original price per kg of sugar.
 (a) ₹ 12 (b) ₹ 20 (c) ₹ 16 (d) ₹ 18
 (e) None of these
32. Mrs. X spends ₹ 535 in purchasing some shirts and ties for her husband. If shirts cost ₹ 43 each and the ties cost ₹ 21 each, then what is the ratio of the shirts to the ties, that are purchased?
 (a) 1 : 2 (b) 2 : 1 (c) 2 : 3 (d) 3 : 4
 (e) None of these
33. Anish spends 25% of his salary on house rent, 5% on food, 15% on travel, 10% on clothes and the remaining amount of ₹ 22,500 is saved. What is Anish's salary?
 (a) ₹ 40,000 (b) ₹ 40,500
 (c) ₹ 45,500 (d) ₹ 50,000
 (e) None of these

34. $\frac{2}{5}$ th of Anil's salary is equal to Bhuvan's salary and seven-ninth of Bhuvan's salary is equal to Chandra's salary. If the sum of the salary of all of them is ₹ 77,000, then, how much is Bhuvan's salary?
 (a) ₹ 45,000 (b) ₹ 18,000
 (c) ₹ 15,000 (d) ₹ 28,000
 (e) None of these
35. A tap can fill an empty tank in 12 hours and a leakage can empty the whole tank in 20 hours. If the tap and the leakage are working simultaneously, how long will it take to fill the whole tank?
 (a) 25 hours (b) 40 hours
 (c) 30 hours (d) 35 hours
 (e) None of these

REASONING ABILITY

36. Which is the third number to the left of the number which is exactly in the middle of the following sequence of numbers?
 1 2 3 4 5 6 7 8 9 2 4 6 8 9 7 5 3 9 8 7 6 4 3 2 1
 (a) 3 (b) 2
 (c) 5 (d) 6
 (e) None of these
37. In a certain code IDEAS is written as HEDBR and WOULD is written as VPTMC. How will RIGHT be written in the same code?
 (a) QJHIS (b) QJFGS
 (c) SHHGU (d) QJFIU
 (e) QJFIS
38. If the alphabet is written in the reverse order and every alternate letter starting with Y is dropped, which letter will be exactly in the middle of the remaining letters of the alphabet.
 (a) M (b) N
 (c) O (d) M or O
 (e) None of these
39. In a row of girls, Rita and Monika occupy the ninth place from the right end and tenth place from the left end, respectively. If they interchange their places, then Rita and Monika occupy seventeenth place from the right and eighteenth place from the left respectively. How many girls are there in the row?
 (a) 25 (b) 26
 (c) 27 (d) Data inadequate
 (e) None of these
40. In a certain code language 'Ka Bi Pu Ya' means 'You are very intelligent'; 'Ya Lo Ka Wo' means 'They seem very intelligent'; 'La Pu Le' means 'You can see' and 'Sun Pun Yun Ya' means 'how intelligent she is', In that language, which of the following words means 'are'?
 (a) Ka (b) Bi
 (c) Ya (d) Pu
 (e) None of these
41. Ankit is related to Binny and Chinky, Daizy is Chinky's mother. Also Daizy is Binny's sister and Aruna is Binny's sister. How is Chinky related to Aruna?
 (a) Niece (b) Sister
 (c) Cousin (d) Aunt
 (e) None of these

42. Rama remembers that she met her brother on Saturday, which was after the 20th day of a particular month. If the 1st day of that month was Tuesday, then on which date did Rama meet her brother ?
 (a) 24th (b) 23rd
 (c) 25th (d) 26th
 (e) None of these
43. If it is possible to make only one such number with the first, the fourth and the sixth digits of the number 531697 which is the perfect square of a two digit even number, which of the following will be the second digit of the two digit even number. If no such number can be made, give '@' as the answer and if more than one such number can be made, give '©' as the answer.
 (a) 4 (b) 2
 (c) 6 (d) @
 (e) ©
44. In a certain code JOURNEY is written as TNISZFO. How is MEDICAL written in that code?
 (a) CDLJMBD (b) CDWDBM
 (c) LDCJMBD (d) EFNJMBD
 (e) None of these
45. If 'K' denotes '×', 'B' denotes '÷', 'T' denotes '-' and 'M' denotes '+', then –
 40 B 8 T 6 M 3 K 4 = ?
 (a) 19 (b) 11
 (c) -31 (d) 23
 (e) None of these
48. **Statements:** All stones are rocks.
 Some rocks are bricks.
 Some bricks are cement.
Conclusions: I. Some cements are rocks.
 II. Some bricks are stone
 III. Some stones are cement.
 (a) Only I and either II or III follow
 (b) Only either II or III follows
 (c) Only I and II follow
 (d) All follow
 (e) None of these
49. **Statements:** All flats are buildings.
 All buildings are bungalows.
 All bungalows are apartments.
Conclusions: I. Some apartments are flats.
 II. All flats are bungalows.
 III. Some bungalows are flats
 (a) None follows
 (b) Only I and II follow
 (c) Only II and III follow
 (d) Only I and III follow
 (e) All I, II and III follow
50. **Statements:** Some spectacles are lenses.
 Some lenses are frames.
 All frames are metals.
Conclusions: I. Some lenses are metals
 II. Some metals are spectacles.
 III. Some frames are spectacles.
 (a) Only III follows
 (b) Only I follows
 (c) Only I and either II or III follow
 (d) Only I and II follow
 (e) None of these

DIRECTIONS (Qs. 46-50): In each question below are three statements followed by three conclusions numbered I, II and III. You have to take the three given statements to be true even if they seem to be at variance from commonly known facts and then decide which of the answers (a), (b), (c), (d) and (e) is the correct answer and indicate it on the answer sheet.

46. **Statements:** Some chairs are tables.
 Some tables are drawers.
 all drawers are shelf.
Conclusions: I. Some shelves are tables.
 II. Some drawers are chairs.
 III. Some shelves are drawers.
 (a) Only I and III follow
 (b) Only I and either II or III follow
 (c) Only II and either I or III follow
 (d) All I, II and III follow
 (e) None of these
47. **Statements:** All trees are flowers.
 Some flowers are leaves.
 No leaf is bud
Conclusions: I. No bud is a flower.
 II. Some buds are flowers.
 III. Some leaves are trees.
 (a) Only II and III follow
 (b) Only III follows
 (c) Only either I or II follows
 (d) Either I or II and III follow
 (e) None of these

DIRECTIONS (Qs. 51 - 55): Read the following information carefully and answer the questions that follow:

At a party, A, B, C, D and E are sitting in a circle. The group comprises a professor, an industrialist and a businessman. The businessman is sitting in between the industrialist and his wife D. A, the professor is married to E, who is the sister of B. The industrialist is seated to the right of C. Both the ladies are unemployed.

51. What is A to B ?
 (a) Brother (b) Uncle
 (c) Brother-in-law (d) Can't be determined
 (e) None of these
52. A is sitting to the right of
 (a) the industrialist (b) his wife
 (c) D (d) Can't be determined
 (e) None of these
53. Who is the industrialist ?
 (a) D (b) A
 (c) B (d) Can't be determined
 (e) None of these

54. Who in the group is unmarried?
 (a) Professor (b) Industrialist
 (c) Businessman (d) Can't be determined
 (e) None of these
55. Who among them must be graduate ?
 (a) B (b) A
 (c) C (d) E
 (e) None of these

DIRECTIONS (Qs. 56-60): In the questions given below, certain symbols are used with the following meanings:

- A @ B means A is greater than B.
 A * B means A is either greater than or equal to B.
 A # B means A is equal to B.
 A \$ B means A is either smaller than or equal to B.
 A + B means A is smaller than B.

Now in each of the following questions, assuming the given statements to be true, find which of the two conclusions I and II given below them is/are definitely true?

- (a) If only conclusion I is true
 (b) If only conclusion II is true
 (c) If either conclusion I or II is true
 (d) If neither conclusion I nor II is true
 (e) If both conclusions I and II are true
56. **Statements** : B + D; E\$T; T * P; P@B
Conclusions : I. P\$D
 II. P@D
57. **Statements** : E * F; G\$H; H#E; G@K
Conclusions : I. H@K
 II. H * F
58. **Statements** : P\$Q; N#M; M@R; R * P
Conclusions : I. P + N
 II. Q\$M
59. **Statements** : D + T; E \$V; F * T; E@D
Conclusions : I. D\$V
 II. D + F
60. **Statements** : T * U; U\$W; V@L; W + V
Conclusions : I. V@T
 II. L#W

DIRECTIONS (Qs. 61-65): Use the following series of elements (alpha-number-symbol) to answer these questions. Every two-digit number (given in brackets) is to be treated as single number.

2 ★ 8 5 6 B 9 \$ Q 3 E 1 7 R D 4 £ (13) U ● K (18) A (14) P

61. Four of the following five groups of elements are alike in a certain way and so form a group. Which is the one the **does not** belong to that group ?
 (a) 2 ★ 8 (b) 5 6 B
 (c) Q \$ 9 (d) 1 3 E
 (e) D R 7
62. If each alphabet has a value of zero, each symbol (i.e., ★, \$ and ●) has a value equivalent to the square of the numeral that immediately precedes the symbol or the value of 1 if it is not immediately preceded by a numeral, what will be the sum of the values of the first 10 elements of the series starting from the left end ?
 (a) 118 (b) 46
 (c) 79 (d) 107
 (e) None of these
63. If each of the letters in the above series of elements is given a value equivalent to its serial number in the English alphabet, what will be the difference between the sum of the consonants and the sum of the vowels used in the series ?
 (a) 109 (b) 41
 (c) 82 (d) 27
 (e) None of these
64. Which of the following groups of elements will come in the place of the question-mark in the series of elements given below?
 6 8 2 \$ B 5 E Q 9 ? £ D 7
 (a) ● (13) 4 (b) 4 (13) ●
 (c) U £ D (d) ● (13) £
 (e) None of these
65. BQ in the above series is related in ER in a similar way as AP is related to
 (a) RD (b) U ●
 (c) KA (d) Q 3
 (e) 6B

DIRECTIONS (Qs. 66-70) : Study the following information carefully to answer these questions.

A group of people has six family members and an advocate. These are L, M, N, O, P, Q and R and having different professions. Each one of them is a journalist, businessman, architect, doctor and pilot but not necessarily in this order. There are three males and three females in the family out of which there are two married couples. M is a businessman and is the father of P. N is a housewife and is daughter-in-law of O. L is neither a pilot nor a journalist. R is an advocate. N is not the mother of P and O is not married to M. No lady is a journalist.

66. Which of the following groups represents the three ladies in the group ?
 (a) N, P, L (b) P, L, N
 (c) L, N, O (d) O, P, L
 (e) None of these
67. Who is married to Q ?
 (a) N (b) O
 (c) L (d) Can't be determined
 (e) None of these
68. Who among the following family members is an architect ?
 (a) L (b) O
 (c) P (d) Can't be determined
 (e) None of these
69. Which of the following is the profession of P ?
 (a) Architect (b) Pilot
 (c) Architect or pilot (d) Journalist
 (e) None of these
70. How is Q related to O ?
 (a) Father (b) Mother
 (c) Mother-in-law (d) Son - in - law
 (e) None of these

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-80): Read the following passage carefully and answer the questions given below it.

Long ago there was a poor Brahmin named Krishnan. He could not find enough work to do. Sometimes, he and his family had to go without food. At last Krishnan decided to leave his village in search of work. Early next morning, he left the house. He walked the whole day until he came to a thick jungle. He was tired, thirsty and hungry. While looking around for water to drink, he found a well. He went to the well and looked in. There he saw a jaguar, a monkey, a snake and a man. They had all fallen into the well. "O, noble Brahmin", the jaguar called out to him, "Please help me out, so that I can go back to my family."

"But you are a jaguar", said Krishnan. "How do I know you will not kill me?" "Don't be afraid of me, I promise I will not do you any harm", replied the jaguar. Krishnan reached into the well and pulled out the jaguar. The jaguar thanked him and said, "I'm Shersingh. I live in a cave in the mountains. I shall be most delighted if I can repay my debt to you someday." Krishnan then heard the monkey calling out to him from the well. The Brahmin at once pulled the monkey out. The monkey thanked the Brahmin. "If you are ever in need of food, just drop in at my place below that big mountain. Bali is my name." Now the snake called out to him for help. "Help you!" exclaimed Krishnan. "You are a snake. What if you bite me?" "I shall never bite you", said the snake. So Krishnan pulled the snake out of the well. The snake said, "Remember, if you are ever in any difficulty, just call out my name-Naagesh, and wherever you are, I shall find you." The jaguar, the monkey and the snake took leave of the Brahmin. But before they left, they spoke to him about the man in the well. "Please do not help him," said Shersingh. "If you do", said Naagesh, "you will be in trouble yourself." As soon as they left, the man in the well began to call out for help. Krishnan felt sorry for the man and pulled him out of the well. "Thank you for your kindness", said the man. "I am Seth Ghanshyamdas. I am a goldsmith. If you ever need my help, don't hesitate to visit my humble house near the city." The goldsmith then left for home.

After some time, the Brahmin continued his journey. But he could not find any work. He then remembered Shersingh, Bali, Naagesh and Seth Ghanshyamdas. He thought it was time to seek their help. He first went to Bali. The monkey was overjoyed to see him. He gave him a warm welcome and offered him some really delicious fruits. The Brahmin told him how grateful he was. Now Krishnan went to see Shersingh, the jaguar. As soon as Shersingh saw Krishnan coming, he ran out to welcome him. He gave Krishnan a beautiful gold necklace and other precious jewellery. Krishnan thanked Shersingh for the jewellery and departed. His journey had at last brought him luck, he thought. He would be able to sell the ornaments for a good price. But who could help him to sell the ornaments? He then remembered Seth Ghanshyamdas. He went to him. The goldsmith was glad to see Krishnan. "I have come to ask for your help", said Krishnan. "Here are some ornaments. Please give me a good price for them." Seth Ghanshyamdas took the jewellery and examined it carefully. "I shall certainly help you", he said. "But let me show them to another goldsmith. Please wait here, I will be right back." He then went out with the ornaments. Seth at once rushed to the Palace of the King. He said, "A man brought these ornaments to me and asked me to sell them. But they are the ornaments I made for the Prince who is missing." "Who is this man? Where is he?", thundered the King.

This rogue must have murdered my little Prince and robbed his jewels!" "He is a Brahmin named Krishnan, your Majesty", replied the goldsmith, and he is there, in my house. The king called for his most dreaded soldiers. "Arrest the Brahmin who is in the goldsmith's house and throw him into the darkest dungeons of the kingdom", roared the King. The King's guard stormed into the goldsmith's house and seized Krishnan. Krishnan was thrown into a dark dungeon to await his execution. He then remembered the words of Naagesh, the snake. So he called out to him.

Suddenly, almost like magic, Naagesh slithered his way down a narrow window into the dingy cell. "O, Lord!" hissed Naagesh, "how did you manage to get yourself arrested?" Krishnan cried and then told the snake what had happened. "I have a plan", hissed Naagesh. "I shall creep into the Queen's room and bite her", said Naagesh. "She will faint. No matter what they do, she will remain asleep. The poison will remain in her body until you place your hand on her forehead", explained Naagesh. He then left Krishnan and went to the palace. He crept into the Queen's room and bit her. The Queen fainted. The sad news that the Queen had been bitten by a snake spread all over the Kingdom. Vaidyas came from far and near, but their medicines had no effect. No one could revive the Queen. Finally, the King declared that anyone who could cure the Queen would be handsomely rewarded. Many people went to the palace but all of them failed. "I can cure the Queen", Krishnan told the guards. At once they took him to the Queen. Krishnan sat beside the Queen and placed his hand on her forehead. Soon, she opened her eyes and sat up. The King was overjoyed and shed tears of happiness. He embraced Krishnan and thanked him. "Your Majesty", said Krishnan. "I was sent to prison for a crime I did not commit." Krishnan told the King the whole story. The King was fuming with rage when he heard what the goldsmith had done. He at once had the goldsmith arrested. The King then presented Krishnan with a large house and a thousand pieces of gold. Krishnan sent for his family and they all lived happily ever after.

71. Why did Krishnan decide to leave his village?
- As he could not find much work in his own village and his family had to starve sometimes because of it.
 - As his family had requested him to do so.
 - As his village people had asked him to leave their village and look for work somewhere else.
 - As he wanted to search for food in a village different from his own.
 - None of the above
72. Why did the jaguar, the monkey and the snake tell Krishnan not to save the man in the well?
- As the man in the well was a goldsmith
 - As the man in the well had cheated the snake, the monkey and the jaguar
 - As the man in the well was a thief
 - As the snake, the monkey and the jaguar hated the man as they had known him for a very long time
 - None of the above
73. Why was Krishnan afraid to save Naagesh from the well?
- As Naagesh had threatened him with dire consequences.
 - As he thought Naagesh would eat him.
 - As he thought Naagesh would bite him once he was out of the well.
 - As he thought that Naagesh would capture him as soon as he got out of the well.
 - None of the above.

74. Why did Krishnan go to meet Seth Ghanshyamdas?
 (a) As he thought that Seth Ghanshyamdas could help him in selling the ornaments gifted to him by Shersingh.
 (b) As he knew that Seth Ghanshyamdas had contact with the King which could prove to be beneficial.
 (c) As Seth Ghanshyamdas had requested Krishnan to sell ornaments only to him
 (d) As Krishnan was extremely fond of Seth Ghanshyamdas
 (e) None of the above.
75. What did Bali do after seeing Krishnan at his house?
 (1) He gave Krishnan directions to Shersingh's house.
 (2) He welcomed Krishnan to his house.
 (3) He offered tasty fruits to Krishnan.
 (a) Only 1 (b) Only 2
 (c) Only 3 (d) Only 2 and 3
 (e) 1 and 3
76. What plan did Naagesh have to save Krishnan from the dungeon?
 (a) That he would sneak Krishnan out of the dungeon without anyone noticing
 (b) That he would bite the King and make him unconscious
 (c) That he would bite Krishnan and make everyone believe that he was dead
 (d) That he would enter the Queen's chamber and scare her
 (e) None of the above
77. What did Seth Ghanshyamdas tell the King about Krishnan?
 (a) That Krishnan had brought fake ornaments for selling
 (b) That Krishnan was an honest Brahmin who had left his village
 (c) That Krishnan had killed the Prince
 (d) That Krishnan had brought those ornaments for selling which had been made for the missing Prince
 (e) None of the above
78. What did the King do on learning the truth about Krishnan and Seth Ghanshyamdas?
 (a) He put Krishnan back in the dungeon as he still held Krishnan responsible for the Prince's death
 (b) He called for Krishnan's wife and family
 (c) He presented gold to Krishnan and also a house to live in
 (d) He congratulated the snake on his efforts to save Krishnan
 (e) None of the above
79. What did the King do to save the Queen after even the Vaidyas failed to revive her?
 (a) He punished the snake for having harmed the Queen
 (b) He announced a reward to anyone who could cure the Queen
 (c) He immediately called for Krishnan to cure the Queen
 (d) He asked his guards to immediately look for someone who could cure the Queen
 (e) None of the above
80. What can possibly be the moral of the story?
 (a) Trust oneself before trusting others
 (b) A good deed never goes in vain
 (c) You cannot change people but you can change yourself
 (d) Try and try until you succeed
 (e) One must be the change one wishes to see in this world

DIRECTIONS (Qs. 81-85): In each question below, a sentence with four words printed in bold type is given. These are numbered as (a), (b), (c) and (d). One of these four words printed in bold may

be either wrongly spelt or inappropriate in the context of the sentence. Find out the word which is wrongly spelt or inappropriate, if any. The number of that word is your answer. If all the words printed in bold are correctly spelt and also appropriate in the context of the sentence, mark (e) i.e. 'All correct' as your answer.

81. The whole (a)/ time she walked with her child in her arms, the only **thing** (b)/ that **worried** (c)/ her was her son's **feature**. (d)/ All correct (e)
82. When the young artist **returned** (a)/ to his village, his family held a **festive** (b)/ dinner on its lawn to celebrate his **triumphant** (c)/ **homecoming**. (d)/ All correct (e)
83. Had she not **suppressed** (a)/ all the details of her Company's **project** (b)/ her Company would have **bagged** (c)/ **the contract**. (d)/ All correct (e)
84. She trusted Mira with all her **heart** (a)/ and thus **handled** (b)/ over her **life's** (c)/ savings to her **instantly**. (d)/ All correct (e).
85. It is **difficultt** (a)/ to see the **picture** (b)/ when you are **inside** (c)/ the **frame**. (d)/ All correct (e)

DIRECTIONS (Qs. 86-95): In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

One day a father of a very wealthy family (86) his son on a trip to the country with the purpose of (87) his son how the poor people live so he could be thankful for his wealth. They spent a (88) of days and nights on the farm of what would be considered a (89) poor family. On their (90) from the trip, the father asked his son, "How was the trip?" "It was great, Dad." "Did you see how poor people can be?", the father asked. "Oh yeah", said the son. So what did you (91) from the trip?", asked the father. The son answered, "I saw that we have one dog and they had four. We have a pool that (92) in the middle of our garden and they have a creek that has no end." "We have imported lanterns in our garden and they have the stars at night." "Our patio reaches to the front yard and they have the (93) horizon." "we have a small piece of land to live on and they have fields that go beyond our sight." "We have (94) who serve us, but they serve others." "We buy our food, but they grow theirs." "We have walls around our (95) to protect us; they have friends to protect them."

With this the boy's father was speechless. Then his son added, "Thanks dad for showing me how poor we are".

86. (a) took (b) beat
 (c) drag (d) mould
 (e) showed
87. (a) presenting (b) requesting
 (c) tell (d) trusting
 (e) showing
88. (a) two (b) couple
 (c) much (d) few
 (e) many
89. (a) major (b) some
 (c) sorrow (d) very
 (e) astutely
90. (a) lane (b) journey
 (c) leave (d) return
 (e) walking

91. (a) reveal (b) think
(c) saw (d) believe
(e) learn
92. (a) stands (b) reaches
(c) swims (d) leak
(e) watery
93. (a) more (b) scene
(c) whole (d) last
(e) lucky
94. (a) servants (b) mother
(c) computers (d) relatives
(e) man
95. (a) minds (b) selves
(c) property (d) pillars
(e) country
97. As a politician he is used to being **in the limelight** all the time.
(a) giving speeches
(b) the object of admiration
(c) the centre of attraction
(d) an object of public notice
(e) None of these
98. I **ran out of** money on my European tour.
(a) exhausted my stock of (b) did not have enough
(c) lost (d) carried a lot
(e) None of these
99. Madhuri might **scream blue murder**, but I feel Deepali should get the promotion since she is better qualified for the job.
(a) someone has been murdered with some blue liquid
(b) someone is being murdered and has become blue
(c) suffer from persecution complex
(d) make a great deal of noise and object vehemently
(e) None of these
100. In modern democratic societies **lynch law** seems to have become the spheres of life.
(a) law of the mob (b) law of the underworld
(c) law of the constitution (d) law of the parliament
(e) None of these

DIRECTIONS (Qs. 96 - 100): In each of the following sentences, an idiomatic expression or a proverb is highlighted. Select the alternative which best describes its use in the sentence.

96. He resigned the post of his **own accord**.
(a) which he liked
(b) according to his convenience
(c) voluntarily and willingly
(d) according to his judgement
(e) None of these

RESPONSE SHEET

- | | | | | |
|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|
| 1. (a) (b) (c) (d) (e) | 2. (a) (b) (c) (d) (e) | 3. (a) (b) (c) (d) (e) | 4. (a) (b) (c) (d) (e) | 5. (a) (b) (c) (d) (e) |
| 6. (a) (b) (c) (d) (e) | 7. (a) (b) (c) (d) (e) | 8. (a) (b) (c) (d) (e) | 9. (a) (b) (c) (d) (e) | 10. (a) (b) (c) (d) (e) |
| 11. (a) (b) (c) (d) (e) | 12. (a) (b) (c) (d) (e) | 13. (a) (b) (c) (d) (e) | 14. (a) (b) (c) (d) (e) | 15. (a) (b) (c) (d) (e) |
| 16. (a) (b) (c) (d) (e) | 17. (a) (b) (c) (d) (e) | 18. (a) (b) (c) (d) (e) | 19. (a) (b) (c) (d) (e) | 20. (a) (b) (c) (d) (e) |
| 21. (a) (b) (c) (d) (e) | 22. (a) (b) (c) (d) (e) | 23. (a) (b) (c) (d) (e) | 24. (a) (b) (c) (d) (e) | 25. (a) (b) (c) (d) (e) |
| 26. (a) (b) (c) (d) (e) | 27. (a) (b) (c) (d) (e) | 28. (a) (b) (c) (d) (e) | 29. (a) (b) (c) (d) (e) | 30. (a) (b) (c) (d) (e) |
| 31. (a) (b) (c) (d) (e) | 32. (a) (b) (c) (d) (e) | 33. (a) (b) (c) (d) (e) | 34. (a) (b) (c) (d) (e) | 35. (a) (b) (c) (d) (e) |
| 36. (a) (b) (c) (d) (e) | 37. (a) (b) (c) (d) (e) | 38. (a) (b) (c) (d) (e) | 39. (a) (b) (c) (d) (e) | 40. (a) (b) (c) (d) (e) |
| 41. (a) (b) (c) (d) (e) | 42. (a) (b) (c) (d) (e) | 43. (a) (b) (c) (d) (e) | 44. (a) (b) (c) (d) (e) | 45. (a) (b) (c) (d) (e) |
| 46. (a) (b) (c) (d) (e) | 47. (a) (b) (c) (d) (e) | 48. (a) (b) (c) (d) (e) | 49. (a) (b) (c) (d) (e) | 50. (a) (b) (c) (d) (e) |
| 51. (a) (b) (c) (d) (e) | 52. (a) (b) (c) (d) (e) | 53. (a) (b) (c) (d) (e) | 54. (a) (b) (c) (d) (e) | 55. (a) (b) (c) (d) (e) |
| 56. (a) (b) (c) (d) (e) | 57. (a) (b) (c) (d) (e) | 58. (a) (b) (c) (d) (e) | 59. (a) (b) (c) (d) (e) | 60. (a) (b) (c) (d) (e) |
| 61. (a) (b) (c) (d) (e) | 62. (a) (b) (c) (d) (e) | 63. (a) (b) (c) (d) (e) | 64. (a) (b) (c) (d) (e) | 65. (a) (b) (c) (d) (e) |
| 66. (a) (b) (c) (d) (e) | 67. (a) (b) (c) (d) (e) | 68. (a) (b) (c) (d) (e) | 69. (a) (b) (c) (d) (e) | 70. (a) (b) (c) (d) (e) |
| 71. (a) (b) (c) (d) (e) | 72. (a) (b) (c) (d) (e) | 73. (a) (b) (c) (d) (e) | 74. (a) (b) (c) (d) (e) | 75. (a) (b) (c) (d) (e) |
| 76. (a) (b) (c) (d) (e) | 77. (a) (b) (c) (d) (e) | 78. (a) (b) (c) (d) (e) | 79. (a) (b) (c) (d) (e) | 80. (a) (b) (c) (d) (e) |
| 81. (a) (b) (c) (d) (e) | 82. (a) (b) (c) (d) (e) | 83. (a) (b) (c) (d) (e) | 84. (a) (b) (c) (d) (e) | 85. (a) (b) (c) (d) (e) |
| 86. (a) (b) (c) (d) (e) | 87. (a) (b) (c) (d) (e) | 88. (a) (b) (c) (d) (e) | 89. (a) (b) (c) (d) (e) | 90. (a) (b) (c) (d) (e) |
| 91. (a) (b) (c) (d) (e) | 92. (a) (b) (c) (d) (e) | 93. (a) (b) (c) (d) (e) | 94. (a) (b) (c) (d) (e) | 95. (a) (b) (c) (d) (e) |
| 96. (a) (b) (c) (d) (e) | 97. (a) (b) (c) (d) (e) | 98. (a) (b) (c) (d) (e) | 99. (a) (b) (c) (d) (e) | 100. (a) (b) (c) (d) (e) |

Answer Key

1	(c)	11	(d)	21	(b)	31	(c)	41	(a)	51	(c)	61	(d)	71	(a)	81	(d)	91	(e)
2	(b)	12	(a)	22	(d)	32	(b)	42	(d)	52	(d)	62	(a)	72	(e)	82	(c)	92	(a)
3	(c)	13	(d)	23	(c)	33	(d)	43	(a)	53	(c)	63	(b)	73	(c)	83	(a)	93	(c)
4	(d)	14	(c)	24	(a)	34	(b)	44	(a)	54	(d)	64	(e)	74	(a)	84	(b)	94	(a)
5	(d)	15	(b)	25	(c)	35	(c)	45	(b)	55	(b)	65	(c)	75	(d)	85	(a)	95	(c)
6	(c)	16	(b)	26	(d)	36	(b)	46	(a)	56	(c)	66	(c)	76	(e)	86	(a)	96	(c)
7	(d)	17	(a)	27	(b)	37	(e)	47	(c)	57	(e)	67	(b)	77	(d)	87	(e)	97	(c)
8	(d)	18	(a)	28	(e)	38	(b)	48	(e)	58	(a)	68	(a)	78	(c)	88	(b)	98	(a)
9	(a)	19	(a)	29	(a)	39	(b)	49	(e)	59	(b)	69	(d)	79	(b)	89	(d)	99	(d)
10	(b)	20	(c)	30	(a)	40	(b)	50	(b)	60	(d)	70	(e)	80	(b)	90	(d)	100	(a)

Answers & Explanations

1. (c) Given Expression = $\frac{(a^3 - b^3)}{(a^2 + ab + b^2)}$,
where $a = 117, b = 98$
$$= \frac{(a-b)(a^2 + ab + b^2)}{(a^2 + ab + b^2)} = (a-b) = (117-98) = 19.$$
2. (b) Dividing numerator as well as denominator by b , we get:
$$\frac{3a+2b}{3a-2b} = \frac{3 \times \frac{a}{b} + 2}{3 \times \frac{a}{b} - 2} = \frac{3 \times \frac{4}{3} + 2}{3 \times \frac{4}{3} - 2} = \frac{4+2}{4-2} = 3$$
3. (c) Let $\sqrt{\frac{x}{196}} = \frac{72}{56} = \frac{9}{7}$.
Then, $\frac{x}{196} = \frac{9}{7} \times \frac{9}{7} = \frac{81}{49}$. So, $x = \frac{81 \times 196}{49} = 324$.
4. (d) Let $\frac{17.28 \div x}{3.6 \times 0.2} = 200$. Then, $\frac{17.28}{x} = 200 \times 3.6 \times 0.2$
$$\therefore x = \frac{17.28}{200 \times 3.6 \times 0.2} = \frac{1728}{200 \times 36 \times 2} = 0.12$$
5. (d) Given Expression = $\frac{(a-b)^2 + (a+b)^2}{(a^2 + b^2)} = \frac{2(a^2 + b^2)}{(a^2 + b^2)} = 2$
6. (c) Given Expression = $\frac{240 \times 300}{240} = 300$
7. (d) Let $\frac{50}{x} = \frac{x}{\left(\frac{25}{2}\right)}$ or $x^2 = 50 \times \frac{25}{2} = 625$.
$$\therefore x = \sqrt{625} = 25.$$
8. (d) Given Expression = $\left(\frac{112}{14} \times \frac{24}{12} \times \frac{16}{8}\right) = 32$
9. (a) Let $\frac{x}{\sqrt{225}} = 550$. Then, $\frac{x}{15} = 550$
$$\therefore x = (550 \times 15) = \left(\frac{550 \times 15}{10}\right) = 825$$
10. (b) $\frac{(\sqrt{5} - \sqrt{3})}{(\sqrt{5} + \sqrt{3})} = \frac{(\sqrt{5} - \sqrt{3})}{(\sqrt{5} + \sqrt{3})} \times \frac{(\sqrt{5} - \sqrt{3})}{(\sqrt{5} - \sqrt{3})} = \frac{(\sqrt{5} - \sqrt{3})^2}{(5-3)}$
$$= \frac{5+3-2\sqrt{15}}{2} = \frac{2(4-\sqrt{15})}{2} = (4-\sqrt{15})$$
11. (d) Population of village B in 1995 = $5000 \times \frac{16}{13} \approx 6150$
Population of village B in 1996 = $6150 \times \frac{110}{100} = 6750$
Population below poverty line = 52% of 6750 ≈ 3500
12. (a) Population of village D in 1995 = $9,000 \times \frac{17}{15} = 10,200$
Population of village D in 1997 = $10,200 \times \frac{110}{100} = 11,220$
Population of village G in 1997 = $9,000 \times \frac{95}{100} = 8,550$
$$\therefore \text{Total population of village D and G in 1997} = 11,220 + 8,550 = 19,770$$
13. (d) Population of village F below poverty line
$$= 55000 \times \frac{13}{100} \times \frac{49}{100} \approx 3500$$
14. (c) Population of village F in 1995
$$= 1520 \times \frac{100}{38} \times \frac{13}{8} = 6500$$

15. (b) Population of village C below poverty line

$$= 2000 \times \frac{38}{100} = 760$$

Population of village E below poverty line

$$= \frac{2000}{8} \times 18 \times \left(\frac{46}{100}\right) = 2070$$

$$\therefore \text{Required ratio} = \frac{760}{2070} = 76 : 207$$

16. (b) Speed of the train = 132 km/h = $\frac{132 \times 5}{18}$ m/s

Distance = (110 + 165) = 275 m

Time required to cross the railway platform

$$= \frac{275 \times 18}{132 \times 5} = 7.5 \text{ s}$$

17. (a) 15 W = 10 M

$$\text{Now, } 5W + 4M = 5W + \frac{4 \times 15}{10} W = 5W + 6W$$

$$= 11W$$

Now, 15 women can complete the project in 55 days, then 11 women can complete the same project in

$$\frac{55 \times 15}{11} = 75 \text{ days}$$

18. (a) Let the present ages of Ashu's mother and that of Ashu be x and y , respectively.

$$\text{Then, } (x-5) = 3(y-5) \text{ or } x-5 = 3y-15$$

$$\text{or } x-3y = -10$$

$$\text{and } (x+5) = 2(y+5) \dots(i)$$

$$\text{And } x+5 = 2y+10 \text{ or } x-2y = 5 \dots(ii)$$

From (i) and (ii), we have $x = 35$ and $y = 15$

Hence, the present age of Ashu = 15 years

19. (a) Volume of the conical flask = Volume of the cylindrical flask upto the required height (x) cm

$$\frac{1}{3} \pi a^2 h = \pi b^2 \times x \Rightarrow x = \frac{ha^2}{3b^2} \text{ cm}$$

20. (c) Let the sum = Rs. x and original rate = $y\%$ per annum then, New rate = $(y+3)\%$ per annum

$$\therefore \frac{x \times (y+3) \times 2}{100} - \frac{x \times y \times 2}{100} = 300$$

$$xy + 3x - xy = 15000$$

$$\therefore x = 5000 \quad \text{Thus, the sum} = ₹ 5000$$

21. (b)

22. (d)

23. (c)

24. (a) The succeeding numbers are obtained by dividing the preceding numbers by 4. Therefore, the number 386 does not fit in the series and must be replaced by 384.

25. (c) There are two series in the given series :

I

II

Hence the wrong term is 40.

26. (d) $? = \sqrt{45689} = 213.75 \approx 210$

27. (b) $? = \frac{(10008.99)^2}{10009.001} \times \sqrt{3589} \times 0.4987$

$$= (10009)^2 \times \sqrt{3600} = 0.50$$

$$= 10009 \times 60 \times 0.50 \approx 300000$$

28. (e) $? = 399.9 + 206 \times 11.009$

$$= 400 + (200 + 6) \times 11 = 400 + 2200 + 66 = 2670$$

29. (a) $? = \frac{2}{5} + \frac{7}{8} \times \frac{17}{19} \div \frac{6}{5} = \frac{2}{5} + \frac{7}{8} \times \frac{17}{19} \times \frac{5}{6}$

$$= \frac{2}{5} + \frac{595}{912} = 0.40 + 0.65 \approx 1.05 \approx 1$$

30. (a) $? = (299.99999)^3 \approx (300)^3 = 27000000$

31. (c) Total amount used for purchasing = ₹ 160. A reduction of 20% in the price means, now a person gets 5/2 kg for ₹ 32 and this is the present price of the sugar.

$$\therefore \text{Present price per kg} = \frac{32}{5} \times 2 = ₹ 12.8$$

Let the original price be ₹ x . Then new price is arrived after reduction of 20% on it.

$$\Rightarrow x \times 0.8 = 12.8 \text{ or } x = ₹ 16.$$

32. (b) Mrs. X spends = ₹ 535

$$\therefore \text{Total cost} = 43 \text{ shirt} + 21 \text{ ties} = 535$$

By hit and trial, S = 10, T = 5

$$\Rightarrow \text{Total cost} = 43 \times 10 + 21 \times 5 = 535$$

Hence, Ratio of shirts to ties = 10 : 5 = 2 : 1

33. (d) Total expense percentage = $(25 + 5 + 15 + 10)\% = 55\%$
Savings % = $100 - 55 = 45\%$

$$\therefore 45 \equiv 22500$$

$$\therefore 100\% \equiv \frac{22500}{45} \times 100 = ₹ 50000$$

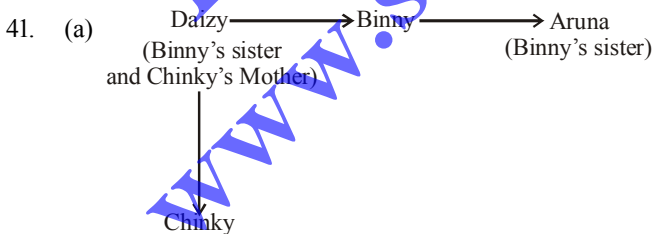
34. (b) Let Anil's salary be ₹ x .
 \therefore Bhuvan's salary = ₹ $\frac{2x}{5}$
 Chandra's salary = ₹ $\frac{2x}{5} \times \frac{7}{9} = \frac{14x}{45}$
 \therefore Anil : Bhuvan : Chandra = $x : \frac{2x}{5} : \frac{14x}{45} = 45 : 18 : 14$

\therefore Bhuvan's salary
 = ₹ $\left[\frac{18}{(45+18+14)} \times 77000 \right] = ₹ 18000$

35. (c) Part of the tank filled in an hour
 $= \frac{1}{12} - \frac{1}{20} = \frac{5-3}{60} = \frac{1}{30}$
 Hence, the tank will be filled in 30 hours
36. (b) There are 25 numbers in the given sequence.
 So, middle number = 13th number = 8.
 Clearly, the third number to the left of this 8 is 2.

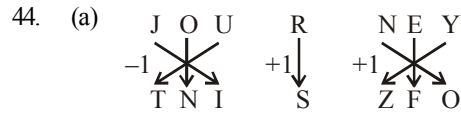
37. (e) Coding for: I D E A S
 $-1\downarrow$ $+1\downarrow$ $-1\downarrow$ $+1\downarrow$ $-1\downarrow$
 H E D B R
- Coding for: W O U L D
 $-1\downarrow$ $+1\downarrow$ $-1\downarrow$ $+1\downarrow$ $-1\downarrow$
 V P T M C
- Similarly, R I G H T
 $-1\downarrow$ $+1\downarrow$ $-1\downarrow$ $+1\downarrow$ $-1\downarrow$
 Q J F I S

38. (b) Cancelling every second letter after reversing the alphabet the series becomes.
 Z X V T R P N L J H F D B
 The middle letter is N.
39. (b) Total no. of girls = $17 + 10 - 1$ or $18 + 9 - 1 = 26$.
40. (b) From first 2 sentences 'Ka Ya' means 'very intelligent'.
 From 1st and 3rd sentences 'Pu' means 'you'
 \therefore In first sentence 'are' means 'Bi'

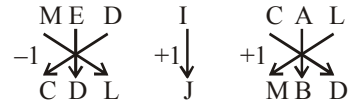


42. (d) 1st of month was Tuesday, hence the date on first Saturday was 5th.
 Hence the other Saturdays of the month are 12, 19, 26. Rama met her brother on 26th.

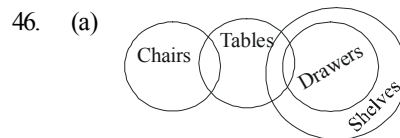
43. (a) $\boxed{5} 3 1 \boxed{6} 9 \boxed{7}$
 $576 = 24 \times 24$



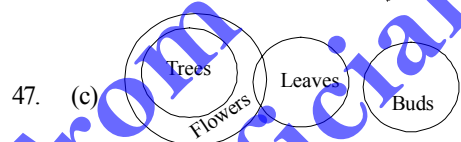
Similarly,



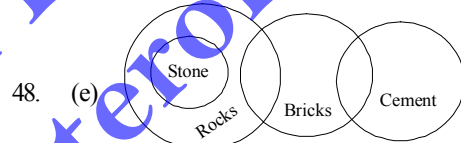
45. (b) $40 B 8 T 6 M 3 K 4 = ?$
 $\Rightarrow ? = 40 + 8 - 6 + 3 \times 4$
 $\Rightarrow ? = 5 + 6 - 12 = 11$



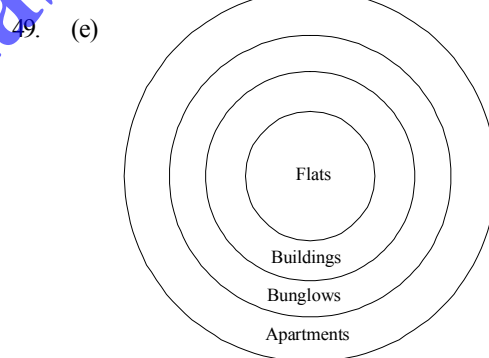
Hence conclusions I. II. III.



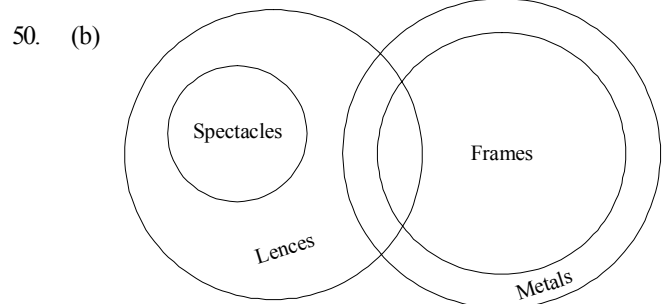
Hence conclusions I. II. III.
 But I and II are complementary pairs.



Hence conclusions I. II. III.

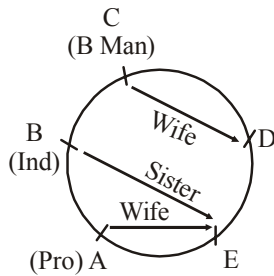


Hence conclusions I. II. III.



Hence conclusions I. II. III.

For (Qs. 51 to 55)



A, the professor is married to E and E is the sister of B. The wife of the industrialist is D. The industrialist is seated to the right of C. Thus, A and C cannot be industrialists. Therefore, B is the industrialist and C is the business man. Now, we come to the following deductions :

- A – Professor B – Industrialist
- C – Businessman D – Female, hence unemployed
- E – Female, hence unemployed

51. (c) A is the husband of E and E is the sister of B. Hence, A is the brother-in-law of B.
52. (d) It cannot be determined, as no information has been provided in the paragraph about the sitting position of A.
53. (c) As deduced earlier, B is the industrialist.
54. (d) It cannot be determined whether the businessman is married or unmarried.
55. (b) As A is a professor, he must be a graduate.
56. (c) $B < D \dots(i), E \leq T \dots(ii), T \geq P \dots(iii), P > B \dots(iv)$ From (i) and (iv), we get, $P > B < D \Rightarrow$ no conclusion. But the exhaustive possibilities are $P > D, P = D$ and $P < D$. Hence either I or II is true.
57. (e) $E \geq F \dots(i), G \leq H \dots(ii), H = E \dots(iii), G > K \dots(iv)$ From (ii) and (iv), we get, $H \geq G > K \Rightarrow H > K$. Hence I is true. From (i) and (iii), we get, $H = E \geq F \Rightarrow H \geq F$. Hence II is true.
58. (a) $P \leq Q \dots(i), N = M \dots(ii), M > R \dots(iii), R \geq P \dots(iv)$ From (ii), (iii) and (iv), we get, $N = M > R \geq P \Rightarrow N > P$ or $P < N$. Hence I is true. From (ii), (iv) and (i), we get, $M > R \geq P \leq Q \Rightarrow$ No conclusion about the relationship between M and Q can be established.
61. (d) Other groups consist of consecutive elements.
62. (a) $2 + 2^2 + 8 + 5 + 6 + 0 + 9 + 9^2 + 0 + 3 = 118$ Where value of alphabet = 0; symbol = square of the previous number; number = the value itself.
63. (b) The letters used in the series are B Q E R D U K A P. Sum of the positions of consonants according to alphabet = $2 + 17 + 18 + 4 + 11 + 16 = 68$. Similarly, sum of the vowels' positions = $5 + 21 + 1 = 27$. Hence required difference = $68 - 27 = 41$.
64. (e) First element of each group follows the order + 3, + 3, + 3... and so on.

Middle element and last element also follow the same trend. Hence (?) should be replaced by R 13.

65. (c) Number of elements between B and Q is the same as that between E and R. Similarly, number of elements between A and P is the same as that between K and A.

For (Qs. 66 - 70) : The given information can be tabulated as follows

Person	Sex	Relationship	Profession
L	Female	Wife of M	Architect
M	Male	Father of P.	Businessman
		Husband of L.	
		Son of Q and O.	
N	Female	Daughter-in-law of O and Q.	Housewife
O	Female	Wife of Q	Pilot
P	Male	Son of M and L.	Journalist
Q	Male	Grandfather of P.	Doctor
		Husband of O.	
		Father of M.	
R	-	-	Advocate

Two married couples : LM and QO.

71. (a) Refer to the sentence 'He could not find.....in search of work'.
72. (e) Refer to the sentence "Please do not help him".....of the second para of the passage.
73. (c) Refer to the sentence "You are.....bite me?".....of the second para of the passage.
74. (a) Refer to the sentence "He would be.....Ghanshyamdas"of the third para of the passage.
75. (d) Refer to the sentence, "He gave him.....delicious fruits".....of the third para of the passage.
76. (e) Refer to the sentence "I shall creep.....bite her.....hand on her forehead" of the fourth para of the passage.
77. (d) Refer to the sentence, "A man broughtprince who is missing".....of the third para of the passage.
78. (c) Refer to the sentence "He at once.....pieces of gold" of the second last sentence of fourth para of the passage.
79. (b) Refer to the sentence "Finally, the king declared.....handsomely rewarded" of the fourth para of the passage.
80. (b) The moral of the story can possibly be "A good deed never goes in vain".
81. (d) It should be 'here was her son's future'.
82. (c) The correct spelling should be 'triumphant'.
83. (a) The word suppressed should be replaced by revealed or leaked in the sentence.
84. (b) It should be 'handed over' which means the act of moving power or responsibility from one person to another.
85. (a) The correct spelling is difficult.

2

PRACTICE SET

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $\frac{1}{4}$ th of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-10): What will come in place of question mark (?) in the following questions?

- $$\frac{137 \times 137 + 137 \times 133 \times 133 \times 133}{137 \times 137 \times 137 - 133 \times 133 \times 133} = ?$$

(a) 4 (b) 270
(c) $\frac{1}{4}$ (d) $\frac{1}{270}$
(e) None of these
- If $\sqrt{3^n} = 81$, then $n = ?$

(a) 2 (b) 4
(c) 6 (d) 8
(e) None of these
- $$\left[(5\sqrt{7} + \sqrt{7}) + (4\sqrt{7} + 8\sqrt{7}) \right] - (19)^2 = ?$$

(a) 143 (b) $72\sqrt{7}$
(c) 134 (d) $70\sqrt{7}$
(e) None of these
- $$(4444 \div 40) + (645 \div 25) + (3991 \div 26) = ?$$

(a) 280.4 (b) 290.4
(c) 295.4 (d) 285.4
(e) None of these
- $$\frac{.23 - .023}{.0023 \div 23} = ?$$

(a) 0.207 (b) 207
(c) 2070 (d) 0.0207
(e) None of these
- $$\frac{(7+7+7) \div 7}{5+5+5 \div 5} = ?$$

(a) 1 (b) $\frac{1}{5}$
(c) $\frac{15}{11}$ (d) $\frac{3}{11}$
(e) None of these
- $$\sqrt{33124} \times \sqrt{2601} - (83)^2 = (?)^2 + (37)^2$$

(a) 37 (b) 33
(c) 34 (d) 28
(e) None of these
- $$5\frac{17}{37} \times 4\frac{51}{52} \times 11\frac{1}{7} + 2\frac{3}{4} = ?$$

(a) 303.75 (b) 305.75
(c) $303\frac{3}{4}$ (d) $305\frac{1}{4}$
(e) None of these
- $$\frac{\sqrt{32} + \sqrt{48}}{\sqrt{8} + \sqrt{12}} = ?$$

(a) $\sqrt{2}$ (b) 2
(c) 4 (d) 8
(e) None of these

10. $\frac{1}{\sqrt{9}-\sqrt{8}} = ?$
- (a) $\frac{1}{2}(3-2\sqrt{2})$ (b) $\frac{1}{3+2\sqrt{2}}$
 (c) $3-2\sqrt{2}$ (d) $3+2\sqrt{2}$
 (e) None of these
11. If the compound interest on a certain sum of money for 3 years at 10% p.a. be ₹ 993, what would be the simple interest ?
- (a) ₹ 800 (b) ₹ 950
 (c) ₹ 900 (d) ₹ 1000
 (e) None of these
12. In a class, 20 opted for Physics, 17 for Maths, 5 for both and 10 for other subjects. The class contains how many students?
- (a) 35 (b) 42
 (c) 52 (d) 60
 (e) None of these
13. How much water must be added to 100 cc of 80% solution of boric acid to reduce it to a 50% solution ?
- (a) 20 cc (b) 40 cc
 (c) 80 cc (d) 60 cc
 (e) None of these
14. Successive discounts of 20% and 15% are equivalent to a single discount of
- (a) 35% (b) 32%
 (c) 17.5% (d) 22.5%
 (e) None of these
15. The dimensions of a rectangular room when increased by 4 metres are in the ratio of 4 : 3 and when decreased by 4 metres, are in the ratio of 2 : 1. The dimensions of the room are
- (a) 6 m and 4 m
 (b) 12 m and 8 m
 (c) 16 m and 12 m
 (d) 24 m and 16 m
 (e) None of these
16. Two cars start together in the same direction from the same place. The first goes with a uniform speed of 10 km/h. The second goes at a speed of 8 km/h in the first hour and increases its speed by $\frac{1}{2}$ km with each succeeding hour. After how many hours will the second car overtake the first one, if both go non-stop?
- (a) 9 hours (b) 5 hours
 (c) 7 hours (d) 8 hours
 (e) None of these
17. 24 men working 8 hours a day can finish a work in 10 days. Working at the rate of 10 hours a day, the number of men required to finish the same work in 6 days is
- (a) 30 (b) 32
 (c) 34 (d) 36
 (e) None of these
18. The sum of digits of a two digit number is 15. If 9 be added to the number, then the digits are reversed. The number is
- (a) 96. (b) 87
 (c) 78 (d) 69
 (e) None of these
19. Three cubes of a metal are of edges 3 cm, 4 cm and 5 cm. These are melted together and from the melted material, another cube is formed. The edge of this cube is :
- (a) 8 cm (b) 10 cm
 (c) 9 cm (d) 6 cm
 (e) None of these
20. Yashika got married 8 years ago. Today her age is $1\frac{2}{3}$ times her age at the time of her marriage. At present her daughters age is one-sixth of her age. What was her daughter's age 3 years ago ?
- (a) 2 years (b) 3 years
 (c) 4 years (d) 5 years
 (e) None of these

DIRECTIONS (Qs. 21-25) : In each of the following questions a number series is given. A number in the series is expressed by letter 'N'. You have to find out the number in the place of 'N' and use the number to find out the value in the place of the question mark in the equation following the series.

21. 68 68.5 69.5 71 N 75.5 78.5
 $N \times 121 + ? = 10000$
- (a) 1160 (b) 1200
 (c) 1150 (d) 1180
 (e) None of these
22. 19 20 24 33 49 74 N 159
 $N^2 \div 10000 = ?$
- (a) 121.0 (b) 12.1
 (c) 1.21 (d) 0.121
 (e) None of these
23. 51 43 N 30 25 21 18
 $N^2 - 2N = ?$
- (a) 1155 (b) 1224
 (c) 1295 (d) 1368
 (e) None of these
24. 2 5 14 41 122 365 N
 $N - 16\frac{2}{3}\% \text{ of } 5670 - (?)^2 = 10^2$
- (a) 7 (b) $\sqrt{149}$
 (c) 49 (d) $\sqrt{7}$
 (e) None of these
25. 510 254 N 62 30 14 6
 $40\%N + ? = 9^2$
- (a) 31.4 (b) 29.8
 (c) 50.4 (d) 30.6
 (e) None of these

DIRECTIONS (Qs. 26-30): Find out the *approximate* value which should replace the question mark (?) in the following questions. (You are not expected to find out the exact value).

26. $196.1 \times 196.1 \times 196.1 \times 4.01 \times 4.01 \times 4.001 \times 4.999 \times 4.999$
 $= 196.1^3 \times 4 \times ?$

- (a) 100 (b) 16
 (c) 10 (d) 64
 (e) 32

27. $\frac{2}{7} \times \frac{1}{8} + \frac{3}{7} \div \frac{6}{14} = ?$

- (a) $\frac{2}{56}$ (b) $\frac{3}{56}$
 (c) 1 (d) 2.5
 (e) $\frac{50}{60}$

28. $10.1^{2.01} + 2.9^{3.001} = ?$

- (a) 130 (b) 160
 (c) 115 (d) 147
 (e) None of these

29. $\sqrt{1999.9997} = 4.76 \times ?$

- (a) 11 (b) 45
 (c) 49 (d) 6
 (e) 9

30. $23\% \text{ of } 4011 + \frac{1}{7} \text{ of } 5555 = ?$

- (a) 7000 (b) 1900
 (c) 9022 (d) 1700
 (e) 1450

31. Average age of 36 children of the class is 15 years. 12 more children joined whose average age is 16 years. What is the average age of all the 48 children together ?

- (a) 15.25 years (b) 15.5 years
 (c) 15.3 years (d) 15.4 years
 (e) None of these

32. Profit earned by selling an article of ₹1,450 is same as the loss incurred by selling the article for ₹1,280. What is the cost price of the article?

- (a) ₹1,385 (b) ₹1,405
 (c) ₹1,355 (d) ₹1,365
 (e) None of these

33. Two-fifth of two-third of a number is 48. What is 30% of the number?

- (a) 60 (b) 56
 (c) 180 (d) 210
 (e) None of these

34. In a hall 192 children are made to sit in rows and columns and no. of rows is more than the no. of columns by 4. What is the no. of children in each column ?

- (a) 16 (b) 12
 (c) 14 (d) 18
 (e) None of these

35. The total cost of 12 apples and 8 guavas is ₹ 76 and the total cost of 8 apples and 12 guavas is ₹64. What is the total cost of one apple and one guava?

- (a) ₹ 5 (b) ₹ 7
 (c) ₹ 8 (d) ₹ 10
 (e) None of these

REASONING ABILITY

36. If the following series is written in the reverse order, which number will be fourth to the right of the seventh number from the left ?

7, 3, 9, 7, 0, 3, 8, 4, 6, 2, 1, 0, 5, 11, 13

- (a) 0 (b) 5
 (c) 9 (d) 11
 (e) None of these

37. In a certain code language 'ne ri so' means 'good rainy day', 'si ne po' means 'day is wonderful' and 'ri jo' means 'good boy'. Which of the following means 'rainy' in the code?

- (a) ne
 (b) si
 (c) ri
 (d) so
 (e) None of these

38. If SMOOTH is coded as 135579, ROUGH as 97531 and HARD as 9498, then SOFT will be coded as

- (a) 1527 (b) 1347
 (c) 4998 (d) 8949
 (e) 8994

39. Saroj is mother-in-law of Vani who is sister-in-law of Deepak. Rajesh is father of Ramesh, the only brother of Deepak. How is Saroj related to Deepak?

- (a) Mother-in-law (b) Wife
 (c) Aunt (d) Mother
 (e) None of these

40. A directional post is erected on a crossing. In an accident, it was turned in such a way that the arrow which was first showing east is now showing south. A passerby went in a wrong direction thinking it is west. In which direction is he actually travelling now ?

- (a) North
 (b) South
 (c) East
 (d) West
 (e) None of these

DIRECTIONS (Qs. 41 - 45): In each question below, there are three statements followed by two conclusions numbered I and II. You have to take the three given statements to be true even if they seem to be at variance from commonly known facts and then decide which of the given conclusions logically follows from the three statements disregarding commonly known facts.

Give answer (a) if only conclusion I follows.

Give answer (b) if only conclusion II follows.

Give answer (c) if either I or II follows.

Give answer (d) if neither I nor II follows.

Give answer (e) if both I and II follow.

41. **Statements:** All shoes are pens.
Some pens are razors.
Some razors are desks.

Conclusions :

- I. Some desks are shoes.
II. Some razors are shoes.

42. **Statements:**
Some benches are windows.
Some windows are walls.
Some walls are trains.

Conclusions:

- I. "Some trains are benches."
II. No train is bench.

43. **Statements :**
All brushes are chocolates.
All chocolates are mirrors.
All mirrors are tables.

Conclusions:

- I. Some tables are brushes
II. Some mirrors are chocolates.

44. **Statements :**
Some pencils are knives.
All knives are papers.
Some papers are books.

Conclusions:

- I. Some books are pencils.
II. Some papers are pencils.

45. **Statements:**
Some roofs are figures.
All figures are lions.
All lions are goats.

Conclusions:

- I. Some goats are roofs.
II. All goats are figures

DIRECTIONS (Qs. 46-50) : Study the following information carefully to answer the questions that follow.

There are six persons A, B, C, D, E and F. C is the sister of F. B is the brother of E's husband. D is the father of A and grandfather of F. There are two fathers, three brothers and a mother in the group.

46. Who is the mother ?
(a) A (b) B
(c) D (d) E
(e) None of these
47. Who is E's husband ?
(a) B (b) C
(c) A (d) F
(e) None of these
48. How many male members are there in the group?
(a) One (b) Two
(c) Three (d) Four
(e) None of these
49. How is F related to E ?
(a) Uncle (b) Husband
(c) Son (d) Daughter
(e) None of these

50. Which of the following is a group of brothers ?
(a) ABF (b) ABD
(c) BFC (d) BDF
(e) None of these

DIRECTIONS (Qs. 51-55) : Study the following paragraph and then answer the questions that follow.

Five golfers C, D, E, F and G play a series of matches in which the following are always true of the results. Either C is the last and G is the 1st or C is the 1st and G is the last. D finishes ahead of E. Every golfer plays in and finishes every match. There are no ties in any match, i.e. no two players ever finish in the same position in a match.

51. Which of the following cannot be true ?
(a) E finishes second.
(b) F finishes second.
(c) E finishes ahead of F.
(d) F finishes ahead of D.
(e) None of these
52. If D finishes third, then which of the following must be true?
(a) G finishes first.
(b) E finishes ahead of F.
(c) F finishes ahead of E.
(d) F finishes behind D.
(e) None of these
53. If C finishes first, then in how many different orders is it possible for the other golfers to finish?
(a) 1
(b) 2
(c) 3
(d) 4
(e) None of these
54. Which of the following additional conditions make it certain that F finishes second ?
(a) C finishes ahead of D.
(b) D finishes ahead of F.
(c) F finishes ahead of D.
(d) D finishes behind G.
(e) None of these
55. If exactly one golfer finishes between C and D, then which of the following must be true?
(a) C finishes first.
(b) G finishes first.
(c) F finishes third.
(d) E finished fourth.
(e) None of these

DIRECTIONS (Qs. 56-60): In the following questions the symbols

$@$, \oplus , $=$, \odot and \ominus are used with the following meaning:

$P \odot Q$ means P is less than Q .

$P @ Q$ means P is greater than Q .

$P \oplus Q$ means P is greater than or equal to Q .

$P = Q$ means P is equal to Q .

$P \ominus Q$ means P is either smaller than or equal to Q .

Now in each of the following questions, assuming the given statements to be true, find which of the two conclusions I and II given below them is/are definitely true? Give answer.

- (a) if only conclusion I is true.
 (b) if only conclusion II is true.
 (c) if either I or II is true.
 (d) if neither I nor II is true, and
 (e) if both I and II are true.
56. **Statements:** $B @ V, K @ C, C @ B$
Conclusions : I $V @ C$
 II $B @ K$
57. **Statements :** $K @ T, S = K, T @ R$
Conclusions : I $S @ R$
 II $T = R$
58. **Statements :** $U = M, P @ U, M @ B$
Conclusions : I $P = B$
 II $P @ B$
59. **Statements:** $L @ N, J @ P, P @ L$
Conclusions : I $J = L$
 II $P = N$
60. **Statements:** $H @ G, D @ E, H = E$
Conclusions : I $D @ H$
 II $G @ D$

DIRECTIONS (Qs. 61-65): Study the following sequence carefully and answer the questions given below:

ME5PB2A7KN9TRU46IJDF1Q3W8VISZ

61. How many such numbers are there in the above sequence, each of which is both immediately preceded by and immediately followed by a consonant ?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
62. If the order of the first twenty letters/numbrs in the above sequence is reversed and the remaining letters/numbers are kept unchanged, which of the following will be the fourteenth letter number from the right end after the rearrangement?
 (a) B (b) 6
 (c) 2 (d) 1
 (e) None of these
63. Which of the following letter/number is the eighth to the left of the nineteenth letter/number from the left end?
 (a) N (b) T
 (c) 1 (d) D
 (e) None of these
64. Four of the following five are alike in a certain way with regard to their position in the above sequence and so form a group. Which is the one that **does not** belong to that group?
 (a) WIQ (b) PAE
 (c) NR7 (d) 4JR
 (e) D16

65. How many such vowels are there in the above sequence, each of which is immediately preceded by a consonant and immediately followed by a vowel?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three

DIRECTIONS (Qs. 66 - 70) : Study the wing information carefully and answer the questions given below:

A shopkeeper placed eight varieties of cloth pieces of different colours viz. brown, pink, green, white, blue, violet, black and yellow, in a row such that blue cloth is placed fifth from the left end. Green is placed to the extreme right. White cloth is to the second to the left of blue. Violet cloth is exactly in between blue and white. Black is sixth to the left of green and fourth to the left of brown. Pink is not the third to the right of violet.

66. Which colour cloth is placed fifth to the left of yellow?
 (a) Violet (b) Brown
 (c) Green (d) White
 (e) None of these
67. Which of the following is definitely true?
 (a) Green cloth is second to the right of yellow.
 (b) White cloth is placed fifth to the left of brown.
 (c) White cloth is placed exactly in between violet and black.
 (d) Pink cloth occupies second position from the left end.
 (e) All are true
68. Which colour cloth is third to the left of Brown ?
 (a) Yellow (b) Blue
 (c) Green (d) White
 (e) Pink
69. Which of the following is the correct position' of Yellow with respect to Pink?
 (a) Sixth to the right (b) Sixth to the left
 (c) Fifth to the right (d) Fourth to the left
 (e) Fifth to the left
70. Which colour cloth is to the immediate right of Pink?
 (a) White (b) Blue
 (c) Black (d) Brown
 (e) Green

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-85) : Read the following passage carefully and answer the questions given below it. Certain words/phrases have been printed in bold to help you locate them while answering some of the questions.

There was a country long time ago where the people would change a king every year. The person who would become the king had to agree to a **contract** that he would be sent to an island after one year of his being a king.

One king had finished his term and it was time for him to go to the island and live there. The people dressed him up in expensive clothes and put him on an elephant and took him around the cities to say goodbye to all the people. This was a moment of sadness for all kings who ruled for one year. After **bidding** farewell, the people took the king to a remote island in a boat and left him there. On their way back, they discovered a ship that had sunk just recently. They saw a young man who had **survived** by holding on to a floating piece of wood. As they needed a new king, they

picked up the young man and took him to their country. They requested him to be king for a year. First he refused but later he agreed to be the king. People told him about all the rules and regulations and that how he would be sent to an island after one year.

After three days of being a king, he asked the ministers if they could show him the island where all the other kings were sent. They agreed and took him to the island. The island was covered with a thick Jungle and sounds of **vicious** animals were heard coming out of it. The king went a little bit further to check. Soon he discovered dead bodies of all the past kings. He understood that as soon as they were left on the island, the wild animals had come and killed them.

The king went back to the country and collected 100 strong workers. He took them to the island and instructed them to clean the jungle, remove all the deadly animals and cut down all excess trees. He would visit the island every month to see how the work was progressing. In the first month, all the animals were removed and many trees were cut down. In the second month, the whole island was cleaned out. The king then told the workers to plant gardens in various parts of the island. He also took with himself useful animals like chickens, ducks, birds, goats, cows etc. In the third month, he ordered the workers to build big houses and docking stations for ships. Over the months, the island turned into a beautiful place. The young king would wear simple clothes and spend very little from his earnings as a king. He sent all the earnings to the island for storage. When nine months passed like this, the king called the ministers and told them: "I know that I have to go the island after one year, but I would like to go there right now." But the ministers didn't agree to this and said that he had to wait for another three months to complete the year.

Three months passed and now it was a full year. The people dressed up the young king and put him on an elephant to take him around the country to say goodbye to others. However, this king was unusually happy to leave the kingdom. People asked him, "All the other kings would cry at this moment. Why is it that you are laughing?" He replied, "Don't you know what the wise people say? They say that when you come to this world as a baby, you are crying and everyone else is smiling. Live such a life that when you die, you will be smiling and everyone around you will be crying. I have lived that life. While all the other kings were lost into the luxuries of the kingdom, I always thought about the future and planned for it. I turned the deadly island into a beautiful **abode** for me where I can stay peacefully."

71. Why did the people of the kingdom change the king every year?
- As their first king had invented this system and had recorded it in the form of a contract
 - As they believed that the new king would bring better ideas to the kingdom.
 - As they wanted their king to relax on an island after one year of hard work
 - Not mentioned in the passage
 - None of the above
72. What would happen to the king once his term of one year was over ?
- He would be paraded in the cities as a farewell and then be taken to a remote island
 - He would be gifted with expensive clothes and jewellery
 - He would be sent on an island which required a lot of work to be done
 - He would be asked to buy an elephant and go to the remote island himself
 - None of the above
73. What did the young man notice on his visit to the remote island after three days of being king?
- That the animals on the island were too many to be killed
 - That the island was very big
 - That the jungle on the island was full of animals that had killed all the previous kings placed on the island
 - That the island was very beautiful and clean
 - Not mentioned in the passage
74. What happened to the island in the first month of the young king's tenure?
- The wild animals were removed from the island.
 - The whole island was cleaned.
 - Many unnecessary trees were cut down.
- Only A
 - Only B
 - Only C
 - B and C
 - A and C
75. What could be said about the island after the young king had made his servants work on it ?
- The dangerous island had been turned to a beautiful place
 - The island still remained the same despite all the young king's efforts
 - The island was barely tolerable now
 - The island was safe from all types of attacks
 - None of the above
76. Which of the following describes the young king correctly?
- He was intelligent
 - He had foresight
 - He was cunning
- Only A
 - Only C
 - All A, B and C
- A and B
 - B and C
77. What was the king's request to the ministers after the completion of nine months?
- That he should not be sent to the island after completion of one year
 - That he would like to go to the island immediately
 - That he should be paid more in order to improve work on the island
 - That he should be sent to the island after a year
 - None of the above
78. How did the young king arrange for money on the island?
- By selling a large amount of his property
 - By spending all the money derived from his income as a king
 - By borrowing money from the ministers and sending it to the island
 - By spending very less of his income as a king and sending it to the island for storage
 - None of the above

79. Why were the people of the kingdom puzzled when the young king was taken around the country to say goodbye to everyone?
- (a) As they could not believe that one year had elapsed so soon
 (b) As they were not aware that the young king was actually a wise sage
 (c) As the young king was happy to go to the island unlike the previous kings
 (d) Not mentioned in the passage
 (e) None of the above
80. What can possibly be the moral of the story?
- (a) Always put others before yourself
 (b) Give respect to others
 (c) Live in the present and forget about the future
 (d) Do not put things off until tomorrow
 (e) Always think and plan ahead

DIRECTIONS (Qs. 81-83): Choose the word/group of words which is most similar in meaning to the word/group of words printed in bold as used in the passage.

81. **CONTRACT**
- (a) work (b) signature
 (c) deal (d) temporary
 (e) get
82. **BIDDING**
- (a) wishing (b) auctioning
 (c) wasting (d) playing
 (e) talking
83. **ABODE**
- (a) stop (b) mountain
 (c) plenty (d) house
 (e) dwelling

DIRECTIONS (Qs. 84 & 85) : Choose the word / group of words which is most opposite in meaning to the word / group of words printed in bold as used in the passage.

84. **SURVIVED**
- (a) scratched (b) died
 (c) lived (d) fell
 (e) suffered
85. **VICIOUS**
- (a) simple (b) small
 (c) tough (d) harmless
 (e) ferocious

DIRECTIONS (Qs. 86-90) : Rearrange the following six sentences (A), (B), (C), (D), (E) and (F) in the proper sequence to form a meaningful paragraph; then answer the questions given below them.

- (A) All of a sudden the mother duck saw a fox in the distance, was frightened and shouted, "Children, hurry to the lake, there's a fox!"
- (B) The mother duck ran, leading the fox away from the lake and as soon as the fox came very close, the mother duck quickly spread her wings and rose up in the air.

- (C) The ducklings hurried towards the lake and the mother duck began to walk back and forth dragging one wing on the ground.
- (D) A mother duck and her little ducklings were on their way to the lake one day.
- (E) The fox stared in disbelief at the mother duck and her ducklings as he could not reach the ducklings because they were in the middle of the lake by now.
- (F) When the fox saw her he became happy as he thought that the mother duck was hurt and couldn't fly and that he could easily catch and eat her!
86. Which of the following should be the **FIRST** sentence after rearrangement?
- (a) A (b) B
 (c) C (d) D
 (e) E
87. Which of the following should be the **SECOND** sentence after rearrangement?
- (a) A (b) B
 (c) C (d) D
 (e) F
88. Which of the following should be the **THIRD** sentence after rearrangement?
- (a) A (b) B
 (c) C (d) D
 (e) E
89. Which of the following should be the **FOURTH** sentence after rearrangement?
- (a) B (b) C
 (c) D (d) E
 (e) F
90. Which of the following should be the **LAST (SIXTH)** sentence after rearrangement?
- (a) A (b) B
 (c) D (d) E
 (e) F

DIRECTIONS (Qs. 91-95) : Which of the phrases (a), (b), (c) and (d) given below each sentence should replace the phrase printed in bold in the sentence to make it grammatically correct? If the sentence is correct as it is given and 'No correction is required', mark (e) as the answer.

91. As it was a dark and stormy night, Lata was **too scared to** go home alone.
- (a) very scary to (b) much scared to
 (c) as scared to (d) to scared too
 (e) No correction required
92. Since it was her engagement party, Riya was **dress to kill**.
- (a) dresses to kill (b) dressed to kill
 (c) dressed to killings (d) dressing to killed
 (e) No correction required
93. Ramesh **worries endlessly** about his son's future as he was so poor in studies.
- (a) worry endless (b) worried endless
 (c) worried endlessly (d) worries endless
 (e) No correction required

94. Now that the actual criminal had been caught, Kunal was happy that he was finally let **of the hook**.
 (a) off the hook (b) of the hookings
 (c) off the hooks (d) of the hooks
 (e) No correction required
95. The little boy appeared all of a sudden out of nowhere and **take everyone by surprise**.
 (a) took everyone as surprised
 (b) take everyone with surprised
 (c) took everyone by surprises
 (d) took everyone by surprise
 (e) No correction required
- DIRECTION (Qs. 96-100): In each of the following sentences, an idiomatic expression or a proverb is highlighted. Select the alternative which best describes its use in the sentence.**
96. He went to his friend's house in the evening **as was his wont**.
 (a) as usual (b) as he wanted
 (c) as his want was (d) as he wanted that day
 (e) none of these
97. Why do you wish to **tread on the toes**?
 (a) To give offence to them
 (b) To follow them grudgingly
 (c) To treat them indifferently
 (d) To be kicked by them
 (e) None of these
98. He intends **setting up** as a lawyer in the adjoining district.
 (a) To establish himself (b) To migrate
 (c) To join (d) To settle
 (e) None of these
99. The autographed bat from the famous cricketer Sunil Gavaskar is **worth a jew's eye**.
 (a) Not a worthy possession
 (b) unnecessary
 (c) A costly items
 (d) A possession of high value
 (e) None of these
100. The speaker gave a **bird's eye view** of the political conditions in the country.
 (a) a personal view (b) a general view
 (c) a biased view (d) a detailed presentation
 (e) None of these

RESPONSE SHEET

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| 91. | <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d <input type="radio"/> e | 92. | <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d <input type="radio"/> e | 93. | <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d <input type="radio"/> e | 94. | <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d <input type="radio"/> e | 95. | <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d <input type="radio"/> e |
| 96. | <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d <input type="radio"/> e | 97. | <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d <input type="radio"/> e | 98. | <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d <input type="radio"/> e | 99. | <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d <input type="radio"/> e | 100. | <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d <input type="radio"/> e |

Answer Key

1	(c)	11	(c)	21	(e)	31	(a)	41	(d)	51	(a)	61	(e)	71	(d)	81	(c)	91	(e)
2	(d)	12	(b)	22	(c)	32	(d)	42	(c)	52	(c)	62	(a)	72	(a)	82	(a)	92	(b)
3	(a)	13	(d)	23	(b)	33	(e)	43	(e)	53	(c)	63	(e)	73	(c)	83	(e)	93	(c)
4	(b)	14	(b)	24	(a)	34	(a)	44	(b)	54	(c)	64	(e)	74	(e)	84	(b)	94	(a)
5	(c)	15	(b)	25	(d)	35	(b)	45	(a)	55	(d)	65	(a)	75	(a)	85	(d)	95	(d)
6	(d)	16	(a)	26	(a)	36	(a)	46	(d)	56	(b)	66	(e)	76	(e)	86	(d)	96	(a)
7	(e)	17	(b)	27	(c)	37	(d)	47	(c)	57	(d)	67	(c)	77	(b)	87	(a)	97	(a)
8	(b)	18	(c)	28	(a)	38	(a)	48	(d)	58	(c)	68	(d)	78	(d)	88	(c)	98	(a)
9	(b)	19	(d)	29	(e)	39	(d)	49	(c)	59	(d)	69	(a)	79	(c)	89	(e)	99	(d)
10	(d)	20	(b)	30	(d)	40	(b)	50	(a)	60	(e)	70	(c)	80	(e)	90	(d)	100	(b)

Answers & Explanations

1. (c) Given Expression = $\frac{a^2 + ab + b^2}{a^3 - b^3}$, where $a = 137, b = 133$

$$= \frac{(a^2 + ab + b^2)}{(a-b)(a^2 + ab + b^2)} = \frac{1}{(a-b)} = \frac{1}{137-133} = \frac{1}{4}$$

2. (d) $\sqrt{3^n} = 81 \Rightarrow 3^{n/2} = 3^4 \Rightarrow \frac{n}{2} = 4 \Rightarrow n = 8$

3. (a) $[(5\sqrt{7} + \sqrt{7}) \times (4\sqrt{7} + 8\sqrt{7})] - (19)^2 = ?$

$$\Rightarrow (6\sqrt{7} \times 12\sqrt{7}) - (361) = ?$$

$$\Rightarrow 72 \times \sqrt{7} \times \sqrt{7} - 361 = ?$$

$$\therefore ? = 504 - 361 = 143$$

4. (b) $(4444 \div 40) + (645 \div 25) + (3991 \div 26) = ?$

$$\Rightarrow ? = (111.1) + (25.8) + (153.5) \Rightarrow ? = 290.4$$

5. (c) Given Expression = $\frac{0.207}{\frac{0.0023}{23}} = \frac{0.207}{0.0001} = \frac{0.2070}{0.0001} = 2070$.

6. (d) Given Expression = $\frac{21 \div 7}{5 + 5 + \frac{5}{5}} = \frac{3}{11}$

7. (e) $\sqrt{33124} \times \sqrt{2601} - (83)^2 = (?)^2 (37)^2$

$$\Rightarrow (?)^2 = \sqrt{33124} \times \sqrt{2601} - (83)^2 - (37)^2$$

$$\Rightarrow (?)^2 = 182 \times 51 - 6889 - 1369$$

$$\Rightarrow (?)^2 = 9282 - 6889 - 1369$$

$$\Rightarrow (?)^2 = 1024$$

$$\therefore ? = \sqrt{1024} = 32$$

8. (b) $5\frac{17}{37} \times 4\frac{51}{52} \times 11\frac{1}{7} + 2\frac{3}{4} = ?$

$$\Rightarrow \left(\frac{202}{37} \times \frac{259}{52} \times \frac{78}{7}\right) + \left(\frac{11}{4}\right) = ?$$

$$\Rightarrow 303 + \frac{11}{4} = ?$$

$$\therefore ? = \frac{1223}{4} = 305.75$$

9. (b) $\frac{\sqrt{32} + \sqrt{48}}{\sqrt{8} + \sqrt{12}} = \frac{\sqrt{16 \times 2} + \sqrt{16 \times 3}}{\sqrt{4 \times 2} + \sqrt{4 \times 3}} = \frac{4\sqrt{2} + 4\sqrt{3}}{2\sqrt{2} + 2\sqrt{3}}$

$$= \frac{4(\sqrt{2} + \sqrt{3})}{2(\sqrt{2} + \sqrt{3})} = 2$$

10. (d) $\frac{1}{\sqrt{9} - \sqrt{8}} = \frac{1}{\sqrt{9} - \sqrt{8}} \times \frac{\sqrt{9} + \sqrt{8}}{\sqrt{9} + \sqrt{8}} = \frac{3 + 2\sqrt{2}}{9 - 8} = (3 + 2\sqrt{2})$.

11. (c) Let Principal = ₹ P

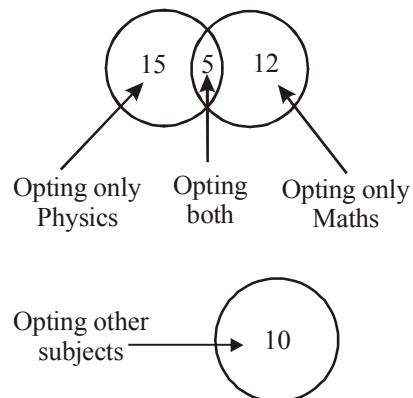
$$P\left(1 + \frac{10}{100}\right)^3 - P = 993 \Rightarrow \left(\frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} - 1\right)P = 993$$

$$\Rightarrow \left(\frac{1331 - 1000}{1000}\right)P = 993 \text{ or,}$$

$$P = \frac{993 \times 1000}{331} = 3000$$

$$\therefore \text{Simple interest} = ₹ \left(\frac{3000 \times 3 \times 10}{100}\right) = ₹ 900$$

12. (b)

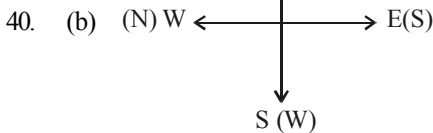
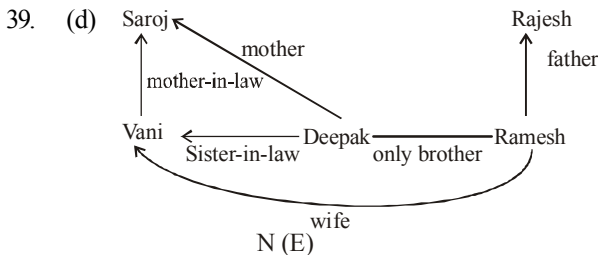


$$\text{Total no. of students} = 15 + 5 + 12 + 10 = 42$$

13. (d) Concentration of boric acid = 80% = 80 cc
Quantity of water = 20 cc
Let x cc of water be added to get the concentration of 50%.
 $\Rightarrow \frac{80}{100+x} = \frac{50}{100}$ or $\frac{80}{100+x} = \frac{1}{2}$ or $x = 60$ cc
14. (b) Successive discounts of 20% and 15% on ₹ 100 yields to
 $100 \times 0.8 \times 0.85 = ₹ 68$
 \therefore Single discount = $(100 - 68) = 32\%$
15. (b) Let the length and breadth of the rectangular room be ℓ and b .
We have, $\frac{\ell+4}{b+4} = \frac{4}{3} \Rightarrow 3\ell + 12 = 4b + 16$
 $\Rightarrow 3\ell - 4b = 4$ (i)
Again, we have $\frac{\ell-4}{b-4} = \frac{2}{1} \Rightarrow \ell - 4 = 2b - 8$
 $\Rightarrow \ell - 2b = -4$ (ii)
Solving (i) and (ii), we get $\ell = 12$ and $b = 8$.
16. (a) Let the second car overtakes the first car after t hours.
Distance covered by the first car = Distance covered by the second car.
 $\Rightarrow 10t = 8 + \left(8 + \frac{1}{2}\right) + \left(8 + \frac{2}{2}\right) + \dots + \left(8 + \frac{t-1}{2}\right)$
or $10t = 8t + \frac{1}{2}[1+2+\dots+(t-1)]$
or $10t = 8t + \frac{1}{2} \frac{t(t-1)}{2}$ or $2t = \frac{1}{4}(t^2 - t)$
 $\Rightarrow t = 9$ hrs. [$t \neq 0$]
17. (b) $m_1 \times d_1 \times t_1 \times w_2 = m_2 \times d_2 \times t_2 \times w_1$
 $24 \times 10 \times 8 \times 1 = m_2 \times 6 \times 10 \times 1$
 $\Rightarrow m_2 = \frac{24 \times 10 \times 8}{6 \times 10} = 32$ men
18. (c) Let the two digit number be $10x + y$
We have $x + y = 15$ (i)
and $(10x + y) + 9 = (10y + x)$ or $9x - 9y = -9$
or $x - y = -1$ (ii)
From (i) and (ii) $x = 7$ and $y = 8$
The number is $10 \times 7 + 8 = 78$
19. (d) Let edge of the new cube = x cm.
Volume of the newly formed figure (cube) = sum of volume of smaller cubes.
i.e. $(x)^3 = (3)^3 + (4)^3 + (5)^3 = 27 + 64 + 125 = 216 \Rightarrow x = 6$ cm
20. (b) Let present age of yashika = x years
 \therefore Age of yashika at the time of marriage = $(x - 8)$ years
 $\therefore x = \frac{9}{7}(x - 8)$
 $\Rightarrow 7x = 9x - 72$ $\therefore x = \frac{72}{2} = 36$ years
 \therefore Present age of the daughter = $36 \times \frac{1}{6} = 6$ years
 \therefore Her daughter's age 3 years ago = $(6 - 3) = 3$ years
21. (e) The series is $+0.5, +1, +1.5, +2, \dots$
22. (c) The series is $+1^2, +2^2, +3^2, +4^2, \dots$
23. (b) The series is $-8, -7, -6, -5, \dots$
24. (a) The series is $\times 3 - 1$ in each term.
25. (d) The series is $\div 2 - 1$ in each term.
26. (a) $196.1 \times 196.1 \times 196.1 \times 4.01 \times 4.01 \times 4.001 \times 4.999 \times 4.999$
 $= (196.1)^3 \times 4 \times ?$
or $4 \times ? = 4.01 \times 4.001 \times 4.999 \times 4.999$ or $? = 4 \times 5 \times 5 = 100$
27. (c) $? = \frac{2}{7} \times \frac{1}{8} + \frac{3}{7} \times \frac{14}{6} = \frac{1}{28} + 1 = 1\frac{1}{28} = 1$
28. (a) $? = (10.1)^{2.01} + (2.9)^{3.001} = (10)^2 + (3)^3 = 100 + 27 = 130$
29. (e) $4.76 \times ? = \sqrt{1999.9997}$
 $4.76 \times ? = 44.72$ or $? = 9$
30. (d) $? = 23\%$ of 4011 + $\frac{1}{7}$ of 5555 = $922.53 + 793.57 = 1700$
31. (a) Required average age
 $= \left(\frac{15 \times 36 + 12 \times 16}{36 + 12}\right)$ years = $\left(\frac{540 + 192}{48}\right)$ years
 $= 15.25$ years
32. (d) Let the CP of the article be ₹ x .
According to the question,
 $1450 - x = x - 1280$
 $\Rightarrow 2x = 1450 + 1280 = 2730$
 $\Rightarrow x = \frac{2730}{2} = ₹ 1365$
33. (e) Let the number be x .
According to the question,
 $= x \times \frac{2}{3} \times \frac{2}{5} = 48$
 $\Rightarrow x = \frac{48 \times 15}{4} = 180$
 $\therefore 30\%$ of 180 = $\frac{180 \times 30}{100} = 54$
34. (a) $12 \times 16 = 192$
In other words, number of rows = 16
and number of children in each row = 12 and number of children in each column = 16
35. (b) Let the CP of an apple be ₹ x and that of a guava = ₹ y .
 $\therefore 12x + 8y = 76$ and
 $8x + 12y = 64$
On adding,
 $20x + 20y = 140$
 $\Rightarrow 20(x + y) = 140$
 $\Rightarrow x + y = \frac{140}{20} = 7 = ₹ 7$
36. (a) The given series when written in the reverse order becomes.
13, 11, 5, 0, 1, 2, 6, 4, 8, 3, 0, 7, 9, 3, 7
The 7th number from the left is 6. The 4th number to the right of 6 is 0.

37. (d)
- ne ri so → good rainy day
- si ne po → day is wonderful
- ri jo → good boy

38. (a) SMOOTH ≡ 135579
 ROUGH ≡ 97531
 HARD ≡ 9498 ⇒ O = 5
 Clearly, only the first option i.e. 1527 contains 5. Hence, the correct code for SOFT in the code would be 1527.



When the arrow turns, East becomes South, North becomes East, West becomes North and South becomes West.

So the traveller must be actually travelling in the South thinking it is West.

41. (d) All shoes are pens. (A-type)

Some pens are razors. (I-type)
 A + I ⇒ No Conclusion

42. (c) All the three Premises are Particular Affirmative (I-type).
 No Conclusion follows from Particular Premises.
 Conclusion I and II from Complementary Pair.
 Therefore, either I or II follows

43. (e) All brushes are chocolates. (A-type)

All chocolates are mirrors. (A-type)
 A + A ⇒ A-type Conclusion
 "All brushes are mirrors"
 All brushes are mirrors. (A-type)

All mirrors are tables. (A-type)
 "All brushes are tables"
 Conclusion I is converse of this Conclusion.
 Conclusion II is converse of the second Premise.

44. (b) Some pencils are knives. (I-type)

All knives are papers. (A-type)
 I + A ⇒ I-type Conclusion

- "Some pencils are papers"
 Conclusion II is converse of this Conclusion.
45. (a) Some roofs are figure. (I-type)

All figures are lions. (A-type)
 I + A ⇒ I-type Conclusion
 "Some roofs are lions."
 Some roofs are lion. (I-type)

All lions are goats. (A-type)
 I + A ⇒ I-(A-type) Conclusion
 "Some roofs are goats"
 Conclusion I is converse of this Conclusion.

46. (d) A's wife E is the mother.
 47. (c) A is the husband of E.
 48. (d) Clearly there are four male members A, B, D and F.
 49. (c) Clearly, F is the son of E
 50. (a) A, B are brothers of each other while F is the brother of C.
 51. (a) Either C or G has to be first and D has to come before E. Hence, E cannot, finish second.
 52. (c) F finishes second when D finishes third. Thus F finishes ahead of E.
 53. (c) In the event of C finishing first, G finishes last and we will have the following three possible ordering of finishes.
 CFDEG, CDEFG and CDFEG.
 54. (c) When F finishes ahead of D, then F will definitely finish at the second place.
 55. (d) When there is exactly one golfer between C and D, then E finishes at the fourth place.
 56. (b) $B > V \dots(i)$ $K < C \dots(ii)$; $C \leq B \dots(iii)$
 No relationship can be find out between V and C.
 Hence I does not follow.
 From (ii) and (iii), $B > K$. Hence II follows.
 57. (d) $K > T \dots(i)$; $S = K \dots(ii)$; $T \leq R \dots(iii)$
 Neither relationship can be established .
 58. (c) $U = M \dots(i)$ $P \geq U \dots(ii)$; $M \geq B \dots(iii)$
 Combining, we get $P \geq U = M \geq B \Rightarrow P \geq B$
 $\Rightarrow P = B$ or $P > B$
 59. (d) $L \geq N \dots(i)$; $J \leq P \dots(ii)$; $P \geq L \dots(iii)$
 Neither relationship can be established.
 60. (e) $H \geq G \dots(i)$; $D > E \dots(ii)$; $H = E \dots(iii)$
 Combining, we get $D > E = H \geq G$
 $\Rightarrow D > H$ and $G < D$
 61. (e) Four
 ME5PB2A7KN9TRU46IJDF1Q3W8VIS
 Z

62. (a) F D J I 6 4 U R T 9 N K 7 A 2 B P 5 E M 1 Q 3 W 8 V I S Z
63. (e) Eighth to the left of the nineteenth letter/number from the left $\Rightarrow (19 - 8) = 11$ th letter/number from left. Hence, required element is 9.
64. (e) Except its second element in each group is third to the right of first element while third element of each group is second to the left of first element of the respective group.
65. (a) There are no such vowels.

(For Answers 66-70)

L	Pink	Black	White	Violet	Blue	Brown	Yellow	Green	R
E									I
F									G
T									H

66. (e) Black colour cloth is placed fifth to the left of Yellow colour cloth.
67. (c) White cloth is placed exactly in between Violet and Black.
68. (d) White cloth is third to the left of Brown.
69. (a) yellow is sixth to the right of Pink.
70. (c) Black is to the immediate right of Pink.
71. (d) The reason behind the question is not mentioned in the passage.
72. (a) Refer to the second sentence of the first para of the passage that the king had to agree to a contract..... being a king.
73. (c) Refer to the sentence that the island was covered..... discovered dead bodies..... past kings of the second last sentence of the third para of the passage.
74. (e) Refer to the fourth sentence that in the first month..... trees were cut down..... of the fourth para of the passage.
75. (a) Refer to the last sentence "I turned the deadly island..... a beautiful abode..... peacefully" of the sixth para of the passage.
76. (e) From reading the passage thoroughly we come to the conclusion that the king was intelligent, foresight and cunning as he made deadly island a beautiful place to live in with all luxuries of the kingdom.
77. (b) Refer to the sentence that 'I know..... complete the year' of the statement made by king in the fourth para of the passage.
78. (d) Refer to the second last sentence of the fourth para that he sent all the..... for storage..... of the passage.
79. (c) Refer to the third sentence that however, the king..... leave the kingdom..... of the last para of the passage.
80. (e) The moral of the story is 'Always think and plan ahead'.
81. (c) The word contract means agreement. Compact, bond, deal, bargain etc. are the most similar word in meaning.
82. (a) The word bidding means order, command, wish, desire, request, direction etc. Hence wishing is most similar in meaning of the given word.
83. (e) The word abode means house, dwelling, residence and habitation etc.
84. (b) The word survived means remained alive, lived, endured etc. Hence died is the most opposite word in meaning.
85. (d) The word vicious means brutal, savage, dangerous, cruel etc. Its opposite word will be gentle, kindly, harmless etc.

(For Answers 86-90)

Sentences are re-arranged in order as **DACFBE**. A mother duck is the clue and qualifier of a sentence which is followed by A, C, F and finally B and E.

91. (e) Here, too is used as emphatic word. Lata was so scared that she could not go home alone. Hence, no correction is required.
92. (b) The structure of sentence is subject + was/were + third form of verb + object. Thus, Riya was dressed to kill.
93. (c) The given sentence is the statement of simple past tense. Hence it should be 'worried' instead of worries.
94. (a) The phrase 'let off' means to give them only a light punishment.
95. (d) It should be 'took' instead of 'take'.

3

PRACTICE SET

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $1/4^{\text{th}}$ of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-10) : What should come in place of the question mark (?) in the following questions ?

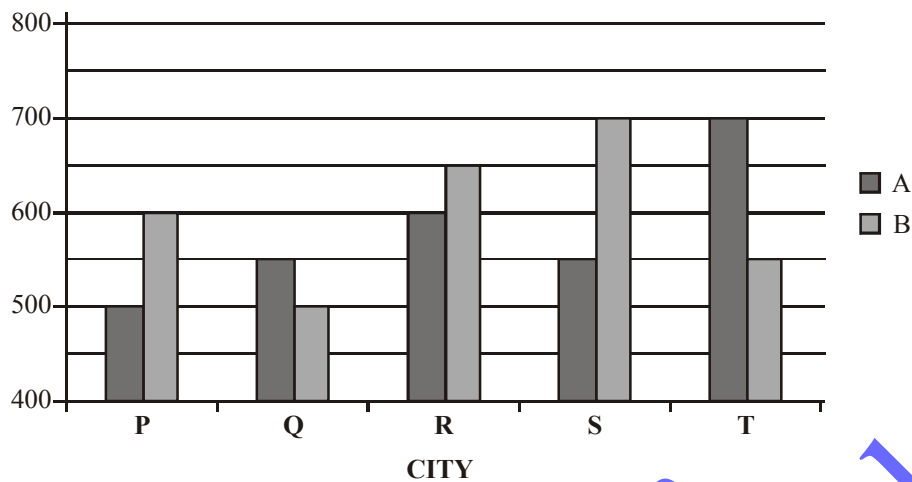
- $(786 \times 64) \div 48 = ?$
(a) 1050 (b) 1024
(c) 1048 (d) 1036
(e) None of these
- $\sqrt[3]{13824} \times \sqrt{?} = 864$
(a) 1296 (b) 1156
(c) 1600 (d) 1024
(e) None of these
- 60% of 20% of $\frac{3}{5}$ th of ? = 450
(a) 6200 (b) 6,240
(c) 6150 (d) 6275
(e) None of these
- $196 \times 948 \div 158 = ?$
(a) 1156 (b) 1200
(c) 1188 (d) 1176
(e) None of these
- $3.5 + 11.25 \times 4.5 - 32.5 = ?$
(a) 18.275 (b) 21.625
(c) 32.375 (d) 25.45
(e) None of these
- $\frac{\sqrt{4096} \times 56}{764 - 652} = ?$
(a) 36 (b) 48
(c) 32 (d) 44
(e) None of these
- $(98360 + 25845 - 36540) \div 2500 = ?$
(a) 36.585 (b) 30.082
(c) 32.085 (d) 35.066
(e) None of these
- $7414 + 3698 + 1257 + 1869 = ?$
(a) 14328 (b) 14438
(c) 13428 (d) 13248
(e) None of these
- $(91)^2 + (41)^2 - \sqrt{?} = 9858$
(a) 11236 (b) 10816
(c) 10404 (d) 9604
(e) None of these
- $(2640 \div 48) \times (2240 \div 35) = ?$
(a) 3520
(b) 3515
(c) 3495
(d) 3490
(e) None of these

DIRECTIONS (Qs. 11-15): What should come in place of question mark (?) in the following number series ?

11. 121 117 108 92 67 ?
 (a) 31 (b) 29
 (c) 41 (d) 37
 (e) None of these
12. 50 26 14 ? 5 3.5
 (a) 6 (b) 8
 (c) 10 (d) 12
 (e) None of these
13. 3 23 43 ? 83 103
 (a) 33 (b) 53
 (c) 63 (d) 73
 (e) None of these
14. 748 737 715 682 638 ?
 (a) 594 (b) 572
 (c) 581 (d) 563
 (e) None of these
15. 1 9 25 49 81 ? 169
 (a) 100 (b) 64
 (c) 81 (d) 121
 (e) None of these
16. The ratio of ducks and frogs in a pond is 37 : 39 respectively. The average number of ducks and frogs in the pond is 152. What is the number of frogs in the pond ?
 (a) 148 (b) 152
 (c) 156 (d) 144
 (e) None of these
17. The number of employees in Companies A, B and C are in a ratio of 4 : 5 : 6 respectively. If the number of employees in the Companies is increased by 25%, 30% and 50% respectively, what will be the new ratio of employees working in Companies A, B and C respectively?
 (a) 13 : 10 : 18 (b) 10 : 13 : 17
 (c) 13 : 15 : 18 (d) Cannot be determined
 (e) None of these
18. The average of five positive numbers is 213. The average of the first two numbers is 233.5 and the average of last two numbers is 271. What is the third number ?
 (a) 64 (b) 56
 (c) 106 (d) Cannot be determined
 (e) None of these
19. Sonali invests 15% of her monthly salary in insurance policies. She spends 55% of her monthly salary in shopping and on household expenses. She saves the remaining amount of Rs. 12,750. What is Sonali's monthly income ?
 (a) ₹. 42,500 (b) ₹ 38,800
 (c) ₹ 40,000 (d) ₹ 35,500
 (e) None of these
20. What **approximate** amount of compound interest can be obtained on an amount of ₹ 9,650 at the rate of 6% p.a. at the end of 3 years ?
 (a) ₹ 1,737 (b) ₹ 1,920
 (c) ₹ 1,720 (d) ₹ 1,860
 (e) ₹ 1,843
21. A milkman sells 120 litres of milk for ₹ 3,360 and he sells 240 litres of milk for Rs. 6,120. How much concession does the trader give per litre of milk, when he sells 240 litres of milk ?
 (a) ₹ 2 (b) ₹ 3.5
 (c) ₹ 2.5 (d) ₹ 1.5
 (e) None of these
22. When 3,626 is divided by the square of a number and the answer so obtained is multiplied by 32, the final answer obtained is 2,368. What is the number ?
 (a) 7 (b) 36
 (c) 49 (d) 6
 (e) None of these
23. The sum of the digits of a two digit number is 14. The difference between the first digit and the second digit of the two digit number is 2. What is the product of the two digits of the two digit number ?
 (a) 56 (b) 48
 (c) 45 (d) Cannot be determined
 (e) None of these
24. A car runs at the speed of 50 kmph when not serviced and runs at 60 kmph, when serviced. After servicing the car covers a certain distance in 6 hours. How much time will the car take to cover the same distance when not serviced ?
 (a) 8.2 hours (b) 6.5 hours
 (c) 8 hours (d) 7.2 hours
 (e) None of these
25. Venkat has some ducks and some sheep. If the total number of animal heads is 81 and the total number of animal feet are 268, how many sheep does Venkat have?
 (a) 28 (b) 53
 (c) 44 (d) Cannot be determined
 (e) None of these
26. The sum of the two digits of a two digit number is 13. The difference between the two digits of the number is 3. What is the two digit number?
 (a) 85 (b) 49
 (c) 57 (d) Cannot be determined
 (e) None of these
27. 25 shirt pieces of 125 cms. each can be cut from a reel of cloth. After cutting these pieces 90 cms. of cloth remains. What is the length of the reel of cloth in metres?
 (a) 3215 metres (b) 35.15 metres
 (c) 32.15 metres (d) 3515 metres
 (e) None of these
28. The sum of the squares of two consecutive positive odd numbers is 650. Which is the larger number?
 (a) 17 (b) 21
 (c) 23 (d) 15
 (e) None of these
29. The profit earned after selling a pair of shoes for ₹ 2,033 is the same as loss incurred after selling the same pair of shoes for ₹ 1,063. What is the cost of the shoes?
 (a) ₹ 1,650 (b) ₹ 1,548
 (c) ₹ 1,532 (d) Cannot be determined
 (e) None of these
30. When an amount of ₹ 1,58,965 is divided equally amongst 120 people, how much approximate amount would each person get?
 (a) ₹ 1,330 (b) ₹ 1,315
 (c) ₹ 1,335 (d) ₹ 1,320
 (e) ₹ 1,325

DIRECTIONS (Qs. 31-35) : Study the following graph carefully and answer the questions that follow :

The graph given below represents the number of users of two broadband services A and B across 5 cities P, Q, R, S and T.



31. What is the total number of users of brand B across all five cities together ?
 (a) 2700 (b) 3000
 (c) 3100 (d) 2900
 (e) 3200
32. The number of users of brand A in city T is what percent of the number of users of brand B in City Q ?
 (a) 150 (b) 110
 (c) 140 (d) 160
 (e) 120
33. What is the average number of users of brand A across all five cities together ?
 (a) 560 (b) 570
 (c) 580 (d) 590
 (e) 550
34. What is the difference between the total number of users of Brand A and B together in city R and the total number of users of brand A and B together in city P ?
 (a) 170 (b) 140
 (c) 130 (d) 150
 (e) 160
35. What is the respective ratio of the number of users of brand A in city P to the number of users of brand B in city S ?
 (a) 5 : 7 (b) 4 : 7
 (c) 2 : 5 (d) 3 : 4
 (e) 5 : 6
36. **Statements :** All books are notes.
 Some notes are pencils.
 No pencil is paper.
Conclusions : I. Some notes are books.
 II. Some pencils are books.
 III. Some books are papers.
 IV. No book is a paper.
 (a) Only I and either III or IV follow
 (b) Either III or IV follows
 (c) Only I and III follow
 (d) Neither II nor III follows
 (e) None of these
37. **Statements :** Some tables are chairs.
 No cupboard is table.
 Some chairs are cupboards.
Conclusions : I. Some chairs are not tables.
 II. All chairs are either tables or cupboards.
 III. Some chairs are tables.
 IV. All chairs are tables.
 (a) Only I and IV follow
 (b) Only either II or III follows
 (c) Only I and III follows
 (d) Either II or III and I follow
 (e) None of these
38. **Statements :** No table is fruit.
 No fruit is window.
 All windows are chairs.
Conclusions : I. No window is table.
 II. No chair is fruit.
 III. No chair is table.
 IV. All chairs are windows.
 (a) Either I or III follows (b) All follow
 (c) Only I and II follow (d) Only III and IV follow
 (e) None of these

REASONING ABILITY

DIRECTIONS (Qs. 36-40) : In each of the questions below are given three statements followed by four conclusions numbered I, II, III and IV. You have to take the given statements to be true even if they seem to be at variance with commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

- (a) Either I or III follows (b) All follow
 (c) Only I and II follow (d) Only III and IV follow
 (e) None of these

39. **Statements :** No man is sky.
No sky is road.
Some men are roads.
- Conclusions :** I. No road is man.
II. No road is sky.
III. Some skies are men.
IV. All roads are men.
- (a) Either I or IV follows (b) Only I follows
(c) Only I and III follow (d) Only II follows
(e) None of these

40. **Statements :** All papers are books.
All bags are books.
Some purses are bags.
- Conclusions :** I. Some papers are bags.
II. Some books are papers.
III. Some books are purses.
- (a) Only I follows
(b) Only II and III follow
(c) Only I and III follow
(d) Only I and II follow
(e) None of these

DIRECTIONS (Qs. 41-45) : In the following questions, the symbols %, *, @, \$ and # are used with the following meaning as illustrated below :

- 'P @ Q' means 'P is not smaller than Q'.
'P # Q' means 'P is not greater than Q'.
'P % Q' means 'P is neither greater than nor equal to Q'.
'P * Q' means 'P is neither smaller than nor greater than Q'.
'P \$ Q' means 'P is neither smaller than nor equal to Q'.

41. **Statements :** T\$K, K#R, R*M
- Conclusions :** I. M*K
II. M % T
III. M\$K
- (a) All follows
(b) Only either I or III follows
(c) Only either I or II follows
(d) Only either II or III follows
(e) None of these
42. **Statements :** M%R, R#T, T*N
- Conclusions :** I. N*R
II. N\$R
III. N\$M
- (a) All follows
(b) Either I or II follows
(c) Either I or II and III follows
(d) Either I or III and II follows
(e) None of these
43. **Statements :** V@M, A\$M, R#V
- Conclusions :** I. R#A
II. V@A
III. R\$M
- (a) Only I follows (b) Only II follows
(c) Only III follows (d) None follows
(e) All follow

44. **Statements :** B*D, D@H, H%F
- Conclusions :** I. B*F
II. B\$F
III. D\$F
- (a) None follows
(b) Only either I or II follows
(c) Only either I or II and III follows
(d) Only III follows
(e) All follow
45. **Statements :** J#N, K@N, T\$K
- Conclusions :** I. J%T
II. T\$N
III. N@J
- (a) None follows
(b) Only I or II follow
(c) Only I and III follow
(d) Only II and III follow
(e) All follow

DIRECTIONS (Qs. 46-50) : Study the information given below to answer the questions that follow :

- (i) There is a family of 5 persons A, B, C, D and E.
(ii) They are working as a doctor, a teacher, a trader, a lawyer and a farmer.
(iii) B, an unmarried teacher, is the daughter of A.
(iv) E, a lawyer, is the brother of C.
(v) C is the husband of the only married couple in the family.
(vi) Daughter-in-law of A is a doctor.
46. Which of the following is a group of female members in the family?
- (a) A and D (b) D and E
(c) A, C and E (d) B and D
(e) None of these
47. Which of the following is the married couple?
- (a) A and B (b) C and D
(c) A and D (d) B and C
(e) None of these
48. Which of the following is a group of male members in the family?
- (a) A, B and C (b) B and D
(c) C and E (d) A, C and D
(e) None of these
49. Who is the doctor in the family?
- (a) A (b) B
(c) C (d) D
(e) None of these
50. Who is the trader in the family?
- (a) A (b) B
(c) C (d) D
(e) None of these

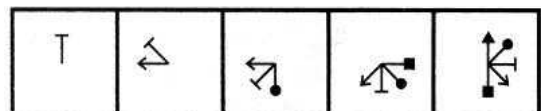
DIRECTIONS (Qs. 51-55): Answer these questions referring to the symbol-letter-number sequence given below:

E G 4 B H 7 5 @ K 8 D N £ Q Z \$ W 3 C 1 9 * 1 B 2 S 6

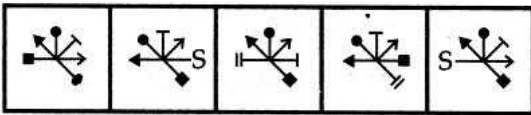
51. How many such consonants are there in the above sequence which are immediately preceded by a symbol and immediately followed by a digit ?
 (a) One (b) Two
 (c) None (d) Three
 (e) More than three
52. What should come in place of the question mark (?) in the following sequence ?
 4H@, KDQ, ?, ILS
 (a) ZW1 (b) NQ\$
 (c) @8N (d) \$W9
 (e) None of these
53. Which of the following is exactly in the midway between the ninth from left end and the seventh from right end ?
 (a) Q (b) Z
 (c) \$ (d) W
 (e) None of these
54. If the first fifteen elements are written in the reverse order then which of the following will be seventh to the left of twelfth element from right end ?
 (a) 7 (b) @
 (c) 5 (d) K
 (e) None of these
55. How many such digits are there in the above sequence which are immediately preceded as well as followed by digits ?
 (a) None (b) One
 (c) Two (d) Three
 (e) None of these
56. In the following sequence or instructions, 1 stands for Run, 2 stands for Stop, 3 stands for Go, 4 stands for Sit and 5 stands for Wait. If the sequence is continued, which instruction will come next ?
 4 4 5 4 5 3 4 5 3 1 4 5 3 1 2 4 5 4 5 3 4 5 3
 (a) Wait (b) Sit
 (c) Stop (d) Run
 (e) None of these
57. In a certain code, a number 13479 is written as AQFJL and 2568 is written as DMPN. How is 396824 written in that code?
 (a) QLPNMJ (b) QLPNMF
 (c) QLPMNF (d) QLPNDF
 (e) None of these
58. In a certain code OVER is written as \$#%*. and VIST is written as #+×-. How is SORE written in that code?
 (a) ×\$*% (b) %×\$*
 (c) ×*\$% (d) ×%*
 (e) None of these
59. A boy goes to see a film and finds a man who is his relative. The man is the husband of the sister of his mother. How is the man related to the boy?
 (a) Brother (b) Nephew
 (c) Uncle (d) Father
 (e) None of these
60. Laxman went 15 km to the west from my house, then turned left and walked 20 km. He then turned East and walked 25 km and finally turning left covered 20 km. How far was he from my house?
 (a) 5 km (b) 10 km
 (c) 40 km (d) 80 km
 (e) None of these
61. DH is related to FG in the same way as LV is related to
 (a) NU (b) UN
 (c) VL (d) NO
 (e) None of these
62. 'Offhand' is related to 'premeditation' in the same way as 'above board' is related to
 (a) Integrity (b) Honesty
 (c) Guide (d) Competition
 (e) None of these
63. Rearrange the first four letters, in any way, of the word DECISION. Find how many words can be formed by using all the four words.
 (a) One (b) Two
 (c) Three (d) More than three
 (e) None of these
64. If the last four letters of the word 'CONCENTRATION' are written in reverse order followed by next two in the reverse order and next three in the reverse order and then followed by the first four in the reverse order, counting from the end which letter would be eighth in the new arrangement ?
 (a) N (b) T
 (c) E (d) R
 (e) None of these
65. Five boys took part in a race. Raj finished before Mohit but behind Gaurav. Ashish finished before Sanchit but behind Mohit. Who won the race?
 (a) Raj (b) Gaurav
 (c) Mohit (d) Ashish
 (e) None of these

DIRECTIONS (Qs. 66-70) : In each of the questions given below which one of the five answers figures should come after the problem figures, if the sequence were continued?

66. Problem figures

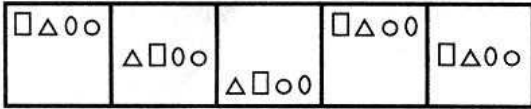


Answer figures

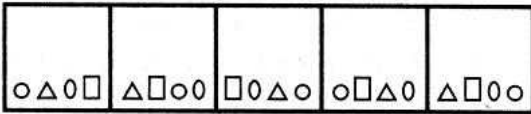


- (a) (b) (c) (d) (e)

67. Problem figures

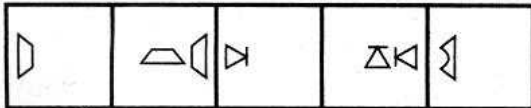


Answer figures

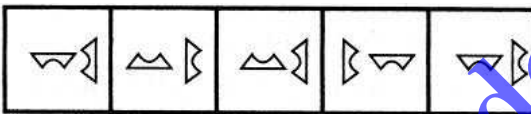


- (a) (b) (c) (d) (e)

68. Problem figures



Answer figures



- (a) (b) (c) (d) (e)

69. Problem figures

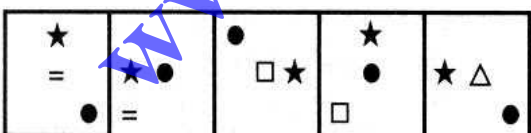


Answer figures

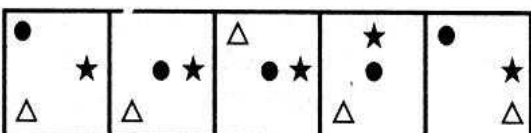


- (a) (b) (c) (d) (e)

70. Problem figures



Answer figures



ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-80) : Read the following passage carefully and answer the questions given below it.

Once upon a time there lived a vicious king, Raja Shankara—short-tempered and temperamental. "God I am" he said to his image as he stared into the mirror everyday, many times a day, He was obsessed with himself. He loved no one but himself. He was blinded towards the injustice in his kingdom because he had little time for his subjects. He wasted most of his time in pouring milk and honey over himself.

Interruption in his possessed life was dealt with stern reprimanding and sometimes on petty issues he would behead his servants. Provoked by his evil advisor Twishar, he went on with his self indulged life, unaware of the plot his very devoted advisor was planning. A plot to dethrone the king, rule the kingdom with his wicked ways only to harness wealth and the reputation of a king.

One morning the king went on his usual morning horseback rounds but returned with a very sad look on his face. He locked himself inside his palatial room only to unlock it at sundown. Just as the doors creaked open and Raja Shankara emerged from it, his wife rushed to embrace him. She feared a damaging incident had occurred.

The king spoke seldom that day and awoke the next day to make a proclamation to his servants and subjects. The whole kingdom feared what was in store for them from their angry king. But to their surprise he said to all gathered, "From now on I will be a different king. A softer and a patient king."

True to his words from that day on, the king had truly turned on a new leaf; he cleaned out the corruption and injustice in a tender manner with punishments aimed to renew the person from within.

One fine day his evil advisor gathered courage to ask the reason for his paradigm shift. And the king answered. When I went on horseback that morning a month ago, I noticed a dog brutally chasing a cat. The cat managed to sneak into a hole only after the dog bit her leg, maiming her for life. soon afterwards, the dog barked at a farmer who picked up a sharp stone and hit it straight in the dog's eye. Bleeding profusely, the dog yelped in pain. As the farmer walked on, he slipped on the edge of the road and broke his head.

All this happened in a matter of minutes before me and then I realized that evil begets evil. I thought about it deeply and was ready to give up my worldly life for the betterment of my subjects. I wanted to give up the evil in me as I did not want evil to encounter me.

Sniggering away the immoral advisor thought what a perfect time it was to dethrone the king, because the Raja had grown kind hearted and patient and would not endeavour a combat. Thinking how he would plan his attack, he stumbled over a step that took him hurling down the remaining steps, bringing him to a stop

with a crash. He howled in pain only to discover he had broken the bones in both his legs.

71. How can Raja Shankara be described before his transformation?
- He was unjust
 - He was preoccupied with himself
 - He was cruel
- (a) Only (1) (b) Only (2)
 (c) Only (3) (d) Only (1) and (2)
 (e) All the three (1), (2) and (3)
72. Why was the king not happy with the old Valuer?
- As the Valuer was not good at his work
 - As he had dishonoured the king
 - As the Valuer had been dishonest with the king about the prices that he set for goods
 - As the king believed that he was not earning much because of the Valuer's honesty
 - None of these
73. What proclamation did the Raja make to his subjects?
- That he was giving up his throne for the betterment of the kingdom
 - That his advisor would be the king from then on
 - That he would be a better king to them than he had been all this while
 - That his subjects were not good enough to deserve better treatment than what was already being meted out to them
 - None of these
74. What did Raja Shankara's wife think about the Raja's peculiar behaviour that particular day?
- She was afraid that something really bad had happened
 - She was afraid that the Raja would beat her up because of his unusual mood
 - She thought that he was in his usual sour mood
 - She thought that the Raja had received threats to his life from his servants
 - None of these
75. What was the reason for Raja Shankara's change in behaviour?
- His advisor's words had made him realize his mistake
 - He had felt bad for a poor family on his tour around his kingdom
 - His wife had betrayed him and hence he was upset
 - He had realized that doing good to people would bring good to him
 - He had realized that evil begets evil.
76. What can possibly be the moral of the story?
- Believe in yourself
 - Money is not everything in life
 - Don't trust people
 - Better late than never
 - As you sow so shall you reap
77. How did Raja Shankara treat all his servants if they interrupted him, before he changed into a good person?
- He treated all his servants with respect
 - He would scold them and sometimes cut their heads off over trivial issues
 - He would dismiss them from their duties never to be reinstated
 - He would rob them of all their possessions
 - None of these
78. What plan did Twishar have with regard to the Raja?
- He planned to take over the Raja's throne through devious means
 - He was a loyal servant to the Raja and always had his best interests in mind
 - He had plans to provoking the Raja into ruling the kingdom in more wicked ways
 - He planned to kill the raja with the help of the Raja's servants
 - None of these
79. Why did Twishar think that this was the best time to dethrone the Raja?
- As the Raja was sick, ailing and was on his deathbed
 - As he knew that the Raja had finally lost his mind
 - As he knew that the Raja had become a soft natured person and would not attempt to fight.
 - As he was sure that he would be able to convince that people of the kingdom that he Raja had become weak
 - None of these
80. What did the dog do to the cat?
- The dog chased the cat and sent it in the man's direction
 - The dog bit the cat's leg and crippled her for life
 - The dog killed the cat
 - Not mentioned in the passage
 - None of these

DIRECTIONS (Qs. 81-85) : Which of the phrases (a), (b), (c) and (d) given below each sentence should replace the phrase printed in bold in the sentence to make it grammatically correct? If the sentence is correct as it is given and no correction is required, mark (e) as the answer.

81. Her entry to the office party **was restrict** as an official enquiry had ben constituted against her.
- was restricting
 - is restricted
 - was restricted
 - is restricting
 - No correction required
82. Rima was **at her wit's end** trying to figure out what to buy for her frind's birthday.
- at her witting end
 - at her wit ends
 - to her wit's end
 - so wit's end
 - No correction required

83. Pritesh **while away his time** in playing games on the computer instead of studying.
- whiled away his time
 - whiled against his time
 - whiling away his time
 - while awayed his time
 - No correction required
84. Mohan **had make up his mind** about going on the world tour all alone.
- made minds
 - make his mind
 - make up his minding
 - made up his mind
 - No correction required
85. She rushed to the station but could **find any trace** of her daughter there.
- not found trace
 - find no trace
 - found not trace
 - finding no trace
 - No correction required

DIRECTIONS (Qs. 86-90) : In each question below, a sentence with four words printed in bold type is given. These are numbered as (a), (b), (c) and (d). One of these four words printed in bold may be either wrongly spelt or inappropriate in the context of the sentence. Find out the word which is wrongly spelt or inappropriate, if any. The number of that word is your answer. If all the words printed in bold are correctly spelt and also appropriate in the context of the sentence, mark (e) i.e., 'All correct' as your answer.

86. **Discussion** (a)/ is an exchange of **knowledge** (b)/ whereas **argument** (c)/ is a **depiction** (d)/ of ignorance. All correct (e).
87. He was **arrested** (a)/ for the **crime** (b)/ and was **charged** (c)/ with **attempt** (d)/ to murder. All correct (e).
88. **commit** (a)/ yourself to lifelong **learning** (b)/ as the most **valuable** (c)/ **asset** (d)/ you will have is your mind. All correct (e).
89. **Belive** (a)/ that life is **worth** (b)/ living and your belief will **create** (c)/ the **fact**. (d)/ All correct (e).
90. The best **educated** (a)/ human **being** (b)/ is the one who **understands** (c)/ most about the life in **which** (d)/ he is placed. All correct (e).

DIRECTIONS (Qs. 91-100) : In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are

suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

Once upon a time, two friends were (91) through the desert. During some point of the (92) they had an argument, and one friend slapped the other one in the face. The one who got slapped was (93), but without saying anything, he wrote in the sand, "Today my best friend slapped me in the face." They kept on walking (94) they found an oasis, where they (95) to take a both. The one, who had been slapped, got (96) in the quicksand and started drowning, but the friend saved him. After the friend (97) from the near drowning, he wrote on a stone, "The friend who had slapped and saved his best friend asked him, "After I hurt you, you wrote in the sand and (98) you write on a stone, why?" The other friend (99), "When someone hurts us, we should write it down in sand where winds of forgiveness can erase it away. But, when someone does something good for us, we must (100) it in stone where no wind can ever erase it."

91. (a) crawling (b) speaking
(c) swimming (d) walking
(e) dancing
92. (a) journey (b) sand
(c) running (d) border
(e) hunt
93. (a) dead (b) captured
(c) presentable (d) missing
(e) hurt
94. (a) as (b) until
(c) from (d) with
(e) through
95. (a) decided (b) fell
(c) made (d) want
(e) left
96. (a) home (b) stuck
(c) blended (d) mixed
(e) sitting
97. (a) separated (b) leaked
(c) died (d) recovered
(e) saved
98. (a) so (b) how
(c) when (d) tomorrow
(e) now
99. (a) called (b) tell
(c) replied (d) questioned
(e) asked
100. (a) talk (b) push
(c) engrave (d) add
(e) bury

RESPONSE SHEET

- | | | | | | | | | | |
|-----|-----------------|-----|-----------------|-----|-----------------|-----|-----------------|------|-----------------|
| 1. | (a)(b)(c)(d)(e) | 2. | (a)(b)(c)(d)(e) | 3. | (a)(b)(c)(d)(e) | 4. | (a)(b)(c)(d)(e) | 5. | (a)(b)(c)(d)(e) |
| 6. | (a)(b)(c)(d)(e) | 7. | (a)(b)(c)(d)(e) | 8. | (a)(b)(c)(d)(e) | 9. | (a)(b)(c)(d)(e) | 10. | (a)(b)(c)(d)(e) |
| 11. | (a)(b)(c)(d)(e) | 12. | (a)(b)(c)(d)(e) | 13. | (a)(b)(c)(d)(e) | 14. | (a)(b)(c)(d)(e) | 15. | (a)(b)(c)(d)(e) |
| 16. | (a)(b)(c)(d)(e) | 17. | (a)(b)(c)(d)(e) | 18. | (a)(b)(c)(d)(e) | 19. | (a)(b)(c)(d)(e) | 20. | (a)(b)(c)(d)(e) |
| 21. | (a)(b)(c)(d)(e) | 22. | (a)(b)(c)(d)(e) | 23. | (a)(b)(c)(d)(e) | 24. | (a)(b)(c)(d)(e) | 25. | (a)(b)(c)(d)(e) |
| 26. | (a)(b)(c)(d)(e) | 27. | (a)(b)(c)(d)(e) | 28. | (a)(b)(c)(d)(e) | 29. | (a)(b)(c)(d)(e) | 30. | (a)(b)(c)(d)(e) |
| 31. | (a)(b)(c)(d)(e) | 32. | (a)(b)(c)(d)(e) | 33. | (a)(b)(c)(d)(e) | 34. | (a)(b)(c)(d)(e) | 35. | (a)(b)(c)(d)(e) |
| 36. | (a)(b)(c)(d)(e) | 37. | (a)(b)(c)(d)(e) | 38. | (a)(b)(c)(d)(e) | 39. | (a)(b)(c)(d)(e) | 40. | (a)(b)(c)(d)(e) |
| 41. | (a)(b)(c)(d)(e) | 42. | (a)(b)(c)(d)(e) | 43. | (a)(b)(c)(d)(e) | 44. | (a)(b)(c)(d)(e) | 45. | (a)(b)(c)(d)(e) |
| 46. | (a)(b)(c)(d)(e) | 47. | (a)(b)(c)(d)(e) | 48. | (a)(b)(c)(d)(e) | 49. | (a)(b)(c)(d)(e) | 50. | (a)(b)(c)(d)(e) |
| 51. | (a)(b)(c)(d)(e) | 52. | (a)(b)(c)(d)(e) | 53. | (a)(b)(c)(d)(e) | 54. | (a)(b)(c)(d)(e) | 55. | (a)(b)(c)(d)(e) |
| 56. | (a)(b)(c)(d)(e) | 57. | (a)(b)(c)(d)(e) | 58. | (a)(b)(c)(d)(e) | 59. | (a)(b)(c)(d)(e) | 60. | (a)(b)(c)(d)(e) |
| 61. | (a)(b)(c)(d)(e) | 62. | (a)(b)(c)(d)(e) | 63. | (a)(b)(c)(d)(e) | 64. | (a)(b)(c)(d)(e) | 65. | (a)(b)(c)(d)(e) |
| 66. | (a)(b)(c)(d)(e) | 67. | (a)(b)(c)(d)(e) | 68. | (a)(b)(c)(d)(e) | 69. | (a)(b)(c)(d)(e) | 70. | (a)(b)(c)(d)(e) |
| 71. | (a)(b)(c)(d)(e) | 72. | (a)(b)(c)(d)(e) | 73. | (a)(b)(c)(d)(e) | 74. | (a)(b)(c)(d)(e) | 75. | (a)(b)(c)(d)(e) |
| 76. | (a)(b)(c)(d)(e) | 77. | (a)(b)(c)(d)(e) | 78. | (a)(b)(c)(d)(e) | 79. | (a)(b)(c)(d)(e) | 80. | (a)(b)(c)(d)(e) |
| 81. | (a)(b)(c)(d)(e) | 82. | (a)(b)(c)(d)(e) | 83. | (a)(b)(c)(d)(e) | 84. | (a)(b)(c)(d)(e) | 85. | (a)(b)(c)(d)(e) |
| 86. | (a)(b)(c)(d)(e) | 87. | (a)(b)(c)(d)(e) | 88. | (a)(b)(c)(d)(e) | 89. | (a)(b)(c)(d)(e) | 90. | (a)(b)(c)(d)(e) |
| 91. | (a)(b)(c)(d)(e) | 92. | (a)(b)(c)(d)(e) | 93. | (a)(b)(c)(d)(e) | 94. | (a)(b)(c)(d)(e) | 95. | (a)(b)(c)(d)(e) |
| 96. | (a)(b)(c)(d)(e) | 97. | (a)(b)(c)(d)(e) | 98. | (a)(b)(c)(d)(e) | 99. | (a)(b)(c)(d)(e) | 100. | (a)(b)(c)(d)(e) |

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Answer Key

1	(c)	11	(a)	21	(c)	31	(b)	41	(b)	51	(b)	61	(a)	71	(e)	81	(c)	91	(d)
2	(a)	12	(b)	22	(a)	32	(c)	42	(c)	52	(a)	62	(d)	72	(d)	82	(e)	92	(a)
3	(e)	13	(c)	23	(b)	33	(c)	43	(d)	53	(b)	63	(a)	73	(c)	83	(a)	93	(e)
4	(d)	14	(e)	24	(d)	34	(d)	44	(b)	54	(c)	64	(d)	74	(a)	84	(d)	94	(b)
5	(b)	15	(d)	25	(b)	35	(a)	45	(d)	55	(a)	65	(b)	75	(e)	85	(b)	95	(a)
6	(c)	16	(c)	26	(a)	36	(a)	46	(d)	56	(d)	66	(b)	76	(e)	86	(c)	96	(b)
7	(d)	17	(e)	27	(c)	37	(c)	47	(b)	57	(d)	67	(e)	77	(b)	87	(e)	97	(d)
8	(e)	18	(b)	28	(e)	38	(e)	48	(c)	58	(a)	68	(e)	78	(a)	88	(d)	98	(e)
9	(b)	19	(a)	29	(b)	39	(d)	49	(d)	59	(c)	69	(c)	79	(c)	89	(a)	99	(c)
10	(a)	20	(e)	30	(e)	40	(b)	50	(c)	60	(b)	70	(b)	80	(b)	90	(b)	100	(c)

Answers & Explanations

1. (c) $? = \frac{786 \times 64}{48} = 1048$

2. (a) $\sqrt[3]{13824} \times \sqrt{?} = 864$
 $\sqrt[3]{24 \times 24 \times 24} \times \sqrt{?} = 864$
 $\Rightarrow 24 \times \sqrt{?} = 864$

$$\Rightarrow \sqrt{?} = \frac{864}{24}$$

$$\therefore ? = 36 \times 36 = 1296$$

3. (e) $\frac{60}{100} \times \frac{20}{100} \times \frac{3}{5} \times ? = 450$
 $\Rightarrow \frac{9}{125} \times ? = 450$
 $\Rightarrow ? = \frac{450 \times 125}{9} = 6250$

4. (d) $? = 196 \times 948 \div 158 = \frac{196 \times 948}{158} = 1176$

5. (b) $? = 3.5 + 11.25 \times 4.5 - 32.5$
 $= 3.5 + 50.625 - 32.5 = 54.125 - 32.5 = 21.625$

6. (c) $? = \frac{\sqrt{4096} \times 56}{764 - 652} = \frac{64 \times 56}{112} = 32$

7. (d) $? = (98360 + 25845 - 36540) \div 2500$
 $= 87665 \div 2500 = 35.066$

8. (e) $? = 7414 + 3698 + 1257 + 1869 = 14238$

9. (b) $(91)^2 + (41)^2 - \sqrt{?} = 9858$
 $\Rightarrow 8281 + 1681 - \sqrt{?} = 9858$
 $\Rightarrow \sqrt{?} = 9962 - 9858 = 104$
 $\therefore ? = 104 \times 104 = 10816$

10. (a) $? = (2640 \div 48) \times (2240 \div 35)$
 $= 55 \times 64 = 3520$

11. (a) $\frac{121}{-2^2} \quad \frac{117}{-3^2} \quad \frac{108}{-4^2} \quad \frac{92}{-5^2} \quad \frac{67}{-6^2} \quad \boxed{31}$

12. (b) $\frac{50}{\div 2+1} \quad \frac{26}{\div 2+1} \quad \frac{14}{\div 2+1} \quad \frac{8}{\div 2+1} \quad \frac{5}{\div 2+1} \quad \frac{3.5}{\div 2+1}$

13. (c) $\frac{3}{+20} \quad \frac{23}{+20} \quad \frac{43}{+20} \quad \frac{63}{+20} \quad \frac{83}{+20} \quad \frac{103}{+20}$

14. (e) $\frac{748}{-11} \quad \frac{737}{-22} \quad \frac{715}{-33} \quad \frac{682}{-44} \quad \frac{638}{-55} \quad \boxed{583}$

15. (d) $\begin{matrix} 1 & 9 & 25 & 49 & 81 & \boxed{121} & 169 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ 1^2 & 3^2 & 5^2 & 7^2 & 9^2 & 11^2 & 13^2 \end{matrix}$

16. (c) Let the number of ducks and frogs in the pond be $37x$ and $39x$ respectively.

ATQ,

$$\frac{37x + 39x}{2} = 152$$

$$\Rightarrow 38x = 152 \Rightarrow x = \frac{152}{38} = 4$$

$$\therefore \text{Number of frogs} = 39x = 39 \times 4 = 156$$

17. (e) The number of employees in companies A, B and C be $4x$, $5x$ and $6x$ respectively

After increase in the number of employees, required ratio will be

$$= 4x \times \frac{125}{100} : 5x \times \frac{130}{100} : 6x \times \frac{150}{100}$$

$$= 4 \times 25 : 5 \times 26 : 6 \times 30$$

$$= 10 : 13 : 18$$

18. (b) According to the questions, third number will be
 $= 5 \times 213 - 2 \times 233.5 - 2 \times 271$
 $= 1065 - 467 - 542 = 56$

19. (a) Let Sonali's monthly income = ₹ x
 Sonali's percentage monthly spendings
 $= (55 + 15)\% = 70\%$

$$\text{Percentage savings} = 100 - 70 = 30\%$$

ATQ,

$$\therefore 30\% \text{ of } x = 12750$$

$$\Rightarrow x = \frac{12750 \times 100}{30} = ₹ 42500$$

20. (e) $C.I. = P \left[\left(1 + \frac{r}{100} \right)^t - 1 \right] = 9650 \left[\left(1 + \frac{6}{100} \right)^3 - 1 \right]$
 $= 9650 (1.191016 - 1)$
 $= 9650 \times 0.191016 \approx ₹ 1843$

21. (c) The rate of milk when milkman sells 120 litres of milk for ₹ 3360

$$\therefore SP = \left(\frac{3360}{120} \right) = ₹ 28$$

The rate of milk when milkman sells 240 litres of milk for ₹ 6120.

$$\therefore SP = \left(\frac{6120}{240} \right) = ₹ 25.5$$

$$\therefore \text{Required discount} = (28 - 25.5) = ₹ 2.5$$

22. (a) Let the number be x .

$$\text{ATQ, } \frac{3626}{x^2} \times 32 = 2368$$

$$\Rightarrow x^2 = \frac{3626 \times 32}{2368} = 49$$

$$\therefore x = \sqrt{49} = 7$$

23. (b) Let the two digits number be $10n + m$ and $n > m$.

As given,

$$n + m = 14$$

$$n - m = 2$$

On solving the equation,

$$n = 8, m = 6$$

$$\therefore \text{Product of digits} = 8 \times 6 = 48$$

24. (d) After servicing, speed of car = 60 km/h

$$\therefore \text{Distance covered in 6 hours}$$

$$= (60 \times 6) \text{ km} = 360 \text{ km}$$

Before servicing, time taken to cover 360 km

$$\therefore \text{Time taken} = \frac{360 \text{ km}}{50 \text{ km/h}} = 7.2 \text{ hours}$$

25. (b) Let Venkat has x ducks and y sheep.

$$\therefore x + y = 81$$

$$\therefore x = 81 - y \quad \dots(i)$$

$$\text{and } 2x + 4y = 268$$

$$\Rightarrow 162 - 2y + 4y = 268$$

$$\Rightarrow 2y = 268 - 162 = 106$$

$$\Rightarrow y = \frac{106}{2} = 53$$

\therefore Number of sheep = 53

26. (a) $x + y = 13 \quad \dots(i)$

$$x - y = 3 \quad \dots(ii)$$

On adding,

$$2x = 16$$

$$\Rightarrow x = 8$$

$$\therefore y = 5$$

\therefore Numbers are 85 and 58.

27. (c) Length of the reel

$$= (25 \times 125 + 90) \text{ cm}$$

$$= 3215 \text{ cm} = 32.15 \text{ m}$$

28. (e) $17 \times 17 = 289$

$$19 \times 19 = 361$$

29. (b) Let the CP of the shoes be ₹ x .

$$\therefore 2033 - x = x - 1063$$

$$\Rightarrow 2x = 2033 + 1063 = 3096$$

$$\Rightarrow x = \frac{3096}{2} = ₹ 1548$$

30. (e) Amount received by each person

$$= ₹ \left(\frac{158965}{120} \right) = ₹ 1325$$

31. (b) Total number of users of brand B across all Five cities

$$= 600 + 500 + 650 + 700 + 550 = 3000$$

32. (c) $700 = x\% \text{ of } 500$

$$700 = \frac{x \times 500}{100} \Rightarrow x = \frac{700}{5} = 140$$

33. (c) Required average = $\frac{500 + 550 + 600 + 550 + 700}{5}$

$$= 580$$

34. (d) Required difference = $1250 - 1100 = 150$

35. (a) Required Ratio = $\frac{500}{700} = 5:7$

36. (a) **Statements** : All books are notes.

Conclusions : Some books are notes.

(Implication)

Some notes are books.

(conversion)

Hence I follows.

Statements : Some notes are pencils.

No pencil is paper.

Conclusions : Some note are not paper.

(I + E = O type)

Statements : Some notes are pencils.

Conclusions : Some pencils are notes.

(conversion)

Statements : No pencil is paper.

Conclusions : Some pencils are not papers.
(Implication)
No paper is pencil.
(Conversion)

Since III and IV form a complementary I-E pair, either of the two must follow.

37. (c) **Statements** : Some tables are chairs.
Conclusions : Some chairs are tables.
(conversion)
Hence, III follows.

Statements : No cupboard is table.
Conclusions : Some cupboards are not table.
(Implication)
No table is cupboard.
(conversion)

Statements : Some chairs are cupboards.
Conclusions : Some cupboards are chairs.
(conversion)
Since, No table is cupboard.
Some cupboards are chairs.

Conclusions : Some chairs are not table.
(E + I = O* type)
Hence, I follows.

38. (e) **Statements** : No table is fruit.
Conclusions : Some tables are not fruit.
(Implication)
No fruit is table. (conversion)

Statements : No fruit is window.
Conclusions : Some fruits are not window.
(Implication)
No window is fruit.
(Conversion)

Statements : No fruit is window
All windows are chairs.
Conclusions : Some chairs are not fruit.
(E + A = O* type)

Statements : All windows are chairs.
Conclusions : Some windows are chairs.
(Implication)
Some chairs are windows.
(Conversion)

39. (d) **Statements** : No man is sky.
Conclusions : Some men are not sky.
(Implication)
No sky is man. (conversion)

Statements : No sky is road.
Conclusions : Some skies are not road.
(Implication)
No road is sky. (conversion)

Hence II follows.

Statements : Some men are roads.
Conclusions : Some roads are men.
(conversion)
No sky is man.

Some men are roads.

Some roads are not sky.
(E + I = O* type)
No sky is road.

Some roads are men.
Some men are not sky.
(E + I = O* type)

Statements : Some men are roads.

Conclusions : No road is sky.
Some men are not sky.
(I + E = O type)

Statements : Some roads are man.

Conclusions : No man is sky.
Some roads are not sky.
(I + E = O type)

Hence, only II follows.
40. (b) **Statements** : All papers are books.
Conclusions : Some papers are books.
(Implication)
Some books are papers.
(conversion)

Hence II follows.
Statements : All bags are books.
Conclusions : Some bags are books.
(Implication)
Some books are bags.
(conversion)

Statements : Some purses are bags.
Conclusions : Some bags are purses.
(conversion)

Statements : Some purses are bags.

Conclusions : All bags are books.
Some purses are books.
(I + A = I-type)
Some books are purses.
(conversion)

Hence, III follows.

41. (b) Here, $T > K$... (i)
 $K \leq R$... (ii)
 $R = M$... (iii)

From (ii) and (iii), we get

$R = M \geq K$... (iv)

Now, from (iv) we get $M > K$ (conclusion III) for $M = K$ (conclusion I). Hence, either conclusion I or conclusion III follows. Again, from (i) and (iv) we can't get any

specific relationship between 'M' and 'T'. Hence, conclusion II does not follow.

42. (c) Here, $M < R$... (i)
 $R \leq T$... (ii)
 $T = N$... (iii)
 From (i), (ii) and (iii), we get
 $T = N \geq R > M$... (iv)

Hence, from (iv) we get $N = R$ (conclusion I) or $N > R$ (conclusion II). Hence, either conclusion I or conclusion II follows. Also, from (iv) we get $N > M$ (conclusion III). Hence, conclusion III follows.

43. (d) Here, $V \geq M$... (i)
 $A > M$... (ii)
 $R \leq V$... (iii)

From (i) and (ii), we can't get any specific relationship between 'V' and 'A'. Hence, conclusion II does not follow. Again from (i) and (iii), we can't get any specific relationship between 'M' and 'R'. Hence, conclusion III does not follow. On the similar basis we can't get any specific relationship between 'A' and 'R' using all (i), (ii) and (iii). Hence, conclusion I does not follow.

44. (b) Here, $B = D$... (i)
 $D \geq H$... (ii)
 $H < F$... (iii)

From (i) and (ii), we get
 $B = D \geq H$... (iv)

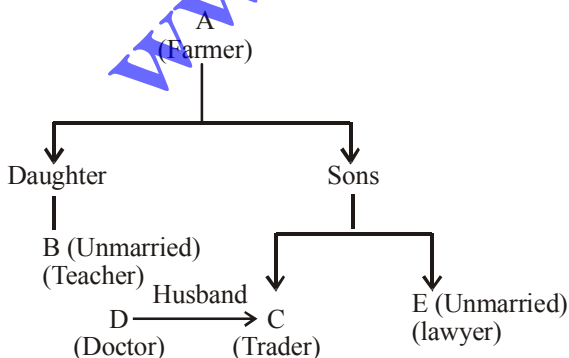
Now, from (iii) and (iv), we can't get any specific relationship between B and F (or D and F). Hence, no conclusion follows. But, conclusion I and II make a complementary pair. Hence, either conclusion I or conclusion II follows.

45. (d) Here, $J \leq N$... (i)
 $K \geq N$... (ii)
 $T > K$... (iii)

From (i), (ii) and (iii), we get
 $T > K \geq N \geq J$... (iv)

From (iv), we get $J < T$ (conclusion I) and $T > N$ (conclusion II). Hence, conclusion I and conclusion II follow. Conclusion III can be obtained from conversion of (i). Hence, conclusion III follows.

For (Qs. 46-50)



46. (d) Clearly, B and D are the females members in the family.
 47. (b) From the above table C and D the married couple.
 48. (c) C and E are the male members in the family.
 49. (d) D, the wife of the trader C is the doctor in the family.
 50. (c) C is the trader in the family.
 51. (b) E G 4 B H 7 5 @ K 8 D N £ Q Z \$ W 3 C 1 9 * 1 B 2 S 6
 52. (a) The first, second and third element of each group is sixth element to the right of the respective element of previous group as given in all in the sequence.

53. (b) There are 27 elements in all in the sequence. So, $(27 - 9 - 7 =)$ 11 elements are between the 9th from left and 7th from right. Hence, $(9 + 6 =)$ 15th element from the left and will be the required answer.

54. (c) 7th to the left of 12th from right
 $= (12 + 7 =)$ 19th from right
 $= (27 - 19 + 1 =)$ 9th from left
 But the first 15 elements are reversed.
 $= (15 - 9 + 1 =)$ 7th from left in the original sequence = 5.

55. (a) For the condition to be fulfilled, three digits should be together but it is not so in the given sequence.
 56. (d) 4, 45, 453, 4531, 45312, 45, 453, 4531
 The next coded digit will be 1. Hence, the instruction Run will come next.

57. (d)

1	3	4	7	9	2	5	6	8
A	Q	F	J	L	D	M	P	N

Thus,

3	9	6	8	2	4
Q	L	P	N	D	F

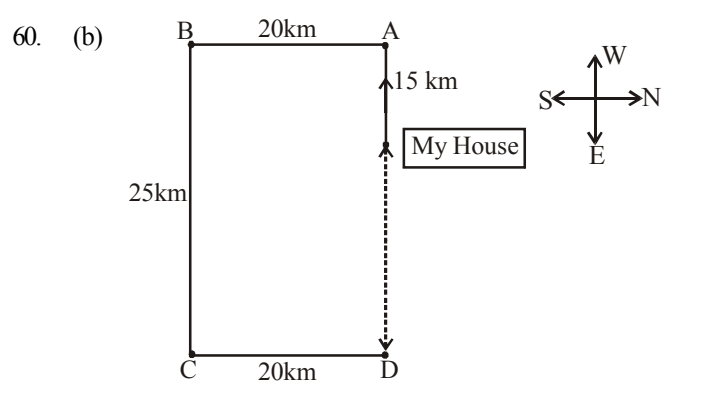
58. (a)

O	V	E	R	V	I	S	T
\$	#	%	*	#	+	×	-

From above table, SORE is coded as :

S	O	R	E
×	\$	*	%

59. (c) The sister of one's mother is one's maternal aunt. Hence the man is the husband of the boy's maternal aunt.



From the above diagram required distance = $25 - 15 = 10$ km.

62. (d) 'Offhand' means fairness in 'premeditation.' 'above board' has the same sense with the term competition.
63. (a) The first four letters are D, E, C, I and only word DICE can be formed so the answer is (a).
64. (d) The new letter sequence is
NOITARTNECNOC
The eighth letter from the end is R.
65. (b) The order in which the five boys reach the finishing line is Gaurav, Raj, Mohit, Ashish, Sanchit.
Hence Gaurav won the race.
66. (b) In each successive problem figure design 'T' rotates anticlockwise through 45° , 90° , 45° , 90° respectively and a new design of its left and then right is added respectively. Thus the answer figure (e) is obtained.
67. (e) From problem figures 1 to 4 two designs of right change their places with each other and from problem figure 2 to 5, two designs of left change their places with each other. In the same way from problem figure 3 to 6 two designs of right will change their places with each other. Thus the answer figure (e) is obtained.
68. (e) From problem figure 1 to 2 and 3 to 4 the design turning over horizontally situates toward right side and the design rotating through 90° anticlockwise situates in the middle. As per this rule the answer figure (e) is obtained.
69. (c) In each subsequent figure design change their places as below:



From problem 1 to 2 designs 1 and 2

From problem 2 to 3 designs 3 and 4

From problem 3 to 4 designs 5 sets up at top

From problem 4 to 5 designs 1 and 2

and 5 to 6 design 3 and 4 change their places with each other thus the answer figure (c) is obtained.

70. (b) In the consecutive figure, the design '•' comes at middle from lower right, at upper left from middle and then at middle. The design '★' comes at left middle from upper middle, at right from left middle and at upper middle from right middle. A new design comes lower left from middle.

4

PRACTICE SET

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $1/4^{\text{th}}$ of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-5) : What should come in place of question mark (?) in the following number series?

- 36 20 ? 8 6 5
(a) 10 (b) 12
(c) 14 (d) 16
(e) None of these
- 668 656 632 584 ? 296
(a) 392 (b) 438
(c) 488 (d) 536
(e) None of these
- 1 121 441 961 1681 ?
(a) 2701 (b) 2511
(c) 2611 (d) 2801
(e) None of these
- 9 49 201 1009 ? 20209 80841
(a) 4054 (b) 4049
(c) 4050 (d) 4041
(e) None of these
- 31 35 44 60 85 ?
(a) 121 (b) 111
(c) 109 (d) 97
(e) None of these
- The average of five positive numbers is 308. The average of first two numbers is 482.5 and the average of last two numbers is 258.5. What is the third number?
(a) 224 (b) 58
(c) 121 (d) Cannot be determined
(e) None of these
- Sophia invests 25% of her monthly salary in insurance policies. She spends 15% of her monthly salary in shopping and 35% of her salary on household expenses. She saves the remaining amount of ₹ 9,050. What is Sophia's annual income?
(a) ₹ 84,500 (b) ₹ 5,30,000
(c) ₹ 3,25,200 (d) ₹ 4,34,400
(e) None of these
- The number of employees in companies A, B and C are in a ratio of 3 : 2 : 4 respectively. If the number of employees in the three companies is increased by 20%, 30% and 15% respectively, what will be the new ratio of employees working in companies A, B and C respectively?
(a) 18 : 13 : 24 (b) 13 : 18 : 23
(c) 17 : 3 : 23 (d) 18 : 11 : 23
(e) None of these
- The ages of Vaibhav and Jagat are in the ratio of 12 : 7 respectively, After 6 years the ratio of their ages will be 3 : 2. What is the difference in their ages?
(a) 8 years (b) 12 years
(c) 9 years (d) 10 years
(e) None of these
- What is the least number to be added to 8008 to make it a perfect square?
(a) 273 (b) 87
(c) 264 (d) 92
(e) None of these
- The product of two consecutive odd numbers is 6723, What is the square root of the smaller number?
(a) 9 (b) 729
(c) 6561 (d) 81
(e) None of these

12. 60 per cent of first number is 40 per cent of the second number. What is the respective ratio of the first number to the second number?
 (a) 2 : 3 (b) 21 : 31
 (c) 7 : 10 (d) Cannot be determined
 (e) None of these
13. The owner of a book shop charges his customer 28% more than the cost price. If a customer paid ₹ 1,408 for some books, then what was the cost price of the books ?
 (a) ₹ 1,100 (b) ₹ 1,111
 (c) ₹ 1,110 (d) ₹ 1,000
 (e) None of these
14. The difference between 56% of a number and 39% of the same number is 425. What is 63% of that number?
 (a) 1525 (b) 1650
 (c) 1700 (d) 1575
 (e) None of these
15. Find the average of the following set of scores:
 456, 328, 489, 453, 511, 328, 222, 205
 (a) 374 (b) 388
 (c) 362 (d) 391
 (e) None of these

DIRECTIONS (Qs. 16-20) : What approximate value should come in place of the question mark (?) in the following questions? (You are not expected to calculate the exact value.)

16. $[(1.3)^2 \times (4.2)^2] \div 2.7 = ?$
 (a) 7 (b) 21
 (c) 18 (d) 11
 (e) 16
17. $746 \div 32 \times 15 = ?$
 (a) 350 (b) 345
 (c) 355 (d) 340
 (e) 335
18. $\sqrt{834} \times \sqrt{349} = ?$
 (a) 525 (b) 556
 (c) 534 (d) 550
 (e) 540
19. $(3986 + 2416 + 3897) \div 754 = ?$
 (a) 18 (b) 14
 (c) 11 (d) 9
 (e) 21
20. $41.25 + 11.085 \times 2.75 = ?$
 (a) 63 (b) 67
 (c) 76 (d) 72
 (e) 80
- (d) if $x \leq y$
 (e) if $x = y$ or the relationship cannot be established
21. I. $12x^2 + 11x + 12 = 10x^2 + 22x$
 II. $13y^2 - 18y + 3 = 9y^2 - 10y$
22. I. $\frac{18}{x^2} + \frac{6}{x} - \frac{12}{x^2} = \frac{8}{x^2}$
 II. $y^3 + 9.68 + 5.64 = 16.95$
23. I. $\sqrt{1225x} + \sqrt{4900} = 0$
 II. $(81)^{1/4}y + (343)^{1/3} = 0$
24. I. $\frac{(2)^5 + (11)^3}{6} = x^3$
 II. $4y^3 = -(589 \div 4) + 5y^3$
25. I. $(x^{7/5} \div 9) = 169 \div x^{3/5}$
 II. $y^{1/4} \times y^{1/4} \times 7 = 273 \div y^{1/2}$

DIRECTIONS (Qs. 26-30) : What should come in place of the question mark (?) in the following questions?

26. $(84)^2 - (67)^2 + \sqrt{7} = 2588$
 (a) 361 (b) 529
 (c) 441 (d) 625
 (e) None of these
27. $668 \div 167 \times 284 = ?$
 (a) 1156 (b) 1136
 (c) 1096 (d) 1116
 (e) None of these
28. $\sqrt[3]{10648} \times \sqrt[3]{5832} = ?$
 (a) 396 (b) 216
 (c) 432 (d) 576
 (e) None of these
29. 60% of 25% of $\frac{5}{6}$ th of ? = 630
 (a) 5060 (b) 5200
 (c) 4880 (d) 4500
 (e) None of these
30. $(85410 + 36885 + 24705) \div 1600 = ?$
 (a) 90.25 (b) 94.386
 (c) 95.50 (d) 91.875
 (e) None of these
31. What amount of compound interest can be obtained on an amount of ₹ 8, 840 at the rate of 5% p.a at the end of 3 years?
 (a) ₹ 1,393.405 (b) ₹ 1,326
 (c) ₹ 1,384.50 (d) ₹ 1340
 (e) None of these
32. A trader sells 150 metres of cloth for ₹ 6, 600 and he sells 300 metres of cloth for ₹ 12, 750. How much concession does the trader give per metre of cloth, when he sells 300 metres of cloth?
 (a) ₹ 3 (b) ₹ 2.5
 (c) ₹ 1.5 (d) ₹ 2
 (e) None of these

DIRECTIONS (Qs. 21-25) : In the following questions, two equations numbered I and II are given. You have to solve both the equations and give answers.

- (a) if $x > y$
 (b) if $x \geq y$
 (c) if $x < y$

33. When 3888 is divided by the square of a number and the answer so obtained is multiplied by 21, the final answer so obtained is 252. What is the number?
 (a) 324 (b) 16
 (c) 256 (d) 144
 (e) None of these
34. The sum of the digits of a two digit number is 14. The difference between the first digit and the second digit of the two digit number is 4. What is the two digit number?
 (a) 86 (b) 95
 (c) 68 (d) 77
 (e) None of these
35. A car runs at the speed of 40 when not serviced and runs at 65 kmph. when serviced. After servicing, the car covers a certain distance in 5 hours. How much **approximate** time will the car take to cover the same distance when not serviced?
 (a) 10 (b) 7
 (c) 12 (d) 8
 (e) 6
41. In a school, the following codes were used during physical exercise. 1 means start walking, 2 means keep standing, 3 means start running at the same spot, 4 means sit down. How many times a student, who performs the following sequence without error from the beginning to the end, has to sit down?
 1 2 3 4 2 3 1 4 4 3 2 2 1 2 4 3 1 4 4 1 2
 (a) 2 (b) 3
 (c) 6 (d) 5
 (e) None of these
42. ENGLAND is written as 1234526 and FRANCE as 785291. How will GREECE be written in this coding scheme?
 (a) 381191 (b) 381911
 (c) 394132 (d) 562134
 (e) None of these
43. If table is called chair, chair is called cot, cot is called pot and pot is called filter, where does a person sit?
 (a) pot (b) cot
 (c) chair (d) filter
 (e) None of these
44. Pointing to a photograph Arun said, 'She is the mother of my brother's son's wife's daughter.' How is Arun related to the lady's husband?
 (a) Uncle (b) Daughter-in-law
 (c) Cousin (d) Brother
 (e) None of these
45. Five boys are standing in a row facing East. Deepak is to the left of Sameer, Tushar and Shailendra. Sameer, Tushar and Shailendra are to the left of Sushil. Shailendra is between Sameer and Tushar. If Tushar is fourth from the left, then how far is Sameer from the right?
 (a) First (b) Second
 (c) Third (d) Fourth
 (e) None of these

REASONING ABILITY

36. 'Talk' is related to 'Speak' in a certain way. Similarly, 'Honest' is related to 'Truthful'. Following the same logic, 'Listen' is related to '.....'.
 (a) Music (b) Ears
 (c) Hear (d) Ignore
 (e) Sound
37. Three of the following are alike in a certain way and form a group. Find the odd one out.
 (a) Bird (b) Insect
 (c) Aeroplane (d) Kite
 (e) None of these
38. Arrange the given words in alphabetical order and tick the one that comes in the middle.
 (a) Restrict (b) Rocket
 (c) Robber (d) Random
 (e) Restaurant
39. Select the combination of numbers so that letters arranged accordingly will form a meaningful word.
 R A C E T
 1 2 3 4 5
 (a) 1, 2, 3, 4, 5 (b) 3, 2, 1, 4, 5
 (c) 5, 2, 3, 4, 1 (d) 5, 1, 2, 3, 4
 (e) None of these
40. Veena walked 5m towards north, took a left turn and walked 7 m. She took a left turn again and walked 8m before taking a left turn and walking 7 m. She then took a final left turn and walked 1 m before stopping. How far is Veena from the starting point?
 (a) 3m (b) 6m
 (c) 4m (d) 2m
 (e) 7m
- DIRECTIONS (Qs. 46-50) : In each of the questions below are given three statements followed by the conclusions numbered I, II, III & IV. You have to take the given statements to be true even if they seem to be at variance with commonly known facts and then decide which of the given conclusions logically follow from the given statements. Give answer**
46. **Statements** : Some pots are buckets.
 Some buckets are bags.
 Some bags are purses.
- Conclusions** : I. Some purses are buckets.
 II. Some bags are pots.
 III. Some purses are pots.
 IV. Some pots are bags.
- (a) All follow (b) None follows
 (c) Only I and III follow (d) Only II and IV follow
 (e) None of these

47. **Statements** : All glasses are roads.
No road is stick.
Some sticks are pens.
- Conclusions** : I. Some glasses are sticks.
II. Some pens are sticks.
III. Some roads are sticks.
IV. No glass is a stick.
- (a) None follows
(b) Only I or IV and II follow
(c) Only either I or II and IV follows
(d) Either I or II follows
(e) None of these
48. **Statements** : Some ice is ring.
No ring is paint.
Some rings are gold.
- Conclusions** : I. No gold is paint.
II. No ice is gold.
III. Some rings are paints.
IV. All golds are ring.
- (a) None follows (b) Only I and III follow
(c) Only I and II follow (d) Only III and IV follow
(e) None of these
49. **Statements** : No candle is bell.
Some shoes are bells.
All tables are shoes.
- Conclusions** : I. Some tables are bells.
II. No table is bell.
III. Some shoes are candles.
IV. No flower is fruit.
- (a) Only I and IV follow (b) Only I and II follow
(c) Only III and IV follow (d) Either II or III follows
(e) None of these
50. **Statements** : Some cats are rats.
Some rats are ants.
Some ants are flies.
- Conclusions** : I. Some flies are ants.
II. Some ants are not rats.
III. No rat is fly.
IV. No cat is fly.
- (a) Only I and IV follow (b) Only II follows
(c) Only I and II follow (d) Only IV follows
(e) None of these
51. If one neighbour of A is D, then who is the other one ?
(a) B (b) C
(c) E (d) F
(e) None of these
52. Who is placed opposite to E ?
(a) F (b) D
(c) C (d) B
(e) None of these
53. Who is at the same distance from D as E is from D ?
(a) B (b) C
(c) D (d) F
(e) None of these
54. Which of the following is not a correct neighbouring pair ?
(a) B & F (b) C & F
(c) D & F (d) A & E
(e) None of these
55. Which of the following is not a correct neighbouring triplet?
(a) B, C, F (b) A, F, B
(c) D, A, B (d) F, A, E
(e) None of these

DIRECTIONS (Qs. 56-61) : In each of the questions given below a group of digits is given followed by four combinations of letters/symbols. You have to find out which of the four combinations correctly represents the group of digits based on the letter/symbol codes and the conditions given below. If none of the four combinations represents the group of digits correctly, give (e) i.e. "None of these" as the answer.

Digit:	3	9	6	2	8	7	5	4	1
Symbol :	K	T	\$	F	H	#	%	D	M

Conditions for the coding the group of digits:

- If the first digit is odd and last digit is even, the codes for the first and the last digits are to be interchanged.
 - If the first as well as the last digit is even, both are to be coded by the code for last digit.
 - If the first as well as the last digit is odd, both are to be coded as 'X'.
56. **564923**
(a) %\$DTFK (b) K\$DTFK
(c) X\$DTFX (d) K\$DTF%
(e) None of these
57. **658247**
(a) %\$HFD# (b) #HFD\$
(c) %\$HFD# (d) %\$HFD\$
(e) None of these
58. **436958**
(a) DK\$T%D (b) DK\$T%H
(c) HK\$T%H (d) #H\$K#
(e) None of these
59. **756834**
(a) #H\$K# (b) D\$H\$K#
(c) D\$H\$K# (d) #H\$K#
(e) None of these

DIRECTIONS (Qs. 51-55) : On the basis of the following information, answer the questions that follow.

Six people are sitting on the ground in a hexagonal shape. The hexagon's vertices are marked as A, B, C, D, E and F but not in any order. However, all the sides of the hexagon are of same length. A is not adjacent to B or C; D is not adjacent to C or E; B and C are adjacent; F is in the middle of D and C.

60. **291378**
 (a) FTMK#H (b) XTMK#X
 (c) HTMK#F (d) FTMK#F
 (e) None of these
61. **128547**
 (a) XFH%DX (b) XFH#DX
 (c) MFH%DX (d) XFH%D#
 (e) None of these

DIRECTIONS (Qs. 62-65) : In the following questions the symbols \$, @, *, # and ? are used with the following meanings.

A \$ B means A is greater than B.

A @ B means A is either greater than or equal to B.

A * B means A is equal to B.

A # B means A is smaller than B.

A ? B means A is either smaller than or equal to B.

Now in each of the following questions assuming the given statements to be true, find which of the two conclusions I and II given below them is/are definitely true? Given answer

- (a) If only conclusion I is true.
 (b) If only conclusion II is true.
 (c) If neither I nor II is true.
 (d) If both I and II are true.
 (e) None of these
62. **Statements** : M # N, T \$ U, N # U
Conclusions : I. M ? T
 II. T \$ N
63. **Statements** : P \$ T, G ? N, T @ N
Conclusions : I. P \$ N
 II. G ? T
64. **Statements** : P ? Q, R \$ S, Q @ S
Conclusions : I. P \$ S
 II. R # Q
65. **Statements** : D @ F, G \$ H, F ? H
Conclusions : I. G \$ F
 II. D @ H

DIRECTIONS (Qs. 66-70) : Study the following arrangement carefully and answer the questions given below :

P 1 % T R A 5 # D M 7 K ★ E G 2 \$ S H 3 1 4 V U 6 F † 9 Z

66. How many such symbols are there in the above arrangement, each of which is immediately preceded by a consonant and also immediately followed by a consonant ?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
67. Four of the following five are alike in a certain way based on their position in the above arrangement. Which is the one that **does not** belong to that group ?
 (a) VIF (b) EK8
 (c) R % # (d) 6V9
 (e) \$G3
68. How many such vowels are there in the above arrangement, each of which is immediately preceded by a digit and immediately followed by a consonant ?

- (a) None (b) One
 (c) Two (d) Three
 (e) More than three
69. Which of the following is exactly in the middle between the fifth element from the left end and the seventh element from the right end?
 (a) G (b) 2
 (c) E (d) ★
 (e) None of these
70. If the positions of last twelve elements in the above arrangement are reversed, which of the following will be the eighth element to the right of the eleventh element from the left ?
 (a) H (b) I
 (c) † (d) 9
 (e) None of these

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-75) : Read the following passage carefully and answer the questions given below it.

Govind's father was a rich landlord, who was loved and respected by all his tenants. When he died, he left large tracts of land to Govind. But Govind did not spend a single day looking after his land. He had a funny idea, that there existed a magic potion which, if it was poured on any object, would turn it into gold. He spent all his time trying to learn more about this potion. People took advantage of him and cheated him. His wife grew anxious. Given the amount of money Govind was spending, she was sure that they would soon be paupers.

One day, a widely respected sage who had been to the Himalayas came to their town. Govind asked him about the potion. To his surprise the sage answered, "I have learnt how to brew such a potion. But it is a difficult process." "Tell me!" insisted Govind, hardly able to believe his luck. "You have to collect the dew which settles on the leaves of a banana tree every morning during winter. There is a condition, though. The tree should be planted and watered regularly with your own hands. Store the collected dew in an earthen vessel and when you have five litres, bring it to me. I will recite a sacred mantra to transform the dew into the potion. A drop of the potion will be sufficient to change any object into gold."

Govind was worried "Winter is only for a few months in the year. It will take me years to collect the dew." "You can plant as many trees as you want," replied the sage. Govind went home and after talking to his wife, began clearing the large fields which has been lying vacant for years. He planted rows of banana saplings. He tended them with great care. His wife helped him too. She would take the banana crop to market and get a good price. Over the years the plantation grew and finally after six years Govind had five litres of dew. He went to the sage who smiled, uttered a mantra and sprinkled a few drops of dew on a copper vessel. To Govind's dismay, nothing happened. "you have cheated me!" he shouted at the sage.

The sage however smiled. Govind's wife then came forward with a box. The sage opened it and revealed stacks of gold coins inside. Turning to Govind he said, "you worked hard on your land and created a plantation. Your wife sold the produce in the market. It was your hard work which created this wealth, not magic. If I had told you this earlier, you would not have listened." Govind understood the wisdom behind the sage's words and worked even harder from that day on.

71. Why did Govind's father give him large tracts of land?
- It was his way of instilling a sense of responsibility in his son
 - Govind was his only son and sole heir
 - To provide Govind with sufficient funds to pursue his interest of discovering a magic potion
 - He wanted Govind to continue to look after the tenants
 - None of these
72. Which of the following can be said about the sage?
- He was cunning and plotted with Govind's wife to cheat him.
 - He had no magical powers as such and used to swindle people
 - He was a good judge of people
 - He did not deserve his good reputation
 - He was dishonest because he had cheated Govind out of his gold
73. Why was Govind's wife worried ?
- Govind had no knowledge of farming and could not cultivate the land he had inherited from his father
 - Govind had not friends because he was obsessed with finding a potion which would turn anything into gold
 - Govind was only interested in studying under different sages and neglected his family duties
 - Since Govind had devoted all his time and wealth to finding a magic potion, they would soon be poor
 - Govind's experiments to find a magic potion were dangerous
74. Why did Govind's wife help him in the fields?
- To support her husband in his endeavour to find a magic potion.
 - The sage had advised her to help her husband succeed.
 - He needed someone to help him collect the dew.
- Only (B)
 - Only (A)
 - Both (A) and (B)
 - All (A), (B) and (C)
 - None of these
75. Why did Govind decide to cultivate a banana crop?
- The soil of his land was suitable only for cultivating bananas
 - It was the most highly priced commodity in the region
 - It could be grown at any time of the year including winter
 - His wife pressurised him to do so
 - The ingredient for the magic potion could only be obtained from a banana tree

DIRECTIONS (Qs. 76-80) : Read each sentence to find out whether there is any grammatical error or idiomatic error in it.

The error, if any, will be in one part of the sentence. The number of that part is the answer. If there is no error, the answer is (e). (Ignore errors of punctuation, if any.)

76. His proposal had (a) / to be send to (b) / the President of the company (c) / for her approval (d). No error (e).
77. Each tuesday evening we visited (a) / the farmers in the area (b) / and held a meeting (c) / to discuss the problems they faced (c). No error (e).
78. Though our training facilities (a) / are limited only a (b) / few employees have been (c) / selected for training (d). No error (e).
79. During the interview (a) / the panel asked me (b) / several technical questions (c) / and I answered all of it (d). No error (e).
80. He decided to work for (a) / an NGO, but most of his (b) / classmates opted for high paid (c) / jobs in multinational companies (d). No error (e).

DIRECTIONS (Qs. 81-88) : In the following passage there are blanks each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate words in each case.

When we **81** started thirty years ago in 1977, we did not know anything about how to run a bank for the poor. We therefore looked at how others ran their operations and **82** from their mistakes. In Bangladesh, conventional banks and credit co-operatives always **83** lump sum repayments. This created **84** problems because repaying in a lump sum was a mental hurdle for borrowers. They tended to delay repayment and get further into debt in the **85**. In the end they usually **86** totally on the loan, which was a loss to the bank. In structuring our own loans, I decided to ask for a daily payment, Monitoring repayment was **87** and it filled people with **88** that they could repay their loans.

81. (a) firstly (b) freshly
(c) foremost (d) initially
(e) recently
82. (a) copied (b) observed
(c) learned (d) understood
(e) improving
83. (a) asked (b) insisted
(c) demanded (d) settled
(e) lend
84. (a) severe (b) no
(c) additionally (d) variety
(e) plenty
85. (a) time (b) process
(c) return (d) event
(e) action
86. (a) neglected (b) abandoned
(c) defaulted (d) depended
(e) disappointed
87. (a) benefit (b) easier
(c) reckless (d) disorganised
(e) secure

88. (a) sense (b) confidence
(c) challenge (d) doubt
(e) believe

DIRECTIONS (Qs. 89-93): Read this sentence to find out whether there is any grammatical mistake/error in it. The error, if any, will be in one part of the sentence. Mark that part with the error as your answer. If the sentence is correct as it is, mark 'No error' as your answer. (Ignore the errors of punctuation if any.)

89. A red and sore tongue/is an indicator from/lack of iron Vitamin-B₁₂/in the body.
(a) a red and sore tongue
(b) is an indicator from
(c) lack of iron and Vitamin-B₁₂
(d) in the body
(e) No error
90. In the high-strung life/of over- crowded metros/there a constantly tug of war/over space and resources.
(a) in the high-strung life
(b) of over-crowded metros
(c) there a constantly tug of war
(d) over space and resources
(e) No error
91. The foremost criterion of selection we adopted/were the number of years of training/a singer had received/under a particular guru.
(a) The foremost criterion of selection we adopted
(b) were the number of years of training
(c) a singer had received
(d) under a particular guru
(e) No error
92. Excess weight is the result of/unhealthy eating habits/which are inherent risk factors/responsible for many diseases.
(a) excess weight is the result of
(b) unhealthy eating habits
(c) which are inherent risk factors
(d) responsible for many diseases
(e) No error
93. The therapeutic benefits/at helping others/have long been/ recognised by people.
(a) the therapeutic benefits (b) at helping others
(c) have long been (d) recognised by people
(e) No error

DIRECTIONS (Qs. 94-98): Rearrange the given five sentences (A, B, C, D) and (E) in a proper sequence so as to form a meaningful paragraph and then answer the given questions.

- A. With so many products and opportunities available in the market, it is very easy to get this planning wrong.

- B. Planning, therefore, is imperative and should begin as early as possible.
C. What amount will we need and when will we need it?
D. Most of us would put our children's education above any other priority in life including our own retirement.
E. So, let's try to find the best solution by asking two important question.
94. Which of the following should be the **SECOND** sentence after rearrangement?
(a) D (b) B
(c) C (d) E
(e) A
95. Which of the following should be the **FIFTH** sentence after rearrangement?
(a) A (b) B
(c) C (d) E
(e) D
96. Which of the following should be the **FIRST** sentence after rearrangement?
(a) A (b) B
(c) E (d) C
(e) D
97. Which of the following should be the **THIRD** sentence after rearrangement?
(a) D (b) B
(c) C (d) E
(e) A
98. Which of the following should be the **FOURTH** sentence after rearrangement?
(a) A (b) B
(c) E (d) D
(e) C

DIRECTIONS (Qs. 99 & 100): Which phrase should replace the phrase given in bold in the sentence to make it grammatically correct? If the sentence is correct as it is given, then mark 'No correction required' as your answer.

99. In some cases, factors like low salary, lack of growth prospects and lack of motivation **compel all employee** to look for a change.
(a) compel those employees
(b) compelling all employees
(c) compelling the employee
(d) compel employees
(e) No correction required
100. The **easiest way for** prevent stress caused by work or home pressures is to indulge in high levels of physical activity.
(a) easily way to (b) easier ways for
(c) easiest way to (d) easier way from
(e) No correction required

RESPONSE SHEET

- | | | | | | | | | | |
|-----|-----------------|-----|-----------------|-----|-----------------|-----|-----------------|------|-----------------|
| 1. | (a)(b)(c)(d)(e) | 2. | (a)(b)(c)(d)(e) | 3. | (a)(b)(c)(d)(e) | 4. | (a)(b)(c)(d)(e) | 5. | (a)(b)(c)(d)(e) |
| 6. | (a)(b)(c)(d)(e) | 7. | (a)(b)(c)(d)(e) | 8. | (a)(b)(c)(d)(e) | 9. | (a)(b)(c)(d)(e) | 10. | (a)(b)(c)(d)(e) |
| 11. | (a)(b)(c)(d)(e) | 12. | (a)(b)(c)(d)(e) | 13. | (a)(b)(c)(d)(e) | 14. | (a)(b)(c)(d)(e) | 15. | (a)(b)(c)(d)(e) |
| 16. | (a)(b)(c)(d)(e) | 17. | (a)(b)(c)(d)(e) | 18. | (a)(b)(c)(d)(e) | 19. | (a)(b)(c)(d)(e) | 20. | (a)(b)(c)(d)(e) |
| 21. | (a)(b)(c)(d)(e) | 22. | (a)(b)(c)(d)(e) | 23. | (a)(b)(c)(d)(e) | 24. | (a)(b)(c)(d)(e) | 25. | (a)(b)(c)(d)(e) |
| 26. | (a)(b)(c)(d)(e) | 27. | (a)(b)(c)(d)(e) | 28. | (a)(b)(c)(d)(e) | 29. | (a)(b)(c)(d)(e) | 30. | (a)(b)(c)(d)(e) |
| 31. | (a)(b)(c)(d)(e) | 32. | (a)(b)(c)(d)(e) | 33. | (a)(b)(c)(d)(e) | 34. | (a)(b)(c)(d)(e) | 35. | (a)(b)(c)(d)(e) |
| 36. | (a)(b)(c)(d)(e) | 37. | (a)(b)(c)(d)(e) | 38. | (a)(b)(c)(d)(e) | 39. | (a)(b)(c)(d)(e) | 40. | (a)(b)(c)(d)(e) |
| 41. | (a)(b)(c)(d)(e) | 42. | (a)(b)(c)(d)(e) | 43. | (a)(b)(c)(d)(e) | 44. | (a)(b)(c)(d)(e) | 45. | (a)(b)(c)(d)(e) |
| 46. | (a)(b)(c)(d)(e) | 47. | (a)(b)(c)(d)(e) | 48. | (a)(b)(c)(d)(e) | 49. | (a)(b)(c)(d)(e) | 50. | (a)(b)(c)(d)(e) |
| 51. | (a)(b)(c)(d)(e) | 52. | (a)(b)(c)(d)(e) | 53. | (a)(b)(c)(d)(e) | 54. | (a)(b)(c)(d)(e) | 55. | (a)(b)(c)(d)(e) |
| 56. | (a)(b)(c)(d)(e) | 57. | (a)(b)(c)(d)(e) | 58. | (a)(b)(c)(d)(e) | 59. | (a)(b)(c)(d)(e) | 60. | (a)(b)(c)(d)(e) |
| 61. | (a)(b)(c)(d)(e) | 62. | (a)(b)(c)(d)(e) | 63. | (a)(b)(c)(d)(e) | 64. | (a)(b)(c)(d)(e) | 65. | (a)(b)(c)(d)(e) |
| 66. | (a)(b)(c)(d)(e) | 67. | (a)(b)(c)(d)(e) | 68. | (a)(b)(c)(d)(e) | 69. | (a)(b)(c)(d)(e) | 70. | (a)(b)(c)(d)(e) |
| 71. | (a)(b)(c)(d)(e) | 72. | (a)(b)(c)(d)(e) | 73. | (a)(b)(c)(d)(e) | 74. | (a)(b)(c)(d)(e) | 75. | (a)(b)(c)(d)(e) |
| 76. | (a)(b)(c)(d)(e) | 77. | (a)(b)(c)(d)(e) | 78. | (a)(b)(c)(d)(e) | 79. | (a)(b)(c)(d)(e) | 80. | (a)(b)(c)(d)(e) |
| 81. | (a)(b)(c)(d)(e) | 82. | (a)(b)(c)(d)(e) | 83. | (a)(b)(c)(d)(e) | 84. | (a)(b)(c)(d)(e) | 85. | (a)(b)(c)(d)(e) |
| 86. | (a)(b)(c)(d)(e) | 87. | (a)(b)(c)(d)(e) | 88. | (a)(b)(c)(d)(e) | 89. | (a)(b)(c)(d)(e) | 90. | (a)(b)(c)(d)(e) |
| 91. | (a)(b)(c)(d)(e) | 92. | (a)(b)(c)(d)(e) | 93. | (a)(b)(c)(d)(e) | 94. | (a)(b)(c)(d)(e) | 95. | (a)(b)(c)(d)(e) |
| 96. | (a)(b)(c)(d)(e) | 97. | (a)(b)(c)(d)(e) | 98. | (a)(b)(c)(d)(e) | 99. | (a)(b)(c)(d)(e) | 100. | (a)(b)(c)(d)(e) |

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Answer Key

1	(b)	11	(a)	21	(b)	31	(a)	41	(c)	51	(c)	61	(a)	71	(b)	81	(d)	91	(b)
2	(c)	12	(a)	22	(c)	32	(c)	42	(a)	52	(a)	62	(b)	72	(c)	82	(c)	92	(e)
3	(e)	13	(a)	23	(a)	33	(e)	43	(b)	53	(b)	63	(d)	73	(d)	83	(a)	93	(b)
4	(d)	14	(d)	24	(a)	34	(b)	44	(a)	54	(a)	64	(c)	74	(e)	84	(a)	94	(b)
5	(a)	15	(a)	25	(d)	35	(d)	45	(d)	55	(a)	65	(a)	75	(e)	85	(b)	95	(d)
6	(b)	16	(d)	26	(c)	36	(c)	46	(b)	56	(c)	66	(a)	76	(b)	86	(c)	96	(e)
7	(d)	17	(a)	27	(b)	37	(b)	47	(e)	57	(a)	67	(e)	77	(e)	87	(b)	97	(e)
8	(e)	18	(e)	28	(a)	38	(a)	48	(a)	58	(c)	68	(a)	78	(a)	88	(b)	98	(c)
9	(d)	19	(b)	29	(e)	39	(d)	49	(e)	59	(b)	69	(c)	79	(d)	89	(b)	99	(d)
10	(d)	20	(d)	30	(d)	40	(d)	50	(c)	60	(e)	70	(d)	80	(c)	90	(c)	100	(c)

Answers & Explanations

1. (b) $36 \quad 20 \quad \boxed{12} \quad 8 \quad 6 \quad 5$
 $\begin{array}{cccccc} \hline & \underbrace{\hspace{1.5cm}}_{+2+2} & \underbrace{\hspace{1.5cm}}_{+2+2} & \underbrace{\hspace{1.5cm}}_{+2+2} & \underbrace{\hspace{1.5cm}}_{+2+2} & \underbrace{\hspace{1.5cm}}_{+2+2} \\ \hline \end{array}$

2. (c) $668 \quad 656 \quad 632 \quad 584 \quad \boxed{488} \quad 296$
 $\begin{array}{cccccc} \hline & \underbrace{\hspace{1.5cm}}_{-12} & \underbrace{\hspace{1.5cm}}_{-24} & \underbrace{\hspace{1.5cm}}_{-48} & \underbrace{\hspace{1.5cm}}_{-96} & \underbrace{\hspace{1.5cm}}_{-192} \\ \hline & \times 2 & \times 2 & \times 2 & \times 2 & \times 2 \\ \hline \end{array}$

3. (e) $1 \quad 121 \quad 441 \quad 961 \quad 1681 \quad \boxed{2601}$
 $\begin{array}{cccccc} \hline & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ \hline & 1^2 & 11^2 & 21^2 & 31^2 & 41^2 \\ \hline & & & & & \uparrow \\ \hline & & & & & 51^2 \\ \hline \end{array}$

4. (d) $9 \quad 49 \quad 201 \quad 1009 \quad \boxed{4041} \quad 20209 \quad 80841$
 $\begin{array}{cccccc} \hline & \underbrace{\hspace{1.5cm}}_{\times 5+4} & \underbrace{\hspace{1.5cm}}_{\times 4+5} & \underbrace{\hspace{1.5cm}}_{\times 5+4} & \underbrace{\hspace{1.5cm}}_{\times 4+5} & \underbrace{\hspace{1.5cm}}_{\times 5+4} \\ \hline & & & & & \underbrace{\hspace{1.5cm}}_{\times 4+5} \\ \hline \end{array}$

5. (a) $31 \quad 35 \quad 44 \quad 60 \quad 85 \quad \boxed{121}$
 $\begin{array}{cccccc} \hline & \underbrace{\hspace{1.5cm}}_{+2^2} & \underbrace{\hspace{1.5cm}}_{+3^2} & \underbrace{\hspace{1.5cm}}_{+4^2} & \underbrace{\hspace{1.5cm}}_{+5^2} & \underbrace{\hspace{1.5cm}}_{+6^2} \\ \hline \end{array}$

6. (b) Third number
 $= 5 \times 308 - 2 \times 482.5 - 2 \times 258.5$
 $= 1540 - 965 - 517 = 58$

7. (d) Let Sophia's monthly salary = ₹. x .
 ATQ,
 Sophia's % monthly expenditure
 $= (25 + 15 + 35)\% = 75\%$
 Saving % = $100 - 75 = 25\%$
 $\therefore 25\% \text{ of } x = 9050$
 $\Rightarrow x = 9050 \times 4 = ₹ 36200$
 \therefore Sophia's annual income
 $= ₹ (12 \times 36200) = ₹ 434400$

8. (e) Let the number of employees in the companies A, B and C be $3x$, $2x$ and $4x$ respectively.
 Required ratio
 $= \frac{3x \times 120}{100} : \frac{2x \times 130}{100} : \frac{4x \times 115}{100}$
 $= 18 : 13 : 23$

9. (d) Let the present ages of Vaibhav and Jagat be $12x$ and $7x$ years respectively.

According to the question,

$$\frac{12x + 6}{7x + 6} = \frac{3}{2}$$

$$\Rightarrow 24x + 12 = 21x + 18$$

$$\Rightarrow 24x - 21x$$

$$= 18 - 12$$

$$\Rightarrow 3x = 6$$

$$\Rightarrow x = \frac{6}{3} = 2$$

$$\therefore \text{Required difference} = 12x - 7x = 5x = 5 \times 2 = 10 \text{ years}$$

10. (d) $\sqrt{8008} \approx 89.5$

$$89^2 = 7921; 90^2 = 8100$$

$$\therefore \text{Required number}$$

$$= 8100 - 8008 = 92$$

11. (a) $81 \times 83 = 6723$

$$\therefore \text{Smaller number} = 81$$

$$\text{Now, } \sqrt{81} = 9$$

12. (a) Let the first number be x and the second number be y .
 According to the question,

$$x \times \frac{60}{100} = y \times \frac{40}{100}$$

$$\Rightarrow \frac{3x}{5} = \frac{2y}{5}$$

$$\Rightarrow \frac{x}{y} = \frac{2}{3}$$

13. (a) CP of the books

$$= ₹ \left(\frac{100}{128} \times 1408 \right)$$

$$= ₹ 1100$$

14. (d) Let the number be x .
According to the question,
 $(56 - 39)\% \text{ of } x = 425$

$$\Rightarrow \frac{x \times 17}{100} = 425$$

$$\Rightarrow x = \frac{425 \times 100}{17} = \frac{42500}{17}$$

$\therefore 63\% \text{ of } x$

$$= \frac{42500}{17} \times \frac{63}{100} = 1575$$

15. (a) Required average

$$= \frac{456 + 328 + 489 + 453 + 511 + 328 + 222 + 205}{8}$$

$$= \frac{2992}{8} = 374$$

16. (d) $? = \frac{1.69 \times 17.64}{2.7} = 11.04 \approx 11$

17. (a) $? = 23.31 \times 15 = 350$

18. (e) $? = 28.88 \times 18.68 = 539.52 \approx 540$

19. (b) $? = \frac{10299}{754} \approx \frac{10300}{750} \approx 14$

20. (d) $? = 41.25 + 30.48$
 $= 71.5 \approx 72$

21. (b) I. $12x^2 + 11x + 12 = 10x^2 + 22x$
 $2x^2 - 11x + 12 = 0$
 $2x^2 - 8x - 3x + 12 = 0$
 $(x - 4)(2x - 3) = 0$
 $x = 4, x = 3/2$

II. $13y^2 - 18y + 3 = 9y^2 - 10y$
 $4y^2 - 8y + 3 = 0$
 $4y^2 - 6y - 2y + 3 = 0$
 $(2y - 3)(2y - 1) = 0$

$$y = \frac{3}{2}, \frac{1}{2}$$

$$\therefore x > y$$

22. (c) $\frac{18}{x^2} + \frac{6}{x} - \frac{12}{x^2} = \frac{8}{x^2}$
 $\Rightarrow \frac{18 + 6x - 12}{x^2} = \frac{8}{x^2} \Rightarrow 6x + 6 = 8$

$$\therefore x = \frac{2}{6} = 0.33$$

II. $y^3 + 9.68 + 5.64 = 16.95$
 $\Rightarrow y^3 = 16.95 - 15.32$

$$\Rightarrow y^3 = 1.63 = y = \sqrt[3]{1.63}$$

23. (a) I. $35x + 70 = 0$

$$\therefore x = \frac{-70}{35} = -2$$

II. $(81)^{1/4} y + (343)^{1/3} = 0$

$$\Rightarrow 3y + 7 = 0 \Rightarrow 3y = -7$$

$$\therefore y = -\frac{7}{3} = -2.33 \therefore x > y$$

24. (a) I. $\frac{(2)^5 + (11)^3}{6} = x^3$

$$\Rightarrow \frac{32 + 1331}{6} = x^3 \Rightarrow \frac{1363}{6} = x^3$$

$$\therefore x^3 = 227.167$$

II. $4y^3 = \frac{-589}{4} + 5y^3 \Rightarrow \frac{589}{4} = y^3$

$$\therefore y^3 = 147.25 \therefore x > y$$

25. (d) I. $x^{7/5} \div 9 = 169^1 x^{3/5}$

$$\frac{x^{7/5}}{9} = \frac{169}{x^{3/5}}$$

$$\Rightarrow x^{10/5} = 9 \times 169 \Rightarrow x^2 = 9 \times 169$$

$$x = \pm(3 \times 13) = \pm 39$$

II. $y^{1/4} \times y^{1/4} \times 7 = \frac{273}{y^{1/2}}$

$$y = \frac{273}{7} = 39$$

$$x \leq y$$

26. (c) $\Rightarrow (84 + 67)(84 - 67) + \sqrt{7} = 2588$

$$\Rightarrow 151 \times 17 + \sqrt{7} = 2588$$

$$\Rightarrow \sqrt{7} = 2588 - 2567 = 21$$

$$\therefore ? = 21 \times 21 = 441$$

27. (b) $? = 4 \times 284 = 1136$

28. (a) $? = \sqrt[3]{10648} \times \sqrt[3]{5832} = 22 \times 18 = 396$

29. (e) $\frac{60}{100} \times \frac{25}{100} \times \frac{5}{6} \times ? = 630$

$$\therefore ? = 8 \times 630 = 5040$$

30. (d) $? = 147000 \div 1600 = 91.875$

31. (a) C.I. = $P \left[\left(1 + \frac{r}{100} \right)^t - 1 \right]$

$$= 8840 \left[\left(1 + \frac{5}{100} \right)^3 - 1 \right] = 8840 \left[\left(\frac{21}{20} \right)^3 - 1 \right]$$

$$= 8840 \left[\frac{9261}{8000} - 1 \right] = \frac{8840 \times 1261}{8000} = ₹ 1393.405$$

32. (c) SP of 150 metres of clothes = ₹ 6600

$$\therefore \text{SP of 1 m cloth} = ₹ \left[\frac{6600}{150} \right] = ₹ 44$$

$$\text{SP of 300 metres of cloth} = ₹ 12750$$

$$\therefore \text{SP of 1 m cloth} = ₹ \left[\frac{12750}{300} \right] = ₹ 42.5$$

$$\therefore \text{Concession} = ₹ (44 - 42.5) = ₹ 1.5$$

33. (e) Let the number = x .
ATQ,

$$\frac{3888}{x^2} \times 21 = 252$$

$$\Rightarrow x^2 = \frac{3888}{252} \times 21 = 324$$

$$\therefore x = \sqrt{324} = 18$$

34. (b) Let two digit number = $10x + y$
ATQ,

$$x + y = 14 \quad \dots (i)$$

$$x - y = 4 \quad \dots (ii)$$

From equation (i) & (ii), we get
 $y = 5$

$$\text{Now, } x + y = 14$$

$$\therefore x = 14 - 5 = 9$$

Thus, required two-digit number
 $= 10x + y = 10 \times 9 + 5$
 $= 90 + 5 = 95$

35. (d) After servicing, the distance covered in 5 hours
 $= 65 \times 5 = 325$ km.
Without servicing, speed = 40 km/h

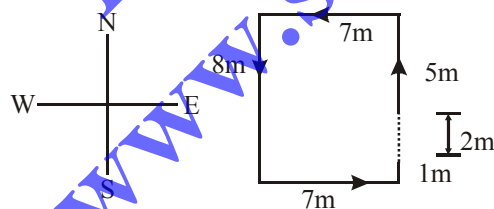
$$\therefore \text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{325}{40} = 8 \text{ hours}$$

36. (c) As talk is related to speak and honest to truthful
similarly listen is to hear.

37. (b) All except the insect fly in the sky.

38. (a) Arranging the words in alphabetical order, we have
Random, Restaurant, Restrict, Robber, Rocket.
So the word in the middle is Restrict and the correct
answer is (a).

39. (d) Clearly, the given letters, when arranged in the order 5,
1, 2, 3, 4 from the word 'TRACE'



40. (d) Code for sit down = 4.
In the given sequence; 4 is repeated six times. Hence,
the student has to sit down six times.

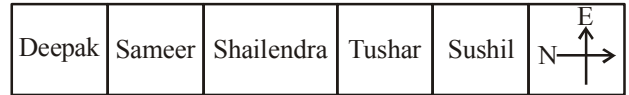
42. (a) Going through information provided, we get codes for
 $G \rightarrow 3, R \rightarrow 8, E \rightarrow 1, C \rightarrow 9$.
Therefore, Greece will be coded as 381191.

43. (b) A person sits on a chair. Since 'chair' is called 'cot',
our answer is 'cot'.

44. (a) One's brother's son's wife's daughter implies paternal
grand-daughter of one's brother. Now, the mother of
paternal grand-daughter of one's brother implies wife
of one's nephew.

Thus, we can conclude that Arun is the paternal uncle
of the female's husband.

45. (d) The boys are standing as follows from L \rightarrow R



46. (b) **Conclusions** : Some buckets are pots.
(conversion)
Some bags are buckets.
(conversion)
Some purses are bags. (conversion)

No mediate inference follows.

\therefore No given **Conclusions** follows.

47. (e) **Statements** : All glasses are roads.

No road is stick.

Conclusions : No glass is stick. (A + E = E-type)

Statements : Some sticks is pens.

Conclusions : Pens are not glass. (E + I = O* type)

Statements : No road is stick.

Some sticks are pens.

Conclusions : Some pens are not road.
(E + I = O* type)

Hence only IV follows.

48. (a) **Statements** : Some ice is ring.
Conclusions : Some rings are ice. (conversion)
Statements : Some rings are gold.
Conclusions : Some gold are ring. (conversion)

Statements : No ring is paint.
Conclusions : Some gold are not paint.
(I + E = O-type)

Statements : Some ice is ring.

No ring is paint.

Conclusions : Some ice is not paint.
(I + E = O-type)

Statements : No ring is paint.
Conclusions : No paint is ring. (Implication)
Hence none follows.

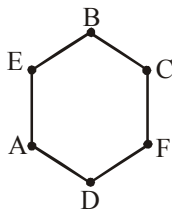
49. (e) **Statements** : Some shoes are bells.
Conclusions : Some bells are shoes. (conversion)

Statements : No candle is bell.
 ↗ ↘
 Some bells are shoes.
Conclusions : Some shoes are not candle.
 (E + I = O*)
Statements : All tables are shoes.
Conclusions : Some tables are shoes. (Implication)
 Some shoes are tables. (conversion)
Statements : No candle is bell.
Conclusions : No bell is candle. (conversion)
 Hence none follow.

50. (c) **Statements** : Some cats are rats.
Conclusions : Some rats are cats. (conversion)
Statements : Some rats are ants.
Conclusions : Some ants are rats (conversion)
Statements : Some ants are flies.
Conclusions : Some flies are ants. (conversion)
 No mediate inference follows.
 Hence, only I and II follow.

For Qs. (51-55)

The following hexagonal arrangement is possible.



51. (c) The other neighbour of A is E.
 52. (a) F is placed opposite to E.
 53. (b) Clearly, C is the required person.
 54. (a) B and F are not neighbours.
For (56-61): Simply follow the rules of the codes and do these sums.
 56. (c) X\$D TFX (Because 1st and last digits are odd.)
 57. (a) \$%HFD# (No any condition.)
 58. (c) HK\$T%H (Because 1st and the last digits are even.)
 59. (b) D%\$HK# (Because 1st digit is odd and the last digit is even.)
 60. (e) HTMK#H (Because 1st and the last digits are even.)
 61. (a) XFH% D X (Because 1st and last digits are odd)

62. (b) $M < N$ (i), $T > U$ (ii); $N < U$ (iii)
 Combining these, we get $M < N < U < T$
 Hence $M < T$ and $T > N$.
 63. (d) $P > T$ (i); $G \leq N$ (ii), $T \geq N$ (iii)
 From (i) and (iii), $P > N$
 From (ii) and (iii), $G \leq T$.
 64. (c) $P \leq Q$ (i); $R > S$ (ii); $Q \geq S$ (iii)
 Thus the relationships can't be established.
 65. (a) $D \geq F$(i); $G > H$ (ii); $F \leq H$ (iii)
 From (ii) and (iii), $G > F$. Hence I follows.
 But II can't be established.
 66. (a) P 1 % T R A 5 # D M 7 K ★ E G 2 8 \$ H 3 1 4 V U 6 F # 9 Z
 In the above series there is no consonant symbol-consonant sequence.
 67. (e) Except it in each choice second and third elements are second to the left of first elements and third to the right of first element respectively.
 68. (a) We have to look for digit-vowel-consonant sequence in the following series.
 P 1 % T R A 5 # D M 7 K ★ E G 2 8 \$ H 3 1 4 V U 6 F # 9 Z
 There is no such sequence.
 70. (d) After changing the series becomes as follows:
 P 1 % T R A 5 # D M 7 K ★ E G 2 8 Z 9 # F 6 U V 4 1 3 H \$
 Now, eighth element to the right of eleventh from the left, i.e., 9.
 71. (b) Refer to the 1st sentence of para 1 'Govind's father left large tract of land to Govind'.
 72. (c) Refer to the 3rd sentence of para 2 "To his surprise.....into gold".
 73. (d) Refer to the last two sentences of para 1 of the passage.
 75. (e) Refer to the sixth sentence of para 2 of the passage 'You have.....during winter'.
 76. (b) 'Sent' is the third form of verb 'send' in passive voice.
 78. (a) Replace 'though' by 'As' to express cause and effect in the sentence.
 79. (d) It should be 'and I answered all of them' to properly express cause and effect in the sentence.
 80. (c) Apply the adverb 'highly' before the adjective 'paid'.

5

PRACTICE SET

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $\frac{1}{4}$ th of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

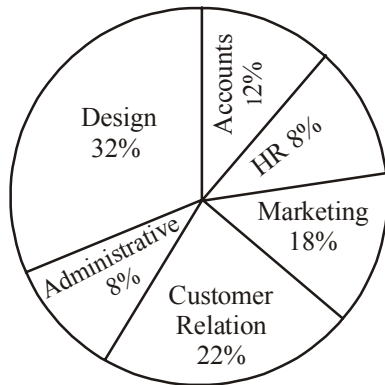
QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-10) : What will come in place of question mark (?) in the following questions ?

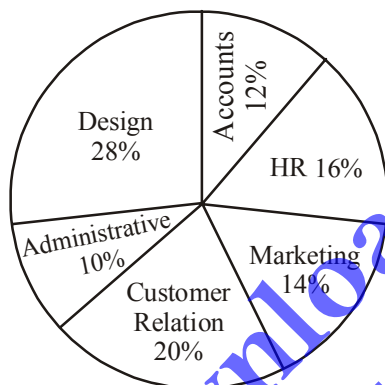
- $48\% \text{ of } 525 + ?\% \text{ of } 350 = 399$
 (a) 42 (b) 46
 (c) 28 (d) 26
 (e) None of these
- $2\frac{5}{9} \times 3\frac{4}{5} + ? = 12\frac{1}{5}$
 (a) $2\frac{13}{45}$ (b) $2\frac{4}{5}$
 (c) $3\frac{22}{45}$ (d) $3\frac{5}{9}$
 (e) None of these
- $\sqrt{7} + 17^2 = 335$
 (a) 46 (b) 42
 (c) 1764 (d) 2116
 (e) None of these
- $\frac{28 \times 5 - 15 \times 6}{7^2 + \sqrt{256} + (13)^2} = ?$
 (a) $\frac{27}{115}$ (b) $\frac{22}{117}$
 (c) $\frac{25}{117}$ (d) $\frac{22}{115}$
 (e) None of these
- $13\frac{4}{7} + 5\frac{2}{7} \times 2\frac{1}{2} = ?$
 (a) $25\frac{11}{14}$ (b) $25\frac{3}{7}$
 (c) $26\frac{3}{7}$ (d) $26\frac{5}{14}$
 (e) None of these
- $784 \div 16 \div 7 = ?$
 (a) 49 (b) 14
 (c) 21 (d) 7
 (e) None of these
- $\frac{3}{2} \text{ of } 455 + \frac{5}{8} \text{ of } 456 = ?$
 (a) 448 (b) 476
 (c) 480 (d) 464
 (e) None of these
- $6425 \div 125 \times 8 = ?$
 (a) 411.2 (b) 41.12
 (c) 64.25 (d) 421.25
 (e) None of these
- $1.05\% \text{ of } 2500 + 2.5\% \text{ of } 440 = ?$
 (a) 37.50 (b) 37.25
 (c) 370.25 (d) 372.50
 (e) None of these
- $4900 \div 28 \times 444 \div 12 = ?$
 (a) 6575 (b) 6475
 (c) 6455 (d) 6745
 (e) None of these

DIRECTIONS (11-15): Study the following graph carefully and answer the questions that follow:

Percentage of employees in different departments of a company Total No. of employees = 4500



Percentage of females in each department in the same company Total No. of females in the organisation = 2000



11. What is the total number of males from Design, Customer Relation and HR departments together ?
 (a) 1550 (b) 1510
 (c) 1540 (d) 1580
 (e) None of these
12. What is the ratio of number of males in HR department to the number of males in Accounts department respectively ?
 (a) 3:17 (b) 4:15
 (c) 2:15 (d) 2:13
 (e) None of these
13. The number of females in the Marketing department are **approximately** what per cent of the total employees in Marketing and Customer Relation Departments together?
 (a) 26 (b) 36
 (c) 6 (d) 46
 (e) 16
14. What is the respective ratio of number of employees in Administrative department to the number of males in the same department ?
 (a) 9:4 (b) 8:3
 (c) 7:2 (d) 8:5
 (e) None of these
15. The total number of females are what per cent of the total number of males in the organisation ?
 (a) 90 (b) 70
 (c) 80 (d) 60
 (e) None of these
- DIRECTIONS (Qs. 16-20) : What will come in place of the question mark (?) in the following number series?**
16. 7 9 12 16 ?
 (a) 22 (b) 19
 (c) 20 (d) 21
 (e) None of these
17. 384 192 96 48 ?
 (a) 36 (b) 28
 (c) 24 (d) 32
 (e) None of these
18. 5 6 14 45 ?
 (a) 183 (b) 185
 (c) 138 (d) 139
 (e) None of these
19. 8 9 13 22 ?
 (a) 30 (b) 31
 (c) 34 (d) 36
 (e) None of these
20. 6 11 21 41 ?
 (a) 81 (b) 61
 (c) 71 (d) 91
 (e) None of these
21. Number of students studying in colleges A and B are in the ratio of 3 : 4 respectively. If 50 more students join college A and there is no change in the number of students in college B, the respective ratio becomes 5 : 6. What is the number of students in college B ?
 (a) 450 (b) 500
 (c) 400 (d) 600
 (e) None of these
22. Cost of 12 belts and 30 wallets is ₹ 8940. What is the cost of 4 belts and 10 wallets?
 (a) ₹ 2890 (b) ₹ 2980
 (c) ₹ 2780 (d) ₹ 2870
 (e) None of these
23. 80% of a number is equal to three-fifth of another number. What is the ratio between the first and the second number respectively?
 (a) 3:4 (b) 4:3
 (c) 4:5 (d) 5:4
 (e) None of these
24. Ghanshyam purchased an article for ₹1850. At what price should he sell it so that 30% profit is earned?
 (a) ₹2450 (b) ₹2245
 (c) ₹2405 (d) ₹2425
 (e) None of the above

25. What is the compound interest accrued on an amount of ₹ 8500 in two years @ interest 10% per annum?
- (a) ₹ 1875 (b) ₹ 1885
(c) ₹ 1775 (d) ₹ 1765
(e) None of these
26. A train running at the speed of 60 kmph crosses a 200 m long platform in 27 s. What is the length of the train ?
- (a) 250m (b) 200m
(c) 240m (d) 450m
(e) None of these
27. Which of the following has the fractions in ascending order?
- (a) $\frac{5}{11}, \frac{3}{8}, \frac{4}{9}, \frac{2}{7}$ (b) $\frac{5}{11}, \frac{4}{9}, \frac{3}{8}, \frac{2}{7}$
(c) $\frac{2}{7}, \frac{3}{8}, \frac{4}{9}, \frac{5}{11}$ (d) $\frac{2}{7}, \frac{4}{9}, \frac{3}{8}, \frac{5}{11}$
(e) None of these
28. Sum of the digits of a two digit number is 8 and the digit in the ten's place is three times the digit in the unit's place. What is the number?
- (a) 26 (b) 36
(c) 71 (d) 62
(e) None of these
29. 10 men can complete a piece of work in 8 days. In how many days can 16 men complete that work?
- (a) 4 days (b) 5 days
(c) 6 days (d) 3 days
(e) None of these
30. 71% of a number is more than its 46% by 120. What is 30% of that number?
- (a) 160 (b) 150
(c) 140 (d) 148
(e) None of these
31. Average of five consecutive odd numbers is 95. What is the fourth number in descending order?
- (a) 91 (b) 95
(c) 99 (d) 97
(e) None of these
32. Latika spends 45% of her monthly income on food and 30% of the monthly income on transport. Remaining amount of ₹4500 she saves. What is her monthly income?
- (a) ₹16000 (b) ₹18000
(c) ₹16500 (d) ₹18500
(e) None of these
33. Amount of simple interest accrued on an amount of Rs 28500 in seven years is Rs 23940 what is the rate of interest % per annum?
- (a) 10.5 (b) 12.5
(c) 11 (d) 12
(e) None of these
34. A and B started a business investing amounts of ₹150000 and ₹250000 respectively. What will be B's share in the profit of ₹160000 ?
- (a) ₹100000 (b) ₹60000
(c) ₹80000 (d) ₹110000
(e) None of these
35. The average age of 60 boys in a class was calculated as 12 years. It was later realised that the actual age of one of the boys in the class was 12.5 years but it was calculated as 14 years. What is the actual average age of the boys in the class?
- (a) 11 years (b) 11.275 years
(c) 11.50 years (d) 11.975 years
(e) None of these

REASONING ABILITY

36. Bihar is related to India in the same as Florida is related to
- (a) Canada (b) Mexico
(c) North America (d) USA
(e) None of these
37. Unscramble the letters in the given words and find the odd one out.
- (a) UMRSME (b) EIWNTR
(c) PIGRSN (d) LCUOD
(e) None of these
38. If the first and second letters in the word DEPRESSION were interchanged, also the third and the fourth letters, the fifth and the sixth letters and so on, which of the following would be the seventh letter from the right ?
- (a) R (b) O
(c) S (d) P
(e) None of these
39. If the positions of the third and tenth letters of the word DOCUMENTATION are interchanged, and likewise the positions of the fourth and seventh letters, the second and sixth letters is interchanged, which of the following will be eleventh from the right end ?
- (a) C (b) I
(c) T (d) U
(e) None of these
40. If the numbers from 1 to 45 which are exactly divisible by 3 are arranged in ascending order, minimum number being on the top, which would come at the ninth place from the top?
- (a) 18 (b) 24
(c) 21 (d) 27
(e) None of these

DIRECTION (Qs. 41 - 45) : In each of the questions below are given two or three statements followed by the conclusions numbered I and II. You have to take the given statements to be true even if they seem to be at variance with commonly known facts and then decide which of the given conclusions logically follows from the given statements. Give answer

- (a) if only conclusion I follows.
(b) if only conclusion II follows.
(c) if neither I nor II follows.
(d) if both I and II follow.
(e) None of these

41. **Statements :** All toys are dolls .
All dolls are jokers.
Some toys are cars.
Conclusions : I. Some cars are jokers.
II. Some dolls are cars.
42. **Statements :** All pens are boxes.
Some boxes are blades.
Some blades are files.
Conclusions : I. Some blades are pens.
II. Some pens are files.
43. **Statements :** All books are ledgers.
All pens are keys.
Some pens are books.
Conclusions : I. Some ledgers are keys.
II. Some keys are books.
44. **Statements :** Some roses are thorns.
All thorns are flowers.
No flower is a petal.
Conclusions : I. No petal is a rose.
II. Some flowers are roses.
45. **Statements :** All leaders are good team workers.
All good team workers are good orators.
Conclusions : I. Some good team workers are leaders.
II. All good orators are leaders.
50. Which of the following groups of teachers has History as the compulsory subject?
(a) A (b) B
(c) E (d) D
(e) None of these
51. Which of the following groups of teachers has History as the compulsory subject?
(a) A, C and D (b) B, C and D
(c) C and D (d) A, B and C
(e) None of these

DIRECTIONS (Qs. 51-55) : Study the following information carefully and answer the questions given below.

In a certain code, the symbol for 0 (zero) is Δ and for 1 is \$. There is no other symbol for all other numbers greater than 1. The numbers greater than 1 are to be written using only the two symbols given above. The value of symbol for 1 doubles itself everytime it shifts one place to the left. Study the following example.

'0' is written as Δ '1' is written as \$
'2' is written as \$ Δ '3' is written as \$\$
'4' is written as \$ $\Delta\Delta$
and so on.

DIRECTIONS (Qs. 46- 50) : Read the following information carefully to answer the questions that follow.

There are six teachers A, B, C, D, E and F in a school. Each of the teachers teaches two subjects, one compulsory subject and the other optional subject. D's optional subject is History while three others have it as compulsory subject. E and F have Physics as one of their subjects. F's compulsory subject is Mathematics which is an optional subject of both C and E. History and English are A's subjects but in terms of compulsory and optional subjects, they are reverse of those of D's. Chemistry is an optional subject of any one of them. There is only one female teacher in the school who has English as her compulsory subject.

46. What is C's compulsory subject?
(a) History (b) Physics
(c) Chemistry (d) English
(e) None of these
47. Who is a female member in the group?
(a) A (b) B
(c) C (d) D
(e) None of these
48. Who among the following has same optional subjects as that of the compulsory subject of F?
(a) D (b) B
(c) A (d) C
(e) None of these
49. Disregarding which is compulsory and which is the optional subject, who has the same two subjects combination as F?
51. Which of the following will represent $7 \times (1 + 4 \div 2)$?
(a) \$ $\Delta\Delta\Delta$ (b) \$\$ $\Delta\Delta$
(c) \$ $\Delta\Delta\Delta$ (d) \$ $\Delta\Delta\Delta$
(e) None of these
52. Which of the following symbol arrangement will represent '9' ?
(a) $\Delta\Delta\Delta\Delta$ (b) \$ $\Delta\Delta\Delta$
(c) \$ $\Delta\Delta\Delta$ (d) \$\$ $\Delta\Delta$
(e) None of these
53. The symbol arrangement \$ $\Delta\Delta\Delta$ represents which of the following numbers?
(a) 18 (b) 25
(c) 17 (d) 16
(e) None of these
54. The symbol arrangement \$\$\$ $\Delta\Delta$ represents which of the following numbers?
(a) 28 (b) 48
(c) 26 (d) 50
(e) None of these
55. Which of the following represents the number 24?
(a) \$ $\Delta\Delta\Delta\Delta$ (b) \$\$\$ $\Delta\Delta\Delta$
(c) \$\$\$ $\Delta\Delta$ (d) \$ $\Delta\Delta\Delta\Delta$
(e) None of these

DIRECTIONS (Qs. 56- 60) : In these questions symbols #, @, \$, *, % are to be used with different meanings as follows:

'A # B' means 'A is neither smaller than nor equal to B'.

'A @ B' means 'A is smaller than B'.

'A \$ B' means 'A is not greater than B'.

'A * B' means 'A is not smaller than B'.

'A % B' means 'A is neither smaller than nor greater than B'.

In each question, three statements showing relationships have been given, which are followed by two conclusions I & II. Assuming that the given statements are true, find out which conclusion(s) is/are definitely true. Mark answer

- (a) if only conclusion I is true;
- (b) if only conclusion II is true;
- (c) if either conclusion I or II is true;
- (d) if neither I nor II is true and
- (e) if both conclusions I and II are true.

56. **Statements:** T @ J, J * M, M \$ B

Conclusions: I. T # M
II. J \$ B

57. **Statements:** R # F, F @ K, K \$ V

Conclusions : I. R # V
II. V # F

58. **Statements:** E @ A, A % F, F \$ Q

Conclusions : I. E @ Q
II. Q * A

59. **Statements:** L # M, M % D, D * Q

Conclusions: I. M # Q
II. Q @ L

60. **Statements:** W \$ F, F @ H, H # R

Conclusions: I. W # R
II. W \$ R

DIRECTIONS (Qs. 61-65): Answer these questions referring to the letter sequence given below:

NOPQYBZARSHIJKILMTUVGEFWXDC

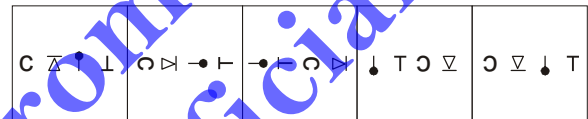
61. If letters of the above given series are written in reverse order then which letter will be third to the left of eighteenth letter from your right?
- (a) Z
 - (b) G
 - (c) I
 - (d) L
 - (e) None of these
62. What will come in place of question mark (?) in the following series ?
NDP, QWB, ZER, ?
- (a) SVJ
 - (b) AFS
 - (c) IVS
 - (d) SFA
 - (e) None of these
63. Which of the following is the fifth to the right of thirteenth letter from you left ?
- (a) T
 - (b) J
 - (c) S
 - (d) Z
 - (e) None of these
64. If every alternate letter starting from O is replaced with odd numbers starting from 1, which letter or number will be third to the left of tenth letter from your right ?

- (a) 15
- (b) L
- (c) K
- (d) I
- (e) None of these

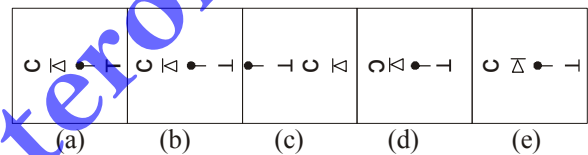
65. If it is possible to make a meaningful word from the eighth, sixteenth, seventeenth and twenty-second letters from your left in the given series, which will be th first letter of that word? If no such word can be formed, your answer would be X, and if more than one such word can be formed, answer is P.
- (a) M
 - (b) T
 - (c) X
 - (d) E
 - (e) P

DIRECTIONS (Qs. 66-70) : In each of the questions given below which one of the five answer figures on the right should come after the problem figures on the left, if the sequence were continued ?

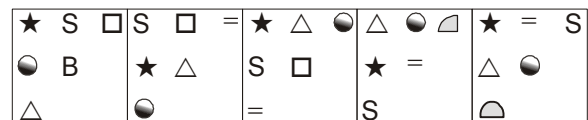
66. **Problem Figures**



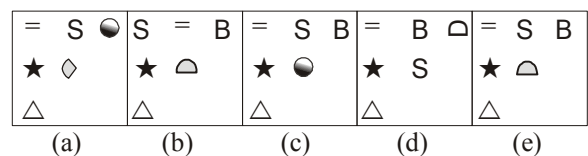
Answer Figures



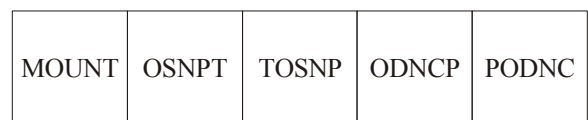
67. **Problem Figures**



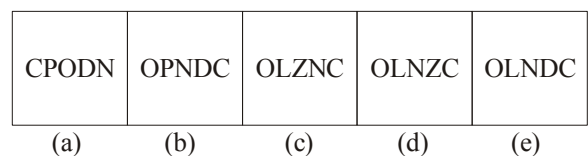
Answer Figures



68. **Problem Figures**



Answer Figures



69. Problem Figures

●	=	=	●	S	=	=	S	V	=
★	V	S	Z	Z	●	V	△	△	S
S	Z	★	V	V	△	Z	●	●	★
△	□	□	△	★	□	□	★	Z	□

Answer Figures

=	V	△	V	=	V	V	=	=	V
●	★	S	=	△	★	●	★	●	★
△	S	★	□	●	S	△	S	△	S
□	Z	●	△	□	Z	□	Z	Z	□
(a)	(b)	(c)	(d)	(e)					

70. Problem Figures

★	□	●	★	D	□	●	D	★	□					
Z	△	D	D	Z	△	C	A	★	★	C	A	△	S	A
●	C	C	□	●	△	△	□	●	D					

Answer Figures

□	D	●	D	●	★	●	★	●	★					
A	△	S	★	B	□	A	△	S	S	A	△	A	△	S
★	●	△	A	D	□	D	□	□	D					
(a)	(b)	(c)	(d)	(e)										

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-80): Read the following passage carefully and answer the questions given below it.

Once upon a time a dishonest king had a man called the Valuer in his court. The Valuer set the price which ought to be paid for horses and elephants and the other animals. He also set the price on jewellery and gold, and things of that kind. This man was honest and just, and set the proper price to be paid to the owners of the goods. The king, however, was not pleased with this Valuer, because he was honest. "If I had another sort of a man as Valuer, I might gain more riches," he thought.

One day the king saw a stupid, miserly peasant come into the palace yard. The king sent for the fellow and asked him if he would like to be the Valuer. The peasant said he would like the position. So the king had him made Valuer. He sent the honest Valuer away from the palace.

Then the peasant began to set the prices on horses and elephants, upon gold and jewels. He did not know their value, so he would say anything he chose. As the king had made him Valuer, the people had to sell their goods for the price he set. By and by a horse-dealer brought five hundred horses to the court of this king. The Valuer came and said they were worth a mere measure of rice. So the king ordered the horse-dealer to be given the measure of rice, and the horses to be put in the palace stables.

The horse-dealer then went to see the honest man who had been the Valuer, and told him what had happened. "What shall I do?" asked the horse-dealer. "I think you can give a present to

the Valuer which will make him do and say what you want him to do and say," said the man. "Go to him and give him a fine present, then say to him: "You said the horses are worth a measure of rice but now tell what a measure of rice is worth! Can you value that standing in your place by the king?" If he says he can, go with him to the king, and I will be there, too."

The horse-dealer thought this was a good idea. So he gave a fine present to the Valuer, and said what the other man had told him to say. The stupid Valuer took the present, and said: "Yes, I can go before the king with you and tell what a measure of rice is worth. I can value that now." Well, let us go at once," said the horse-dealer. So they went before the king and his ministers in the palace.

The horse-dealer bowed down before the king, and said: "O King, I have learned that a measure of rice is the value of my five hundred horses. But will the king be pleased to ask the Valuer what is the value of the measure of rice". The king, not knowing what had happened, asked, "How now, Valuer, what are five hundred horses worth?" "A measure of rice, O King!" said he. "Very good, then! If five hundred horses are worth a measure of rice, what is the measure of rice worth?" "The measure of rice is worth your whole city," replied the foolish fellow.

The ministers clapped their hands, laughing, and saying, "What a foolish Valuer! How can such a man hold that office? We used to think this great city was beyond price, but this man says it is worth only a measure of rice," Then the king was ashamed, and drove out the foolish fellow. "I tried to please the king by setting a low price on the horses, and now see what has happened to me!" said the Valuer, as he ran away from the laughing crowd.

71. Who did the king appoint as the new Valuer?
 - (a) A minister
 - (b) A horse merchant
 - (c) Himself
 - (d) A stingy peasant
 - (e) None of these
72. Why was the king not happy with the old Valuer?
 - (a) As the Valuer was not good at his work
 - (b) As he had dishonoured the king
 - (c) As the Valuer had been dishonest with the king about the prices that he set for goods
 - (d) As the king believed that he was not earning much because of the Valuer's honesty
 - (e) None of these
73. Which of the following words can be used to describe the king?
 - (1) Smart
 - (2) Dishonest
 - (3) Cheat
 - (a) Only (1)
 - (b) Only (2)
 - (c) Only (2) and (3)
 - (d) Only (1) and (3)
 - (e) All the three (1), (2) and (3)
74. What can possibly be the moral of the story?
 - (a) Slow and steady wins the race
 - (b) Change is the only permanent thing in life
 - (c) An honest answer is the sign of true friendship
 - (d) Haste makes waste
 - (e) No legacy is so rich as honesty

75. Why did the Ministers laugh at the new Valuer?
 (a) As he had sold the king's city at a very low price
 (b) As he had displayed his stupidity by quoting an abysmally low price on the king's city
 (c) As he had cheated the horse dealer
 (d) As he had not calculated the price of the five hundred horses correctly
 (e) None of these
76. What did the new Valuer do when he got the present from the horse dealer?
 (a) He accepted the present and resigned from his post as was requested by the horse-dealer
 (b) He accepted the present and agreed to state the worth of a measure of rice in the presence of the King
 (c) He accepted the present and immediately returned the horse-dealer's horses
 (d) He refused to accept the present from the horse-dealer and asked him to leave the premises
 (e) None of these
77. Which of the following can be said about the old Valuer?
 (1) He was honest. (2) He was intelligent.
 (3) He was revengeful.
 (a) Only (1) (b) Only (3)
 (c) Only (1) and (2) (d) Only (1) and (3)
 (e) All the three (1), (2) and (3)
78. What was the worth of a measure of rice according to the new Valuer?
 (a) The king's entire city
 (b) The king's life
 (c) Two horses
 (d) Not mentioned in the passage
 (e) None of these
79. Why did the horse-dealer go to meet the old Valuer?
 (a) As the new Valuer had set a very inappropriate price for his five hundred horses
 (b) As his five hundred horses were stolen from him by the king
 (c) As he was a very good friend of the old Valuer
 (d) As the king had requested him to do so
 (e) None of these
80. What advice did the old Valuer give to the horse-dealer?
 (a) He asked the horse-dealer to inquire with the king about the worth of a measure of rice
 (b) He asked the horse-dealer to bribe the new Valuer and get his horses back
 (c) He asked the horse-dealer to forget about his horses and go on with his life
 (d) He asked the horse-dealer to publicize his plight and thus get his horses back
 (e) None of these
81. As it was already afternoon, Rohan decided to **check out** of the hotel and go home.
 (a) for checking out (b) to checking out
 (c) to check outing (d) to checked out
 (e) No correction required
82. Five people **which ignored an** evacuation order were trapped in a mountain region encircled by a wildfire.
 (a) who ignored an (b) those ignoring an
 (c) who ignores a (d) that ignored a
 (e) No correction required
83. Since she was the most popular model on the ramp, she thought **no end to herself**.
 (a) no ending to herself (b) no ends of herself
 (c) no end of herself (d) no end with herself
 (e) No correction required
84. The actress says that she is not comfortable **walk into** the ramp in designer-wear.
 (a) to walks on (b) walking down
 (c) walking with (d) walks to
 (e) No correction required
85. Not many bank on the power of realism and comedy to make an impression and so, when one does, it **makes head truns**.
 (a) making heads turn
 (b) make head turnings
 (c) making heads turining
 (d) makes heads turn
 (e) No correction required

DIRECTIONS (Qs. 86-90) : In each question below, a sentence with four words printed in bold type is given. These are numbered as (a), (b), (c) and (d). One of these four words printed in bold may be either wrongly spelt or inappropriate in the context of the sentence. Find out the word which is wrongly spelt or inappropriate, if any. The number of that word is your answer. If all the words printed in bold are correctly spelt and also appropriate in the context of the sentence, mark (e) i.e., All correct' as your answer.

86. The city's fashion-conscious **ladies** (a)/ came together at a city hotel to check out an **exhibition** (b)/ by **various** (c)/ **designers** (d)/ and labels. All correct (e)
87. The ministry's **proposal** (a)/ for an **autonomous** (b)/ overarching **authority** (c)/ for higher education and research was finally **approval**. (d)/ All correct (e)
88. **Silense** (a)/ is to **retreat** (b)/ in wordless prayer, **gazing** (c)/ out the window of your heart, and going for slow **meandering** (d)/ walks in a garden. All correct (e)
89. A majority of Army tanks continue to **gripe** (a)/ in the dark, **stricken** (b)/ as they are with an **ecute** (c) case of night **blindness**. (d)/ All correct (e)
90. Back home, the ever **affable** (a)/ Bollywood singer shares the **excitement** (b) of **having** (c)/ **performed** (d)/ at the Royal Hall in London. All correct (e)

DIRECTIONS (Qs. 81-85) : Which of the phrases (a), (b), (c) and (d) given below each sentence should replace the phrase printed in bold in the sentence to make it grammatically correct? If the sentence is correct as it is given and no correction is required, mark (e) as the answer.

DIRECTIONS (Qs. 91-100) : In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

There was once a gardener who (91) care of the king's garden. In the garden, lived a family of monkeys. Seeing the gardener at work, the monkeys soon (92) to imitate him. As the gardener tended the plants and weeded and watered the garden, he was amused to see that the monkeys also did (93) what he did. The gardener was happy that he had so much unpaid help.

One day the gardener wanted to (94) a fair in the city. He had an idea. He called the chief of the monkeys and said to him, "I have to go out for the day. Can you and your family water my plants like you (95) do? I promise you that if you help me I will (96) sweets for you from the fair. The monkeys agreed. But after the gardener had left, they had a (97). How much water were they to pour for each plant? then one of them said. "For plants with big roots, we must pour (98) of water and for the ones with small roots, we pour only a little water." So, the monkeys (99) out each plant and then pushed it back again after looking at the root. As a result, many plants (100) and died. On his return, the gardener realized that he had been very foolish to trust a bunch of mere monkeys to do his job.

91. (a) took (b) was
(c) great (d) handle
(e) mended

92. (a) try (b) told
(c) were (d) bent
(e) learnt
93. (a) main (b) exactly
(c) many (d) because
(e) too
94. (a) call (b) make
(c) stall (d) go
(e) visit
95. (a) forcefully (b) hardly
(c) usually (d) costly
(e) truly
96. (a) ask (b) bring
(c) got (d) throw
(e) create
97. (a) party (b) time
(c) answer (d) doubt
(e) water
98. (a) body (b) many
(c) lots (d) weight
(e) quantity
99. (a) thrashed (b) saw
(c) stuck (d) pulled
(e) splashed
100. (a) withered (b) crushed
(c) killed (d) grew
(e) smiled

RESPONSE SHEET

- | | | | | |
|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|
| 1. (a) (b) (c) (d) (e) | 2. (a) (b) (c) (d) (e) | 3. (a) (b) (c) (d) (e) | 4. (a) (b) (c) (d) (e) | 5. (a) (b) (c) (d) (e) |
| 6. (a) (b) (c) (d) (e) | 7. (a) (b) (c) (d) (e) | 8. (a) (b) (c) (d) (e) | 9. (a) (b) (c) (d) (e) | 10. (a) (b) (c) (d) (e) |
| 11. (a) (b) (c) (d) (e) | 12. (a) (b) (c) (d) (e) | 13. (a) (b) (c) (d) (e) | 14. (a) (b) (c) (d) (e) | 15. (a) (b) (c) (d) (e) |
| 16. (a) (b) (c) (d) (e) | 17. (a) (b) (c) (d) (e) | 18. (a) (b) (c) (d) (e) | 19. (a) (b) (c) (d) (e) | 20. (a) (b) (c) (d) (e) |
| 21. (a) (b) (c) (d) (e) | 22. (a) (b) (c) (d) (e) | 23. (a) (b) (c) (d) (e) | 24. (a) (b) (c) (d) (e) | 25. (a) (b) (c) (d) (e) |
| 26. (a) (b) (c) (d) (e) | 27. (a) (b) (c) (d) (e) | 28. (a) (b) (c) (d) (e) | 29. (a) (b) (c) (d) (e) | 30. (a) (b) (c) (d) (e) |
| 31. (a) (b) (c) (d) (e) | 32. (a) (b) (c) (d) (e) | 33. (a) (b) (c) (d) (e) | 34. (a) (b) (c) (d) (e) | 35. (a) (b) (c) (d) (e) |
| 36. (a) (b) (c) (d) (e) | 37. (a) (b) (c) (d) (e) | 38. (a) (b) (c) (d) (e) | 39. (a) (b) (c) (d) (e) | 40. (a) (b) (c) (d) (e) |
| 41. (a) (b) (c) (d) (e) | 42. (a) (b) (c) (d) (e) | 43. (a) (b) (c) (d) (e) | 44. (a) (b) (c) (d) (e) | 45. (a) (b) (c) (d) (e) |
| 46. (a) (b) (c) (d) (e) | 47. (a) (b) (c) (d) (e) | 48. (a) (b) (c) (d) (e) | 49. (a) (b) (c) (d) (e) | 50. (a) (b) (c) (d) (e) |
| 51. (a) (b) (c) (d) (e) | 52. (a) (b) (c) (d) (e) | 53. (a) (b) (c) (d) (e) | 54. (a) (b) (c) (d) (e) | 55. (a) (b) (c) (d) (e) |
| 56. (a) (b) (c) (d) (e) | 57. (a) (b) (c) (d) (e) | 58. (a) (b) (c) (d) (e) | 59. (a) (b) (c) (d) (e) | 60. (a) (b) (c) (d) (e) |
| 61. (a) (b) (c) (d) (e) | 62. (a) (b) (c) (d) (e) | 63. (a) (b) (c) (d) (e) | 64. (a) (b) (c) (d) (e) | 65. (a) (b) (c) (d) (e) |
| 66. (a) (b) (c) (d) (e) | 67. (a) (b) (c) (d) (e) | 68. (a) (b) (c) (d) (e) | 69. (a) (b) (c) (d) (e) | 70. (a) (b) (c) (d) (e) |
| 71. (a) (b) (c) (d) (e) | 72. (a) (b) (c) (d) (e) | 73. (a) (b) (c) (d) (e) | 74. (a) (b) (c) (d) (e) | 75. (a) (b) (c) (d) (e) |
| 76. (a) (b) (c) (d) (e) | 77. (a) (b) (c) (d) (e) | 78. (a) (b) (c) (d) (e) | 79. (a) (b) (c) (d) (e) | 80. (a) (b) (c) (d) (e) |
| 81. (a) (b) (c) (d) (e) | 82. (a) (b) (c) (d) (e) | 83. (a) (b) (c) (d) (e) | 84. (a) (b) (c) (d) (e) | 85. (a) (b) (c) (d) (e) |
| 86. (a) (b) (c) (d) (e) | 87. (a) (b) (c) (d) (e) | 88. (a) (b) (c) (d) (e) | 89. (a) (b) (c) (d) (e) | 90. (a) (b) (c) (d) (e) |
| 91. (a) (b) (c) (d) (e) | 92. (a) (b) (c) (d) (e) | 93. (a) (b) (c) (d) (e) | 94. (a) (b) (c) (d) (e) | 95. (a) (b) (c) (d) (e) |
| 96. (a) (b) (c) (d) (e) | 97. (a) (b) (c) (d) (e) | 98. (a) (b) (c) (d) (e) | 99. (a) (b) (c) (d) (e) | 100. (a) (b) (c) (d) (e) |

Answer Key

1	(a)	11	(b)	21	(d)	31	(e)	41	(d)	51	(d)	61	(b)	71	(d)	81	(e)	91	(a)
2	(e)	12	(c)	22	(b)	32	(b)	42	(c)	52	(c)	62	(e)	72	(d)	82	(a)	92	(e)
3	(d)	13	(e)	23	(a)	33	(d)	43	(d)	53	(e)	63	(a)	73	(c)	83	(c)	93	(b)
4	(c)	14	(a)	24	(c)	34	(a)	44	(b)	54	(d)	64	(d)	74	(e)	84	(b)	94	(e)
5	(e)	15	(c)	25	(e)	35	(d)	45	(a)	55	(b)	65	(e)	75	(b)	85	(d)	95	(c)
6	(d)	16	(d)	26	(a)	36	(d)	46	(a)	56	(d)	66	(d)	76	(b)	86	(b)	96	(b)
7	(c)	17	(c)	27	(c)	37	(d)	47	(d)	57	(b)	67	(e)	77	(c)	87	(d)	97	(d)
8	(a)	18	(e)	28	(d)	38	(d)	48	(d)	58	(a)	68	(d)	78	(a)	88	(a)	98	(c)
9	(b)	19	(e)	29	(b)	39	(c)	49	(c)	59	(b)	69	(a)	79	(a)	89	(c)	99	(d)
10	(b)	20	(a)	30	(e)	40	(d)	50	(d)	60	(c)	70	(c)	80	(e)	90	(e)	100	(a)

Answers & Explanations

1. (a) $48\% \text{ of } 525 + ?\% \text{ of } 350 = 399$

$$\Rightarrow \frac{48}{100} \times 525 + \frac{?}{100} \times 350 = 399$$

$$\Rightarrow 25200 + ? \times 350 = 399 \times 100$$

$$\Rightarrow ? \times 350 = 39900 - 25200 = 14700$$

$$\Rightarrow ? = \frac{14700}{350} = 42$$

2. (e) $2\frac{5}{9} \times 3\frac{4}{5} + ? = 12\frac{1}{5}$

$$\Rightarrow \frac{23}{9} \times \frac{19}{5} + ? = \frac{61}{5}$$

$$\Rightarrow ? = \frac{61}{5} - \frac{437}{45}$$

$$\Rightarrow ? = \frac{549 - 437}{45}$$

$$\Rightarrow ? = \frac{112}{45} = 2\frac{22}{45}$$

3. (d) $\sqrt{?} + 17^2 = 335$

$$\Rightarrow \sqrt{?} + 289 = 335$$

$$\Rightarrow \sqrt{?} = 335 - 289 = 46$$

$$\Rightarrow ? = 46 \times 46 = 2116$$

4. (c) $? = \frac{28 \times 5 - 15 \times 6}{7^2 + \sqrt{256} + (13)^2}$

$$\Rightarrow ? = \frac{140 - 90}{49 + 16 + 169}$$

$$\Rightarrow ? = \frac{50}{234} = \frac{25}{117}$$

5. (e) $? = 13\frac{4}{7} + 5\frac{2}{7} \times 2\frac{1}{2}$

$$\Rightarrow ? = \frac{95}{7} + \frac{37}{7} \times \frac{5}{2}$$

$$\Rightarrow ? = \frac{95}{7} + \frac{185}{14}$$

$$\Rightarrow ? = \frac{190 + 185}{14}$$

$$\Rightarrow ? = \frac{375}{14} = 26\frac{11}{14}$$

6. (d) $? = 784 \div 16 \div 7$

$$\Rightarrow ? = \frac{784}{16} \div 7 \Rightarrow ? = 49 \div 7 = 7$$

7. (c) $? = \frac{3}{7} \text{ of } 455 + \frac{5}{8} \text{ of } 456$

$$\Rightarrow ? = \frac{3}{7} \times 455 + \frac{5}{8} \times 456$$

$$\Rightarrow ? = 195 + 285$$

$$\Rightarrow ? = 480$$

8. (a) $? = 6425 \div 125 \times 8$

$$\Rightarrow ? = 51.4 \times 8$$

$$\Rightarrow ? = 411.2$$

9. (b) $? = 1.05\% \text{ of } 2500 + 2.5\% \text{ of } 440$

$$\Rightarrow ? = \frac{1.05}{100} \times 2500 + \frac{2.5}{100} \times 440$$

$$\Rightarrow ? = \frac{2625}{100} + \frac{1100}{100}$$

$$\Rightarrow ? = \frac{3725}{100} = 37.25$$

10. (b) $? = 4900 \div 28 \times 444 \div 12$

$$\Rightarrow ? = 175 \times 37$$

$$\Rightarrow ? = 6475$$

11. (b) Number of employees in design, customer relation and HR departments together
 $4500 \times (32 + 22 + 8)\%$

$$= \frac{4500 \times 62}{100} = 2790$$

Number of women employees in these departments
 $= 2000 \times (28 + 20 + 16)\%$

$$= \frac{2000 \times 64}{100} = 1280$$

\therefore Required number of males
 $= 2790 - 1280 = 1510$

12. (c) Number of employees in HR department

$$= \frac{4500 \times 8}{100} = 360$$

\therefore Number of males

$$= 360 - \frac{2000 \times 16}{100}$$

$$= 360 - 320 = 40$$

Number of employees in Accounts department

$$= \frac{4500 \times 12}{100} = 540$$

\therefore Number of males

$$= 540 - \frac{2000 \times 12}{100}$$

$$= 540 - 240 = 300$$

\therefore Required ratio = $40 : 300 = 2 : 15$

13. (e) Number of employees in marketing and customer relation departments

$$= \frac{4500 \times 40}{100} = 1800$$

Number of females in the marketing department

$$= \frac{2000 \times 14}{100} = 280$$

$$\therefore \text{Required percentage} = \frac{280}{1800} \times 100 \approx 16$$

14. (a) Total number of employees in administrative department

$$= \frac{4500 \times 8}{100} = 360$$

Number of males in the same department

$$= 360 - 200 = 160$$

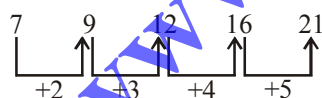
\therefore Required ratio

$$= 360 : 160 = 9 : 4$$

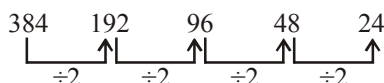
15. (c) Required percentage

$$= \frac{2000}{2500} \times 100 = 80$$

16. (d) Pattern of the series would be as follows



17. (c) Pattern of the series would be as follows



18. (e) Pattern of the series would be as follows

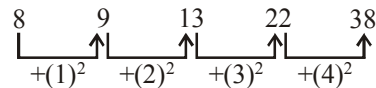
$$5 \times 1 + 1 = 6$$

$$6 \times 2 + 2 = 14$$

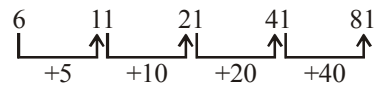
$$14 \times 3 + 3 = 45$$

$$\therefore 45 \times 4 + 4 = 184$$

19. (e) Pattern of the series would be as follows



20. (a) Pattern of the series would be as follows



21. (d) Let total number of students in college $A = 3x$ and total number of students in college $B = 4x$ After 50 more students join college A

$$\text{New Ratio} = \frac{3x + 50}{4x} = \frac{5}{6}$$

$$\Rightarrow 18x + 300 = 20x$$

$$\Rightarrow 2x = 300$$

$$\Rightarrow x = \frac{300}{2} = 150$$

Total number of students in college

$$B = 4x = 4 \times 150 = 600$$

22. (b) \therefore Cost price of (12 belts + 30 wallers) = ₹ 8940

$$\therefore \text{Cost price of } 3 \times (4 \text{ belts} + 10 \text{ wallets}) = ₹ 8940$$

$$\therefore \text{Cost price of } 4 \text{ belts} + 10 \text{ wallets} = \frac{8940}{3} = ₹ 2980$$

23. (a) Let the first number be x and the second number be y

$$\text{Then, } 80\% \text{ of } x = \frac{3}{5} \text{ of } y$$

$$\Rightarrow \frac{80}{100} \times x = \frac{3}{5} \times y$$

$$\Rightarrow \frac{4}{5} \times x = \frac{3}{5} \times y \quad \Rightarrow \quad 4x = 3y$$

$$\Rightarrow \frac{x}{y} = \frac{3}{4} = 3 : 4$$

24. (c) \therefore Cost price of an article = ₹ 1850

For 30% profit, selling price of this article

$$= 1850 \times \frac{130}{100} = ₹ 2405$$

25. (e) Compound Interest after two years

$$= 8500 \left(1 + \frac{10}{100} \right)^2 - 8500$$

$$= 8500 \times \frac{11}{10} \times \frac{11}{10} - 8500$$

$$= 10285 - 8500 = ₹ 1785$$

26. (a) Let length of the train be x m

$$\text{Speed of the train be } 60 \text{ km/h} = 60 \times \frac{5}{18} = \frac{50}{3} \text{ m/s}$$

$$\text{Then, } \frac{x + 200}{\frac{50}{3}} = 27$$

$$\Rightarrow \frac{3(x+200)}{50} = 27$$

$$\Rightarrow 3x + 600 = 1350$$

$$\Rightarrow 3x = 1350 - 600$$

$$\Rightarrow 3x = 750$$

$$\Rightarrow x = \frac{750}{3} = 250 \text{ m}$$

27. (c) Each fractions, decimal value are given below :

$$\frac{5}{11} = 0.454, \frac{3}{8} = 0.375, \frac{4}{9} = 0.444, \frac{2}{7} = 0.286$$

So, ascending order of the fractions is $\frac{2}{7}, \frac{3}{8}, \frac{4}{9}, \frac{5}{11}$.

28. (d) Let ten's digit be x and unit's digit be $8 - x$

Then, $x = 3(8 - x)$

$$\Rightarrow x = 24 - 3x,$$

$$\Rightarrow 4x = 24$$

$$\Rightarrow x = \frac{24}{4} = 6$$

$$\therefore \text{unit's digit} = 8 - x = 8 - 6 = 2$$

So, required number = 62

29. (b) Suppose 16 men can complete the same work in x days

Then, Men days

$$\begin{array}{cc} 10 \uparrow & 8 \downarrow \\ 16 \downarrow & x \uparrow \end{array}$$

$$16 : 10 :: 8 : x$$

$$\Rightarrow 16 \times x = 10 \times 8$$

$$\Rightarrow x = \frac{10 \times 8}{16} = 5 \text{ days}$$

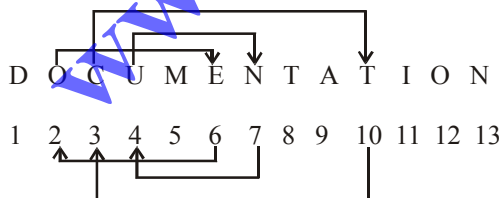
36. (d) Bihar is a state in India. Similarly, Florida is a state in USA.

37. (d) (a) Summer (b) Winter (c) Spring (d) Cloud
All others are name of seasons.

38. (d) The new letter sequence is EDRPSEISNO.
The seventh letter from the right is P.



39. (c)



40. (d) The series will be as follows:

- 3 6 9 12 15 18 21 24 (27) 30 33 36 39 42
45

41. (d) **Statements** : All toys are dolls.

All dolls are jokers

Conclusions : All toys are jokers.
[A + A = A-type conclusion]

Statements : Some toys are cars.

Conclusions : Some cars are toys. (Conversion)

Statements : All toys are jokers.

Conclusions : Some cars are jokers.
(I + A = I-type conclusion)

\therefore I follows.
Some cars are toys

Statements : All toys are dolls.

Conclusions : Some cars are dolls.
Some dolls are cars. (Conversion)
 \therefore II follows.

42. (c) **Conclusions** : Some pens are boxes.

(Implication of first statement)

Some boxes are pens.

(Conversion of first statement)

Some blades are boxes.

(Conversion of second statement)

Some files are blades.

(Conversion of third statement)

No mediate inference follows. Hence, no given **Conclusions** follows.

43. (d) **Statements** : Some pens are books.

Conclusion : Some books are pens. (conversion)

Statements : All pens are keys.
Some books are keys.

(I + A = I-type conclusion)

Some keys are books. (Conversion)

\therefore II follows.

Statements : Some pens are books.

All books are ledgers.

Conclusions : Some pens are ledgers.

(I + A = I-type)

Some ledgers are pens. (conversion)

Statements : All pens are keys.

Conclusions : Some ledgers are keys.

(I + A = I-type)

\therefore I follows.

44. (b) **Statements** : Some roses are thorns.

All thorns are flowers.

Conclusions : Some roses are flowers.
(I + A = I-type)
Some flowers are roses. (conversion)
Hence, II follows.

Statements : No flower is petal.

Conclusions : No petal is flower. (conversion)

↔
Some flowers are roses.

Conclusions : Some roses are not petals.
(E + I = O*-type)
Hence, I does not follow.

45. (a) **Statements** : All leaders are good team workers.

Conclusions : Some good team workers are leaders. (Conversion)
Hence, I follows.

Statements : All good team workers are good orators.

Conclusions : Some good orators are good team workers. (conversion)
Hence, II does not follow.

For (Qs. 46 to 50)

The given information is summarised in a table as follows :

Teachers	Subjects	
	Compulsory	Optional
A	History	English
B	History	Chemistry
C	History	Mathematics
D	(Female) English	History
E	Physics	Mathematics
F	Mathematics	Physics

46. (a) History is the compulsory subject of C.

47. (d) D is a female member in the group.

48. (d) The compulsory subject of F (mathematics) is the optional subject of C.

49. (c) E has physics and mathematics as his two subjects.

50. (d) A, B and C all have history as the compulsory subjects.

For (Qs. 51-55):

These questions are based on the binary system which is made of digits 0 and 1, here represented by Δ and $\$$ respectively.

51. (d) $7 \times (1 + 4 \div 2) = 7 \times (1 + 2) = 7 \times 3 = 21$
Now, $21 = 16 + 0 + 4 + 0 + 1$
 $= 1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$
 $= (10101)_2$

52. (c) $9 = 8 + 0 + 0 + 1$
 $= 1 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 = (10001)_2$

53. (e) $\$ \Delta \Delta \$ \$ = (10011)_2$
 $= 1 \times 2^4 + 0 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$
 $= 16 + 0 + 0 + 2 + 1 = 19$

54. (d) $\$ \$ \Delta \Delta \$ \$ \Delta = (1100010)_2$
 $= 1 \times 2^5 + 1 \times 2^4 + 0 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$
 $= 32 + 16 + 0 + 0 + 2 + 0 = 50$

55. (b) $24 = 16 + 8 + 0 + 0 + 0$
 $= 1 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 0 \times 2^0 = (11000)_2$

56. (d) $T < J, J \geq M, M \leq B$
No relation between T and M, and J and B.
So neither I nor II is true.

57. (b) $R > F, F < K, K \leq V$
No relation between R and V. So conclusion I is not true.

But $V \geq K > F$ or $V > F$
So, conclusion II is true.

58. (a) $E < A, A = F, F \leq Q$
Combining all, $Q \geq F = A > E$ or $E < Q$ and $Q \geq A$
So, only conclusion I is true.

59. (b) $L > M, M = D, D \geq Q$
Combining all, $L > M = D \geq Q$ or $M \geq Q$ and $Q < L$.
So, only conclusion II is true.

60. (c) $W \leq F, F < H, H > R$
Although no direct relation between W and R but I and II together show all three probable relations. Hence either I or II is true.

61. (b) $18 + 3 = 21$ st letter from the right in the reverse series or, 21st letter from the left in the original series.

62. (e) $N + 3 = Q, Q + 3 = Z, Z + 3 = S$
 $D - 2 = W, W - 2 = E, E - 2 = V$
 $P + 3 = B, B + 3 = R, R + 3 = I$ Hence, ? = SVI

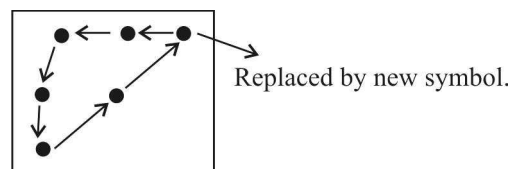
63. (a) $13 + 5 = 18$ th from you left

64. (d) $10 + 3 = 13$ th from the right

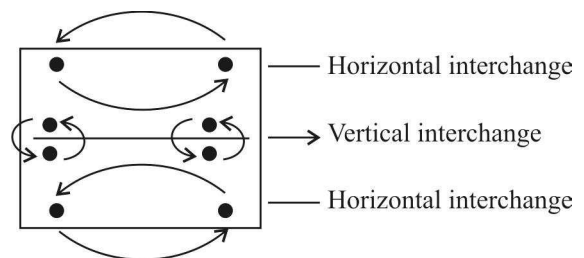
65. (e) A, L, M, E
MALE, LAME, MEAL

66. (d) Symbols in the square are rotating 90° angle clockwise.

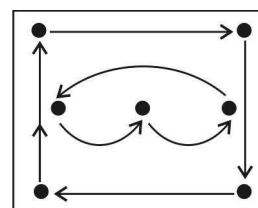
67. (e)



69. (a)



70. (c)



6

PRACTICE SET

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $\frac{1}{4}$ th of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-10) : What will come in place of question mark (?) in the following questions?

- $72.42 + 385.66 + 4976.38 = ?$
 - 5234.46
 - 5434.46
 - 5434.66
 - 5244.66
 - None of these
- $8\frac{5}{9} \times 4\frac{3}{5} - 6\frac{1}{3} = ?$
 - $32\frac{11}{45}$
 - $33\frac{11}{45}$
 - $32\frac{1}{45}$
 - $33\frac{1}{45}$
 - None of these
- $\frac{17 \times 4 + 4^2 \times 2}{90 \div 5 \times 12} = ?$
 - $\frac{25}{54}$
 - $\frac{22}{57}$
 - $\frac{11}{27}$
 - $\frac{13}{27}$
 - None of these
- 16% of 250 + 115% of 480 = ?
 - 522
 - 588
 - 582
 - 498
 - None of these
- 55% of 860 + ?% of 450 = 581
 - 24
 - 28
 - 32
 - 36
 - None of these
- $16.45 \times 2.8 + 4.5 \times 1.6 = ?$
 - 56.23
 - 56.32
 - 53.26
 - 53.66
 - None of these
- $8\frac{2}{5} \times 5\frac{2}{3} + ? = 50\frac{1}{5}$
 - $3\frac{2}{5}$
 - $2\frac{2}{5}$
 - $3\frac{3}{5}$
 - $2\frac{3}{5}$
 - None of these
- $2520 \div 14 \div 9 = ?$
 - 22
 - 18
 - 20
 - 16
 - None of these
- $\frac{5}{9}$ of 504 + $\frac{3}{8}$ of 640 = ?
 - 520
 - 480
 - 460
 - 540
 - None of these
- 3.2% of 250 + 1.8% of 400 = ?
 - 14.8
 - 15.75
 - 14.75
 - 15.2
 - None of these
- Difference between the digits of a two digit number is 5 and the digit in the unit's place is six times the digit in the ten's place. What is the number?
 - 27
 - 72
 - 16
 - 61
 - None of these

12. Populations of two villages X and Y are in the ratio of 5 : 7 respectively. If the population of village Y increases by 25000 and the population of village X remains unchanged the respective ratio of their populations becomes 25:36. What is the population of village X ?
 (a) 625000 (b) 675000
 (c) 875000 (d) 900000
 (e) None of these
13. Ajay spends 25 per cent of his salary on house rent, 5 per cent on food, 15 per cent on travel, 10 per cent on clothes and the remaining amount of ₹ 27,000 is saved. What is Ajay's income?
 (a) ₹ 60,000 (b) ₹ 80,500
 (c) ₹ 60,700 (d) ₹ 70,500
 (e) None of these
14. The length of a rectangular field is thrice its breadth. If the cost of cultivating the field at ₹ 367.20 per square metre is ₹ 27,540, then what is the perimeter of the rectangle?
 (a) 47m (b) 39m
 (c) 52m (d) 40m
 (e) None of these
15. If the fractions $\frac{8}{5}, \frac{7}{2}, \frac{9}{5}, \frac{5}{4}, \frac{4}{5}$ are arranged in descending order of their values, which one will be the fourth?
 (a) $\frac{4}{5}$ (b) $\frac{5}{4}$
 (c) $\frac{9}{5}$ (d) $\frac{8}{5}$
 (e) $\frac{7}{2}$
16. A 240 m long train crosses a 300 m long platform in 27 s. What is the speed of the train in km/h?
 (a) 66 (b) 60
 (c) 76 (d) 64
 (e) None of these
17. Vandana sells an article for ₹3240 and earns a profit of 20%. What is the cost price of the article ?
 (a) ₹2800 (b) ₹2820
 (c) ₹2750 (d) ₹2700
 (e) None of these
18. Mr. Sharma invested an amount of ₹25000 in fixed deposit @ compound interest 8% per annum for two years. What amount Mr. Sharma will get on maturity?
 (a) ₹28540 (b) ₹29160
 (c) ₹29240 (d) ₹28240
 (e) None of these
19. Four-seventh of a number is equal to 40% of another number. What is the ratio between the first number and second number respectively ?
 (a) 5 : 4 (b) 4 : 5
 (c) 10 : 7 (d) 7 : 10
 (e) None of these
20. Cost of 6 dozen apples and 8 dozen bananas is ₹ 1400. What will be the cost of 15 dozen apples and 20 dozen bananas ?
 (a) ₹ 3200 (b) ₹ 3500
 (c) ₹ 3600 (d) ₹ 4200
 (e) None of these
21. Beena and Meena started a boutique investing amounts of ₹ 35000 and ₹ 56000 respectively. If Beena's share in the profit earned by them is ₹ 45000, what is the total profit earned ?
 (a) ₹ 81000 (b) ₹ 127000
 (c) ₹ 72000 (d) ₹ 117000
 (e) None of the above
22. Nandkishore gives 35% of the money he had to his wife and gave 50% of the money he had to his sons. Remaining amount of ₹ 11250 he kept for himself. What was the total amount of money Nandkishore had ?
 (a) ₹ 63750 (b) ₹ 75000
 (c) ₹ 73650 (d) ₹ 72450
 (e) None of these
23. Simple interest accrued on an amount in eight years @ 11% per annum is ₹ 57200. What was the principal amount ?
 (a) ₹ 72000 (b) ₹ 82000
 (c) ₹ 75000 (d) ₹ 65000
 (e) None of these
24. Four-fifth of a number is 10 more than two-third of the same number. What is the number?
 (a) 70 (b) 75
 (c) 69 (d) 85
 (e) None of these
25. A shopkeeper purchased 200 bulbs for ₹ 10 each. However, 5 bulbs were fused and had to be thrown away. The remaining were sold at ₹ 12 each. What will be the percentage profit?
 (a) 25 (b) 15
 (c) 13 (d) 17
 (e) None of these
26. The average monthly income of a family of four earning members was ₹15,130. One of the daughter in the family got married and left home, so the average monthly income of the family came down to ₹ 14,660. What is the monthly income of the married daughter?
 (a) ₹ 15,350 (b) ₹ 12,000
 (c) ₹ 16,540 (d) Cannot be determined
 (e) None of these
27. On a test consisting of 250 questions, Jassi answered 40% of the first 125 questions correctly. What percent of the other 125 question does she need to answer correctly for her grade on the entire exam to be 60%?
 (a) 75 (b) 80
 (c) 60 (d) Cannot be determined
 (e) None of these
28. Swapnil, Aakash and Vinay begin to jog around a circular stadium. They complete their revolutions in 36 seconds, 48 seconds and 42 seconds respectively. After how many seconds will they be together at the starting point.
 (a) 504 seconds (b) 940 seconds
 (c) 1008 seconds (d) 470 seconds
 (e) None of these
29. Excluding the stoppages, the speed of a bus is 64 km/hr and including the stoppage the speed of the bus is 48 km/hr. For how many minutes does the bus stop per hour?
 (a) 12.5 minutes (b) 15 minutes
 (c) 10 minutes (d) 18 minutes
 (e) None of these

30. A, B, C, D and E are five consecutive odd numbers. The sum of A and C is 146. What is the value of E?
- (a) 75 (b) 81
(c) 71 (d) 79
(e) None of these

DIRECTIONS (Qs. 31-33): Study the table carefully to answer the questions that follow:

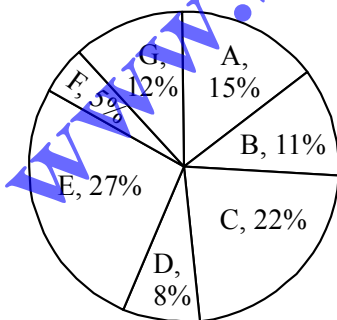
Total number of employees in different departments of an organization and (of these) percentage of females and males

Department	Total Number of Employees	Percentage of Females	Percentage of Males
IT	840	45	55
Accounts	220	35	65
Production	900	23	77
HR	360	65	35
Marketing	450	44	56
Customer Service	540	40	60

31. What is the total number of employees in all the departments together?
- (a) 3260 (b) 3310
(c) 3140 (d) 3020
(e) None of these
32. The total number of employees in the HR department forms approximately what percent of the total number of employees in the Accounts department?
- (a) 149 (b) 178 (c) 157 (d) 164 (e) 137
33. What is the total number of males in the IT and Customer Service departments together?
- (a) 687 (b) 678
(c) 768 (d) 876
(e) None of these

DIRECTIONS (Qs. 34 & 35): Seven companies A, B, C, D, E, F and G are engaged in production of two items I and II. The comparative data about production of these items by the seven companies is given in the following pie-chart and the table. Study them carefully and answer the questions given below.

Percentage of the total production produced by the seven companies



Cost of the total production (both items together) by seven companies. = ₹ 25 crores

Ratio of production between items I and II and the per cent profit earned for the two items.

Company	Ratio of Production		Per cent profit earned	
	Item I	Item II	Item I	Item II
A	2	3	25	20
B	3	2	32	35
C	4	1	20	22
D	3	5	15	25
E	5	3	28	30
F	1	4	35	25
G	1	2	30	24

34. What is the total cost of the production of item 'I' by companies A and C together in ₹ crore?
- (a) 9.25 (b) 5.9
(c) 4.1625 (d) 4.9
(e) None of these
35. What is the amount of profit earned by company 'D' on item 'II'?
- (a) ₹ 3.125 crores (b) ₹ 31.25 crores
(c) ₹ 3.125 lakhs (d) ₹ 31.25 lakhs
(e) None of these

REASONING ABILITY

DIRECTIONS (Qs. 36-40): In each of the questions below are given three statements followed by four conclusions numbered I, II, III and IV. You have to take the given statements to be true even if they seem to be at variance with commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

36. **Statement :**
- A. Some boys are rains.
B. All rains are clouds.
C. Some clouds are cars.
- Conclusions :**
- I. Some clouds are boys.
II. Some cars are boys.
III. Some cars are rains.
IV. Some rains are boys.
- (a) Only II follows (b) Only IV follows
(c) Only I follows (d) Both I and IV follow
(e) None of these
37. **Statement :**
- A. All bricks are flowers.
B. Some houses are flowers.
C. All pens are houses.
- Conclusions :**
- I. Some houses are bricks.
II. Some pens are flowers.
III. Some flowers are bricks.
IV. No pen is flower.
- (a) Only either II or IV and III follow
(b) Only either II or IV and I follow
(c) Only either I or II and IV follow
(d) Either II or IV follow
(e) None of these
38. **Statement :**
- A. All lions are ducks.
B. No duck is a horse.
C. All horses are fruits.

- Conclusions :**
- I.** No lion is a horse.
II. Some fruits are horses.
III. Some ducks are lions.
IV. Some lions are horses.
- (a) All follows
 (b) Only either I or II and both III and IV follow
 (c) Only either I or IV and both II and III follow
 (d) Neither I nor II follow
 (e) None of these

39. **Statements :**
- A.** Some stones are bricks.
B. All plants are stones.
C. No flower is a plant.
- Conclusions :**
- I.** No flower is a stone.
II. Some bricks are plants.
III. No bricks are plants.
- (a) Only I follows
 (b) Only II follows
 (c) Only III follows
 (d) Either II or III follows
 (e) None of these

40. **Statements :**
- A.** All tigers are jungles.
B. No jungle is a bird.
C. Some birds are rains.
- Conclusions :**
- I.** No rain is a jungle.
II. Some rains are jungles.
III. No bird is a tiger.
- (a) Only either II or III follows
 (b) Only I and II follow
 (c) Only either I or II and III follow
 (d) Neither II nor III follow
 (e) None of these

DIRECTIONS (Qs. 41-45) : Study the following information carefully to answer the questions that follow.

- (I) M, N, P, Q, S and T are six members of a group in which there are three female members. Females work in three departments – Accounts, Administration and Personnel and sit in three different floors – 1st, 2nd and 3rd. Persons working in the same department are not on the same floor. On each floor, two persons work.
- (II) No two ladies, work in the same department or on the same floor. N and S work in the same department but not in personnel. Q works in Administration. S and M are on the 1st and 3rd floors respectively and work in the same department. Q, a lady, does not work on 2nd floor. P, a man, works on the 1st floor.
41. Which of the following groups of persons is females ?
 (a) SQT (b) QMT
 (c) QPT (d) Data inadequate
 (e) None of these
42. T works in which department ?
 (a) Accounts (b) Administration
 (c) Personnel (d) Accounts or Personnel
 (e) None of these
43. Which of the following pairs of persons work on IIInd floor?
 (a) PT (b) SM
 (c) QN (d) Data inadequate
 (e) None of these
43. If T is transferred to Accounts and S is transferred to Administration, who is to be transferred to Personnel to maintain the original distribution of females on each floor ?

- (a) P (b) N
 (c) Q (d) Data inadequate
 (e) None of these
45. Which of the following pairs of persons works in Administration ?
 (a) QP (b) QN
 (c) SP (d) Data inadequate
 (e) None of these

DIRECTIONS (Qs. 46-50) : In each of these questions a group of letters is given followed by four combinations of numbers codes lettered (a), (b), (c) and (d). The group of letters is to be coded with the numbers codes and the condition given below. The 'serial number of the number combination'. Which correctly represents the letter group, is your answer.

Letters	D	J	K	Q	H	V	N	E	B	A
Numbers Codes	3	9	7	6	4	8	2	1	5	0

Conditions : If the first or the last letter or both in the letter group is /are a vowel then the same is/are to be coded by symbol #.

46. EHNDJV
 (a) #42389 (b) 142398
 (c) #42398 (d) 14239#
 (e) None of these
47. KQDJNH
 (a) 763942 (b) 736924
 (c) #36924 (d) #63924
 (e) None of these
48. AJNVQE
 (a) #9286# (b) 09286#
 (c) #92861 (d) 092861
 (e) None of these
49. QHJVND
 (a) 648923 (b) 649823
 (c) #49823 (d) 64892#
 (e) None of these
50. JKEDHA
 (a) 97#34# (b) 971340
 (c) 971430 (d) 97134#
 (e) None of these

DIRECTIONS : (Qs. 51-55) : In the questions given below, certain symbols are used with the following meaning:

A @ B means A is greater than B.

A + B means A is either greater than or equal to B.

A † B means A is smaller than B

A ⊗ B means A is either smaller than or equal to B.

A \$ B means A is equal to B

Now in each of the following questions assuming the given statements to be true find which of the two conclusions I and II given below them is /are definitely **true**. Give answer

(a) if only conclusion I is true.

(b) if only conclusion II is true.

(c) if either I or II is true.

(d) if neither I nor II are true.

(e) if both I and II are true.

51. **Statements :** T \$ G, K @ P, M † T, P + M

Conclusions: I. K @ M **II.** G \$ P

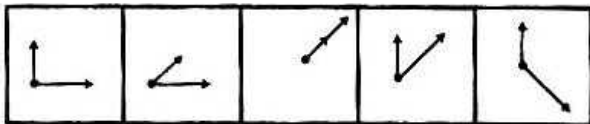
52. **Statements :** R + N, S ⊗ B, A @ N, B\$A
Conclusions: I. S\$N **II.** A@N
53. **Statements :** G\$K, F@J, K+Q, Q+F
Conclusions: I. K\$F **II.** F†K
54. **Statements :** W@S, K ⊗ Z, U+W, S\$K
Conclusions: I. U@K **II.** Z@S
55. **Statements :** G\$E, D†K, E†S, K ⊗ G
Conclusions: I. S@D **II.** D†E

DIRECTIONS (Qs. 56-58) : In each of the questions given below which one of the five answer figures should come after the problem figures, if the sequence were continued?

56. **Problem figures**

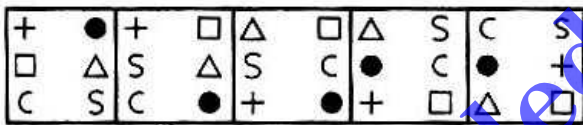


Answer figures

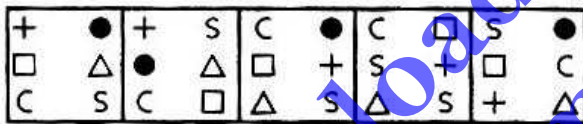


(a) (b) (c) (d) (e)

57. **Problem figures**



Answer figures



(a) (b) (c) (d) (e)

58. **Problem figures**



Answer figures



(a) (b) (c) (d) (e)

59. Four the following five are alike in a certain way and so form a group. Which is the one that does not belong to the group?
 (a) Horse (b) Dog
 (c) Camel (d) Cow
 (e) Fox
60. In a certain code RUST is written as QVRU. How is LINE written in that code?
 (a) KJMF (b) KJLI
 (c) KMJF (d) KJME
 (e) None of these

DIRECTIONS (Qs. 61-65) : Study the following information carefully and answer the given questions.

P, Q, R, S, T, V, W and X are captains of eight different cricket teams, namely Australia, New Zealand, India, Pakistan, Sri Lanka, England, West Indies and South Africa, but not necessarily in the same order. All of them are seated around a circular table and are facing the centre.

P sits third to the left of the Sri Lankan captain. Only two people sit between T and W. Neither T nor W is an immediate neighbour of P. Neither T and W is the captain of Sri Lanka. The captain of South Africa sits second to the right of S. S is not an immediate neighbour of P. S is not the Sri Lankan captain and P is not the captain of South Africa. The Australian captain sits third to the left of V. The Australian and Sri Lankan captains are not immediate neighbours. Only one person sits between S and the Indian captain. Captains of Pakistan and New Zealand are immediate neighbours. S is not the captain of New Zealand's team. Only one person sits between Q and the captain of England. The captain of England is an immediate neighbour of X. W and Q are not immediate neighbours.

61. How many people sit between T and the captain of England when counted in clockwise direction from T?
 (a) None (b) One (c) Two (d) Four (e) Five
62. Who is the captain of the Australian team?
 (a) P (b) V (c) W (d) T (e) Q
63. Which of the following would come in place of question mark based upon the given seating arrangement?
 VS XR TV RP ?
 (a) SW (b) WX (c) QW (d) QX (e) VR
64. Which of the following is **true** with respect to the given arrangement?
 (a) R is the captain of South Africa
 (b) W is an immediate neighbour of V.
 (c) The captain of Australia and England are immediate neighbours.
 (d) Four people sit between W and Q.
 (e) X sits second to the left of S.
65. Who is the Indian captain?
 (a) Q (b) V
 (c) X (d) T
 (e) Cannot be determined

DIRECTIONS (Qs. 66-68) : Study the given information carefully and answer the given questions.

Among six people - A, B, C, D, E and F each of a different age, A is younger than only D. Only three people are younger than C. F is younger than E. F is not the youngest.

66. Who amongst the following is the youngest?
 (a) B (b) A
 (c) E (d) C
 (e) None of these
67. If E's age 16 years, then which of the following may be B's age?
 (a) 19 years (b) 22 years
 (c) 18 years (d) 17 years
 (e) 12 years

68. How many people are younger than E?
 (a) One (b) Two
 (c) Three (d) Four
 (e) More than four

DIRECTIONS (Qs. 69 & 70): Study the given information carefully and answer the given questions.

Twenty students are standing in a straight line facing north. Rina is standing sixth from the left end. There are only three students between Rina and Shweta. Radha is standing exactly between Shweta and Rina. Tina is standing sixth to the right of Radha. Anita is standing fourth from the right end of the line. There are more than four students between Rina and Tina.

69. How many people are standing between Anita and Tina.
 (a) One (b) Two
 (c) Three (d) None
 (e) More than three
70. What is Shweta's position with respect to Anita?
 (a) Sixth to the left (b) Eighth to the left
 (c) Seventh to the left (d) Ninth to the left
 (e) None of these

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-78): Read the following passage carefully and answer the questions given below it.

In the second week of August 1998, just a few days after the incidents of bombing the US embassies in Nairobi and Dar-es-Salaam, a high-powered, brain-storming session was held near Washington D.C., to discuss various aspects of terrorism. The meeting was attended by ten of America's leading experts in various fields such as germ and chemical warfare, public health, disease control and also by the doctors and the law-enforcing officers. Being asked to describe the horror of possible bio-attack, one of the experts narrated the following gloomy scenario.

A culprit in a crowded business centre or in a busy shopping mall of a town empties a test tube containing some fluid, which in turn creates an unseen cloud of germs of a dreaded disease like anthrax capable of inflicting a horrible death within 5 days on any one who inhales it. At first 500 or so victims feel that they have mild influenza which may recede after a day or two. Then the symptoms return again and their lungs start filling with fluid. They rush to local hospitals for treatment, but the panic-stricken people may find that the medicare services run quickly out of drugs due to excessive demand. But no one would be able to realise that a terrorist attack has occurred. One cannot deny the possibility that the germs involved would be of contagious variety capable of causing an epidemic. The meeting concluded that such attacks, apart from causing immediate human tragedy, would have dire long-term effects on the political and social fabric of a country by way of ending people's trust on the competence of the government.

The experts also said that the bombs used in Kenya and Tanzania were of the old-fashioned variety and involved quantities of high explosives, but new terrorism will prove to be more deadly and probably more elusive than hijacking an aeroplane or a gelignite of previous decades. According to Bruce Hoffman, an American specialist on political violence, old terrorism generally had a specific manifesto - to overthrow a colonial power or the capitalist system and so on. These terrorists were not shy

about planting a bomb or hijacking an aircraft and they set some limit to their brutality. Killing so many innocent people might turn their natural supporters off. Political terrorists want a lot of people watching but not a lot of people dead. "Old terrorism sought to change the world while the new sort is often practised by those who believe that the world has gone beyond redemption", he added.

Hoffman says, "New terrorism has no long-term agenda but is ruthless in its short-term intentions. It is often just a cacophonous cry of protest or an outburst of religious intolerance or a protest against the West in general and the US in particular. Its perpetrators may be religious fanatics or diehard opponents of a government and see no reason to show restraint. They are simply intent on inflicting the maximum amount of pain on the victim."

71. In the context of the passage, the culprit's act of emptying a test tube containing some fluid can be classified as
 (a) a terrorist attack
 (b) an epidemic of a dreaded disease
 (c) a natural calamity
 (d) panic created by an imaginary event
 (e) None of these
72. In what way would the new terrorism be different from that of the earlier years?
 A. More dangerous and less baffling
 B. More hazardous for victims
 C. Less complicated for terrorists
 (a) A and C only (b) B and C only
 (c) A and B only (d) All the three
 (e) None of these
73. What was the immediate provocation for the meeting held in August 1998?
 (a) the insistence of America's leading
 (b) the horrors of possible bio-attacks
 (c) a culprit's heinous act of spreading germs
 (d) people's lack of trust in the government
 (e) None of these
74. What could be the probable consequences of bio-attacks, as mentioned in the passage?
 A. several deaths
 B. political turmoil
 C. social unrest
 (a) A only (b) B only
 (c) C only (d) A and B only
 (e) All the three
75. The author's purpose of writing the above passage seems to explain
 (a) the methods of containing terrorism
 (b) the socio-political turmoil in African countries
 (c) the deadly strategies adopted by modern terrorists
 (d) reasons for killing innocent people
 (e) the salient features of terrorism of yester years
76. According to the author of the passage, the root cause of terrorism is
 A. religious fanaticism
 B. socio-political changes in countries
 C. the enormous population growth
 (a) A only (b) B only
 (c) C only (d) A and B only
 (e) All the three

77. The phrase “**such attacks**”, as mentioned in the last sentence of the second paragraph, refers to
 (a) the onslaught of an epidemic as a natural calamity
 (b) bio-attack on political people in the government
 (c) attack aimed at damaging the reputation of the government
 (d) bio-attack monoeuvred by unscrupulous elements
 (e) None of these
78. The sole objective of the old terrorism, according to Hoffman, was to
 (a) plant bombs to kill innocent people
 (b) remove colonial power or capitalist system
 (c) make people realise the incompetence of the government
 (d) give a setback to the socio-political order
 (e) None of these

DIRECTIONS (Qs. 79-83) : Below each sentence are given four possible substitutions for the **bold part**. If one of them (a), (b), (c) or (d) is better than the bold part, indicate your response on the Answer Sheet against the corresponding letter (a), (b), (c) or (d). If none of the substitutions improves the sentence, indicate (e) as your response on the Answer Sheet. Thus a ‘No’ improvement’ response will be signified by the letter (e). Errors may be in grammar, appropriate word usage or idioms. There may be a necessary word missing or there may be a word which should be removed.

79. It was my business to cross the bridge to explore the bridgehead and to find out **the extent to which** the enemy had advanced.
 (a) how much (b) the extent where
 (c) the point till where (d) limit at which
 (e) No improvement
80. The world is becoming increasingly polarised **between the rich** and the poor.
 (a) among rich (b) around the rich
 (c) in between the rich (d) amid rich persons
 (e) No improvement
81. I **laid all the facts before him** so that he could make his own judgement.
 (a) laid all the facts in front of him
 (b) lay all the facts before him
 (c) lay all the facts in front of him
 (d) did I lay all the facts before his
 (e) No improvement
82. If only she had told me about her problem I **would have helped her**.
 (a) would help (b) could help
 (c) had helped (d) would not help
 (e) No improvement
83. Apollo was worshipped as long as the Roman Empire **continued**.
 (a) was continued (b) ruled
 (c) lasted (d) did not exist
 (e) No improvement

DIRECTIONS (Qs. 84 - 88) : In each of the following sentences, an idiomatic expression or a proverb is highlighted. Select the alternative which best describes its use in the sentence.

84. Turban **is in vogue** in some communities.
 (a) in fashion (b) out of use
 (c) vaguely used (d) never used
 (e) none of these
85. The old man was **cut to the quick** when his rich son refused to recognise him.
 (a) surprised (b) hurt intensely
 (c) annoyed (d) irritated
 (e) none of these
86. I requested him to **put in a word for me**.
 (a) introduce (b) assist
 (c) support (d) recommend
 (e) none of these
87. The dacoit murdered the man **in cold blood**.
 (a) coldly (b) boldly
 (c) ruthlessly (d) deliberately
 (e) none of these
88. He is always **picking holes** in every project.
 (a) creating problems in
 (b) finding fault with
 (c) suggesting improvement in
 (d) asking irrelevant questions on
 (e) None of these

DIRECTIONS (Qs. 89-96) : In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

The Government seems to be in right earnest to ensure more **89** in governance. The Prime Minister’s announcement that his Government is **90** drafting legislation to establish the citizen’s right to information is indeed welcome. Though the talk on the right to information is not new, we may **91** the bill to be brought early this time. The previous Government had set up a high-level committee to prepare a draft bill. But nothing has been heard about the matter since, **92** the committee did quite some work. The issue, however, has come to such a pass that a solution cannot be **93** further. Sunlight is the best disinfectant, a foreign judge once said, while **94** the unwarranted secrecy in an administrative system. When those in authority know that people have the right to ask questions and the government is under the **95** to provide them with answers, **96** of authority, or of public finances, for personal or party ends is less likely to happen.

89. (a) strictness (b) rudeness
 (c) leniency (d) economy
 (e) transparency
90. (a) personally (b) busy
 (c) not (d) reluctantly
 (e) absolutely
91. (a) expect (b) wait
 (c) try (d) frustrate
 (e) appeal
92. (a) even (b) as
 (c) because (d) until
 (e) though
93. (a) found (b) expected
 (c) delayed (d) looked
 (e) longed

94. (a) nurturing (b) criticising
(c) demanding (d) appreciating
(e) upholding
95. (a) pretention (b) affect
(c) substance (d) obligation
(e) property
96. (a) misuse (b) governance
(c) dishonour (d) curbing
(e) breach
98. The judge used his _____ in settling the matter.
(a) know (b) tactics
(c) discretion (d) brains
(e) bias
99. The reward was shared _____ the members of the cricket team.
(a) among (b) for
(c) to (d) against
(e) between
100. The captain is very _____ of his cricket team,
(a) pride (b) good
(c) eager (d) proud
(e) strict

DIRECTIONS (Qs. 97-100) : Pick out the most effective word from the given words to fill in the blanks to make the sentence meaningfully complete.

97. One has to be very _____ during the monsoons as the road becomes slippery.
(a) smart (b) cautious
(c) presentable (d) prepared
(e) healthy

RESPONSE SHEET

- | | | | | |
|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|
| 1. (a) (b) (c) (d) (e) | 2. (a) (b) (c) (d) (e) | 3. (a) (b) (c) (d) (e) | 4. (a) (b) (c) (d) (e) | 5. (a) (b) (c) (d) (e) |
| 6. (a) (b) (c) (d) (e) | 7. (a) (b) (c) (d) (e) | 8. (a) (b) (c) (d) (e) | 9. (a) (b) (c) (d) (e) | 10. (a) (b) (c) (d) (e) |
| 11. (a) (b) (c) (d) (e) | 12. (a) (b) (c) (d) (e) | 13. (a) (b) (c) (d) (e) | 14. (a) (b) (c) (d) (e) | 15. (a) (b) (c) (d) (e) |
| 16. (a) (b) (c) (d) (e) | 17. (a) (b) (c) (d) (e) | 18. (a) (b) (c) (d) (e) | 19. (a) (b) (c) (d) (e) | 20. (a) (b) (c) (d) (e) |
| 21. (a) (b) (c) (d) (e) | 22. (a) (b) (c) (d) (e) | 23. (a) (b) (c) (d) (e) | 24. (a) (b) (c) (d) (e) | 25. (a) (b) (c) (d) (e) |
| 26. (a) (b) (c) (d) (e) | 27. (a) (b) (c) (d) (e) | 28. (a) (b) (c) (d) (e) | 29. (a) (b) (c) (d) (e) | 30. (a) (b) (c) (d) (e) |
| 31. (a) (b) (c) (d) (e) | 32. (a) (b) (c) (d) (e) | 33. (a) (b) (c) (d) (e) | 34. (a) (b) (c) (d) (e) | 35. (a) (b) (c) (d) (e) |
| 36. (a) (b) (c) (d) (e) | 37. (a) (b) (c) (d) (e) | 38. (a) (b) (c) (d) (e) | 39. (a) (b) (c) (d) (e) | 40. (a) (b) (c) (d) (e) |
| 41. (a) (b) (c) (d) (e) | 42. (a) (b) (c) (d) (e) | 43. (a) (b) (c) (d) (e) | 44. (a) (b) (c) (d) (e) | 45. (a) (b) (c) (d) (e) |
| 46. (a) (b) (c) (d) (e) | 47. (a) (b) (c) (d) (e) | 48. (a) (b) (c) (d) (e) | 49. (a) (b) (c) (d) (e) | 50. (a) (b) (c) (d) (e) |
| 51. (a) (b) (c) (d) (e) | 52. (a) (b) (c) (d) (e) | 53. (a) (b) (c) (d) (e) | 54. (a) (b) (c) (d) (e) | 55. (a) (b) (c) (d) (e) |
| 56. (a) (b) (c) (d) (e) | 57. (a) (b) (c) (d) (e) | 58. (a) (b) (c) (d) (e) | 59. (a) (b) (c) (d) (e) | 60. (a) (b) (c) (d) (e) |
| 61. (a) (b) (c) (d) (e) | 62. (a) (b) (c) (d) (e) | 63. (a) (b) (c) (d) (e) | 64. (a) (b) (c) (d) (e) | 65. (a) (b) (c) (d) (e) |
| 66. (a) (b) (c) (d) (e) | 67. (a) (b) (c) (d) (e) | 68. (a) (b) (c) (d) (e) | 69. (a) (b) (c) (d) (e) | 70. (a) (b) (c) (d) (e) |
| 71. (a) (b) (c) (d) (e) | 72. (a) (b) (c) (d) (e) | 73. (a) (b) (c) (d) (e) | 74. (a) (b) (c) (d) (e) | 75. (a) (b) (c) (d) (e) |
| 76. (a) (b) (c) (d) (e) | 77. (a) (b) (c) (d) (e) | 78. (a) (b) (c) (d) (e) | 79. (a) (b) (c) (d) (e) | 80. (a) (b) (c) (d) (e) |
| 81. (a) (b) (c) (d) (e) | 82. (a) (b) (c) (d) (e) | 83. (a) (b) (c) (d) (e) | 84. (a) (b) (c) (d) (e) | 85. (a) (b) (c) (d) (e) |
| 86. (a) (b) (c) (d) (e) | 87. (a) (b) (c) (d) (e) | 88. (a) (b) (c) (d) (e) | 89. (a) (b) (c) (d) (e) | 90. (a) (b) (c) (d) (e) |
| 91. (a) (b) (c) (d) (e) | 92. (a) (b) (c) (d) (e) | 93. (a) (b) (c) (d) (e) | 94. (a) (b) (c) (d) (e) | 95. (a) (b) (c) (d) (e) |
| 96. (a) (b) (c) (d) (e) | 97. (a) (b) (c) (d) (e) | 98. (a) (b) (c) (d) (e) | 99. (a) (b) (c) (d) (e) | 100. (a) (b) (c) (d) (e) |

Answer Key

1	(b)	11	(c)	21	(d)	31	(b)	41	(a)	51	(a)	61	(c)	71	(a)	81	(e)	91	(a)
2	(d)	12	(a)	22	(b)	32	(d)	42	(c)	52	(b)	62	(a)	72	(b)	82	(e)	92	(e)
3	(a)	13	(a)	23	(d)	33	(e)	43	(e)	53	(c)	63	(b)	73	(e)	83	(c)	93	(c)
4	(e)	14	(d)	24	(b)	34	(b)	44	(c)	54	(e)	64	(c)	74	(e)	84	(a)	94	(b)
5	(a)	15	(b)	25	(d)	35	(d)	45	(d)	55	(e)	65	(d)	75	(c)	85	(b)	95	(d)
6	(c)	16	(e)	26	(c)	36	(e)	46	(c)	56	(d)	66	(a)	76	(a)	86	(d)	96	(a)
7	(d)	17	(d)	27	(b)	37	(a)	47	(e)	57	(c)	67	(e)	77	(d)	87	(c)	97	(b)
8	(c)	18	(b)	28	(c)	38	(c)	48	(a)	58	(b)	68	(b)	78	(d)	88	(b)	98	(c)
9	(a)	19	(d)	29	(b)	39	(d)	49	(b)	59	(e)	69	(b)	79	(c)	89	(e)	99	(a)
10	(d)	20	(b)	30	(d)	40	(c)	50	(d)	60	(a)	70	(c)	80	(e)	90	(b)	100	(d)

Answers & Explanations

1. (b) $? = 72.42 + 385.66 + 4976.38$
 $\Rightarrow ? = 5434.46$

$$\Rightarrow \frac{?}{100} \times 450 = 581 - 473 = 108$$

2. (d) $? = 8\frac{5}{9} \times 4\frac{3}{5} - 6\frac{1}{3}$

$$\Rightarrow ? = \frac{77}{9} \times \frac{23}{5} - \frac{19}{3}$$

$$\Rightarrow ? = \frac{1771 - 285}{45}$$

$$\Rightarrow ? = \frac{1486}{45} = 33\frac{1}{45}$$

3. (a) $? = \frac{17 \times 4 + 4^2 \times 2}{90 \div 5 \times 12}$

$$\Rightarrow ? = \frac{68 + 16 \times 2}{18 \times 12}$$

$$\Rightarrow ? = \frac{68 + 32}{216}$$

$$\Rightarrow ? = \frac{100}{216} = \frac{25}{54}$$

4. (e) $? = 16\% \text{ of } 250 + 115\% \text{ of } 480$

$$\Rightarrow ? = \frac{16}{100} \times 250 + \frac{115}{100} \times 480$$

$$\Rightarrow ? = \frac{4000}{100} + \frac{55200}{100}$$

$$\Rightarrow ? = 40 + 552 = 592$$

5. (a) $55\% \text{ of } 860 + ?\% \text{ of } 450 = 581$

$$\Rightarrow \frac{55}{100} \times 860 + \frac{?}{100} \times 450 = 581$$

$$\Rightarrow 473 + \frac{?}{100} \times 450 = 581$$

$$\Rightarrow ? = \frac{108 \times 100}{450} = 24$$

6. (c) $? = 16.45 \times 2.8 + 4.5 \times 1.6$
 $\Rightarrow ? = 46.06 + 7.20$
 $\Rightarrow ? = 53.26$

7. (d) $8\frac{2}{5} \times 5\frac{2}{3} + ? = 50\frac{1}{5}$

$$\Rightarrow \frac{42}{5} \times \frac{17}{3} + ? = \frac{251}{5}$$

$$\Rightarrow \frac{238}{5} + ? = \frac{251}{5}$$

$$\Rightarrow ? = \frac{251}{5} - \frac{238}{5}$$

$$\Rightarrow ? = \frac{13}{5} = 2\frac{3}{5}$$

8. (c) $? = 2520 \div 14 \div 9$

$$\Rightarrow ? = 180 \div 9 = 20$$

9. (a) $? = \frac{5}{9} \text{ of } 504 + \frac{3}{8} \text{ of } 640$

$$\Rightarrow ? = \frac{5}{9} \times 504 + \frac{3}{8} \times 640$$

$$\Rightarrow ? = 280 + 240$$

$$\Rightarrow ? = 520$$

10. (d) $? = 3.2\% \text{ of } 250 + 1.8\% \text{ of } 400$

$$\Rightarrow ? = \frac{3.2}{100} \times 250 + \frac{1.8}{100} \times 400$$

$$\Rightarrow ? = \frac{800}{100} + \frac{720}{100}$$

$$\Rightarrow ? = 8 + 7.2 = 15.2$$

11. (c) Let ten's digit = x and units digit = $x + 5$

$$\text{Then, } x + 5 = 6x$$

$$x = 1$$

$$\therefore \text{units digit} = x + 5 = 1 + 5 = 6$$

$$\text{So required number} = 16$$

12. (a) Let the population of village X and Y be $5p$ and $7p$ respectively.

If population of village Y , increases by 25000

$$\text{the new ratios} \rightarrow \frac{5p}{7p + 25000} = \frac{25}{36}$$

$$\Rightarrow 180p = 175p + 625000$$

$$\Rightarrow 5p = 625000$$

13. (a) Saving percentage = $(100 - 55)\% = 45\%$

If the income of Ajay be ₹ x , then,

$$\frac{45 \times x}{100} = 27000$$

$$\Rightarrow x = \frac{27000 \times 100}{45} = ₹ 60000$$

14. (d) Let the breadth of the rectangle be x metre.

$$\therefore \text{Length} = 3x \text{ metre}$$

$$\therefore 3x \times x = \frac{27540}{367.20} = 75$$

$$\Rightarrow x^2 = 25$$

$$\Rightarrow x = 5$$

\therefore Perimeter of the rectangle

$$= 2(3x + x) = 8x$$

$$= 8 \times 5 = 40 \text{ metre}$$

15. (b) Decimal equivalent of each fraction :

$$\frac{8}{5} = 1.6; \frac{7}{2} = 3.5$$

$$\frac{9}{5} = 1.8; \frac{5}{4} = 1.25$$

$$\frac{4}{5} = 0.8$$

$$\text{Clearly, } \frac{7}{2} > \frac{9}{5} > \frac{8}{5} > \frac{5}{4} > \frac{4}{5}$$

16. (e) Total length (distance) = $240 + 300 = 540 \text{ m}$

$$\therefore \text{Speed of train} = \frac{540}{27} = 20 \text{ m/s} = 20 \times \frac{18}{5} = 72 \text{ km/h}$$

17. (d) Cost prize of the article

$$= 3240 \times \frac{100}{(100 + 20)} = 3240 \times \frac{100}{120} = ₹ 2700$$

18. (b) Required amount = $25000 \left(1 + \frac{8}{100}\right)^2$

$$= 25000 \times \frac{27}{25} \times \frac{27}{25} = ₹ 29160$$

19. (d) Let first number = x
and second number = y

$$\text{Then, } \frac{4}{7} \text{ of } x = 40\% \text{ of } y$$

$$\Rightarrow \frac{4}{7} \times x = \frac{40}{100} \times y$$

$$\Rightarrow \frac{4}{7} \times x = \frac{2}{5} \times y$$

$$\Rightarrow 10x = 7y$$

$$\Rightarrow \frac{x}{y} = \frac{7}{10} = 7:10$$

20. (b) \therefore Cost prize of (6 dozen apples + 8 dozen bananas) = ₹ 1400

$$\therefore \text{Cost prize of (15 dozen apples + 20 dozen bananas)} = 1400 \times 2.5 = ₹ 3500$$

21. (d) Amount ratio between Beena and Meena

$$= 35000 : 56000 = 5 : 8$$

Let the share of Beena and Meena amount be $5x$ and $8x$ respectively.

$$\text{Then, } 5x = 45000$$

$$\Rightarrow x = \frac{45000}{5} = ₹ 9000$$

$$\therefore \text{Amount (profit) of Meena} = 8x = 8 \times 9000 = ₹ 72000$$

$$\text{So, total earned profit} = 45000 + 72000 = ₹ 117000$$

22. (b) Let Nand Kishore's total money was = ₹ x

After giving some amount to his wife and his sons, remaining amount

$$= x - \left(x \times \frac{35}{100} + x \times \frac{50}{100}\right) = x - \frac{85x}{100} = ₹ \frac{15x}{100}$$

$$\text{Then, } \frac{15x}{100} = ₹ 11250$$

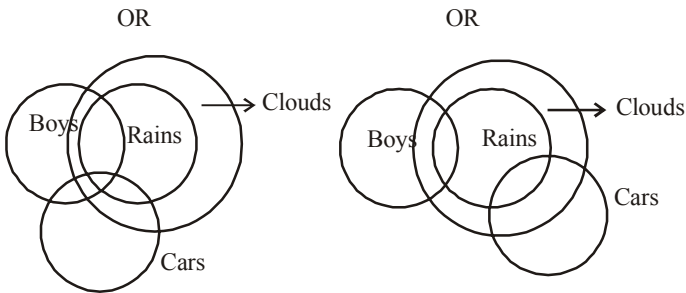
$$\Rightarrow x = \frac{11250 \times 100}{15} = ₹ 75000$$

23. (d) Let principal amount = x

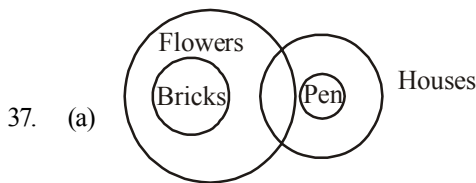
$$\text{Then, } 57200 = \frac{x \times 11 \times 8}{100}$$

$$\Rightarrow x = \frac{57200 \times 100}{11 \times 8} = ₹ 65000$$

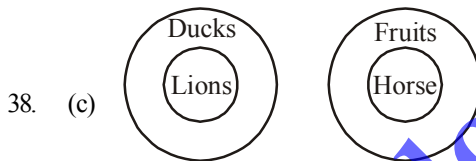
24. (b) Let the number be x .
- $$\therefore \frac{4x}{5} = \frac{2}{3}x + 10$$
- $$\Rightarrow \frac{4x}{5} - \frac{2x}{3} = 10$$
- $$\Rightarrow \frac{12x - 10x}{15} = 10$$
- $$\Rightarrow x = \frac{10 \times 15}{2} = 75$$
25. (d) Total cost price = $200 \times 10 = ₹ 2000$
Total selling price = $12 \times 195 = ₹ 2340$
- $$\therefore \text{Profit per cent} = \frac{2340 - 2000}{2000} \times 100 = 17\%$$
26. (c) \Rightarrow Total income of the four-membered family
= $4 \times 15430 = ₹ 60520$
 \Rightarrow Total income of three family members
= $3 \times 14660 = ₹ 43980$
 \Rightarrow Monthly income of the married daughter
= $60520 - 43980 = ₹ 16540$
27. (b) Total correct questions for getting 60% grade
= $250 \times \frac{60}{100} = 150$
40% of 125 = 50 questions
 $\therefore x\%$ of 125 = $150 - 50 = 100$ questions
 $\Rightarrow x = \frac{100 \times 100}{125} = 80$
Required percentage = 80%
Note: This can be solved by alligation method quickly.
Try it.
28. (c) LCM of 36 sec, 48 sec and 42 sec = 1008 sec
 \therefore After 1008 seconds, they will be together at the starting point.
29. (b) Stoppage time per hour
= $\frac{64 - 48}{64} \times \frac{1}{4} \times 60 = \frac{1}{4}$ hr = 15 minutes
30. (d) Let the numbers A, B, C, D and E be $x, x + 2, x + 4, x + 6$ and $x + 8$ respectively.
Now, $A + C = 146$
 $\Rightarrow x + x + 4 = 146$
 $\Rightarrow 2x = 142 \Rightarrow x = 71$
 \therefore Value of E = $71 + 8 = 79$
31. (b) Total no. of employees
= $(840 + 220 + 900 + 360 + 450 + 540)$
= 3310
32. (d) Required % = $\frac{360}{220} \times 100 \approx 164\%$
33. (e) Total no. of male employees in IT and Customer Service
= $840 \times \frac{55}{100} + 540 \times \frac{60}{100} = 462 + 324 = 786$
34. (b) Cost of production of both items for
Company A = $\frac{15}{100} \times 25$
= 3.75 crores
Company C = $\frac{22}{100} \times 25$
= ₹ 5.5 crores
These costs will be divided in the ratio of production of items I and II.
Cost of production of item I for
Company A = $\frac{2}{2+3} \times 3.75 = ₹ 1.5$ crores
Company C = $\frac{4}{4+1} \times 5.5 = ₹ 4.4$ crores
 \therefore Total cost of production of item I by companies A and C together
= ₹ $(1.5 + 4.4)$ crores
= ₹ 5.9 crores
35. (d) Cost of production of both items for company D
= $\frac{81}{100} \times 25 = ₹ 2$ crores
Cost of production of item II for company D
= $\frac{5}{3+5} \times 2 = ₹ \frac{5}{4}$ crores
% profit earned by company D on item II = 25%
 \therefore Amount of profit earned by company D on item II.
= $\frac{25}{100} \times \frac{5}{4} = ₹ \frac{5}{16}$ crores
= ₹ $\frac{5}{16} \times 100$ lakhs
= ₹ 31.25 lakhs
36. (e)
-



- Conclusion - I. ✓
 II. ✓
 III. ✓
 IV. ✓ (Conversion of I Statement)



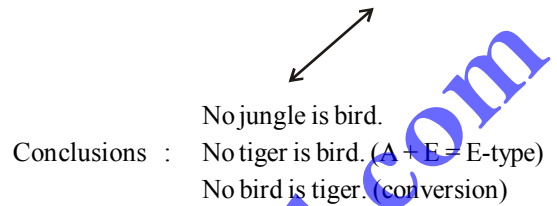
- Conclusion - I. ×
 II. ×
 III. ✓
 IV. × } Either



- Conclusion - I. ✓
 II. ✓
 III. ✓
 IV. ✓ } Either

39. (d) Statements : Some stones are bricks.
 Conclusions : Some bricks are stone. (conversion)
 Statements : All plants are stones.
 Conclusions : Some plants are stones. (Implication)
 Some stones are plants. (conversion)
 Statements : No flower is plant.
 Conclusions : Some flowers are not plant. (Implication)
 No plant is flower. (Conversion)
 Statements : No flower is plant.
 All plants are stones.
 Conclusions : Some stones are not flower. (E + A = O* type)
 Since, II and III form a complementary I-E pair, either of two must follow.

40. (c) Statements : All tigers are jungles.
 Conclusions : Some tigers are jungles. (Implication)
 Some jungles are tigers. (conversion)
 Statements : No jungle is bird.
 Conclusions : Some jungle are not bird. (Implication)
 No bird is jungle. (conversion)
 Statements : Some birds are rains.
 Conclusions : Some rains are birds. (conversion)
 Statements : All tigers are jungles.



- Hence III follows.
 Statements : No jungle is bird.
 Some birds are rains.
 Conclusions : Some rains are not jungle. (E + I = O* type)
 Since I and II form a complementary E-I pair, either of two must follow.

For (Qs. 41-45)

The given information can be summarized as follows.

	Floors					
	I		II		III	
Member	P	S	N	T	M	Q
Department	Not clear	Acc	Acc	Per-sonnel	Acct.	Adm.
Sex	M	F	M	F	M	F

41. (a) From the analysis of table constructed above, SQT is the group of females.
 42. (c) Clearly, T works in personnel.
 43. (e) N and T work on the second floor.
 44. (c) To maintain the original distribution of females on each floor, Q must be transferred to personnel.
 45. (d) Data is inadequate to determine the department of P. From the information provided only we can say that Q works in administration.

46. (c)

Letter	E	H	N	D	J	V
Code	#	4	2	3	9	8

Condition is applied.

47. (e)

Letter	K	Q	D	J	N	H
Code	7	6	3	9	2	4

48. (a)

Letter	A	J	N	V	Q	E
Code	#	9	2	8	6	#

Condition is applied.

49. (b)

Letter	Q	H	J	V	N	D
Code	6	4	9	8	2	3

50. (d)

Letter	J	K	E	D	H	A
Code	9	7	1	3	4	#

Condition is applied.

51. (a) $T = G, K > P, M < T, P \geq M$
 $K > P \geq M < T = G$

Conclusions: I. $K > M$ (✓)
 II. $G = P$ (×)

Hence, only conclusion I is true.

52. (b) $R \geq N, S \leq B, A > N, B = A$
 $S \leq B = A > N \leq R$

Conclusions: I. $S = N$ (×)
 II. $A > N$ (✓)

Hence, only conclusion II is true.

53. (c) $G = K, F > J, K \geq Q, Q \leq F$
 $G = K \geq Q \geq F > J$

Conclusions: I. $K = K$ (✓) Either
 II. $F < K$ (✓)

Hence, either I or II is true.

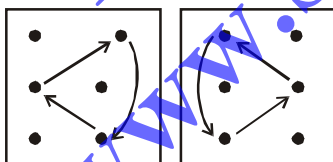
54. (e) $W > S, K \leq Z, U \geq W, S = K$
 $U \geq W > S = K \leq Z$

Conclusions: I. $U > K$ (✓)
 II. $Z > S$ (✓)

55. (e) $G = E$ (i), $D < K$... (ii), $E < S$ (iii), $K \leq G = E < S$.
 Clearly, both conclusions I and II follow.

56. (d) The smaller arrow moves through 90° and 45° anticlockwise respectively while the bigger one moves through 135° in each subsequent figure clockwise.

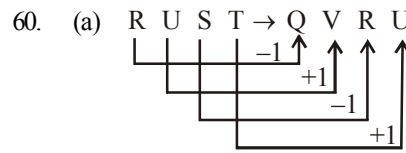
57. (c) The movement of design is as follows:



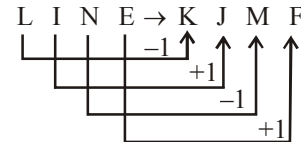
Problem fig. 1 to 2 Problem fig. 2 to 3
 Problem fig. 3 to 4 Problem fig. 4 to 5
 Problem fig. 5 to answer fig. 6

59. (b) In each subsequent figure the design \square moves through 90° anticlockwise and shifts diagonally halfway while the arrow shifts halfway diagonally and is each time inverted.

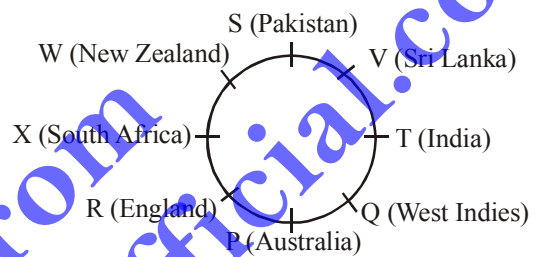
59. (e) Except fox, all others are domestic animals.



Similarly,

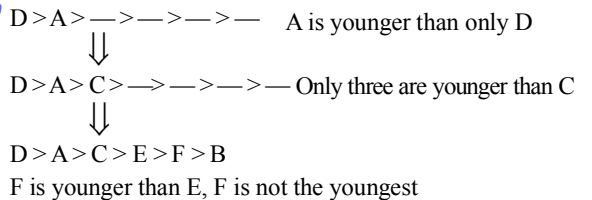


(61-65):



63. (b) There is pattern of going from second member of a pair to the first member of the next pair: +2, +3, +4 ... CW.

(Qs. 66-68). According to given information



67. (e) (B is younger than E)
 68. (b) (Only two F and B)

(Qs. 69-70).

According to information given
 Final arrangement is as follows
 1 2 3 4 5 Rina 7 Radha 9 Shweta 11 12 13 Tina 15 16 Anita
 18 19 20.

69. (b) Two person are between Anita and Tina.
 70. (c) Anita is at 17th position and Shweta at 10th position.
 71. (a) Ascertain the hidden meaning of the sentence. "but no one would be able to realise that a terrorist attack has occurred". So, undoubtedly the culprit's act can be classified as a terrorist attack.
 72. (b) "New terrorism has no long-term agenda but its ruthless in its short-term intentions". This statement from the passage supports (b). While in the light of passage, (c) also seems suitable.

73. (e) The immediate provocation for the meeting held in August 1998 has not been given among the options. It was the incidents of bombing the U.S. embassies in Nairobi and Dar-es-Salaam.
74. (e) Bio-attack will result in several deaths which will lead to political turmoil creating social unrest.
76. (a) 'Religious intolerance', as cited in the last paragraph stands behind terrorism.
79. (c) The correct sentence should read, 'It was my business to cross the bridge to explore the bridgehead and to find out the point till where the enemy had advanced'. Therefore, (c) is the correct answer, the reason being the enemy had already advanced to that place, therefore it's a particular point or destination' the other two options the extent where and how much means the exact point or location is unknown. Therefore these options are not correct.
80. (e) This sentence is grammatically correct. None of the suggested changes will improve it. So, the option (e) is the correct answer.
81. (e) This sentence is correct. None of the changes suggested will improve it. So, the option (e) is the correct answer.
82. (e) This sentence is grammatically correct. None of the changes suggested will improve it. So, the option (e) is the correct answer.
83. (c) The correct sentence should read, 'Appollo was worshipped as long as the Roman empire 'lasted' therefore, option (c) is the correct answer. The reason being, Apollo was worshipped till the Roman empire was there; therefore 'lasted' fits in best, the other two options, was continued or ruled are incorrect.

7

PRACTICE SET

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $\frac{1}{4}$ th of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-10): What will come in place of the question mark (?) in the following questions.

1. $\frac{5}{11}$ of $\frac{4}{5}$ of $\frac{11}{6}$ of 848 = ?

- (a) 216 (b) 222
(c) 208 (d) 212
(e) None of these

2. 1.4% of 750 + 2.2% of 480 = ?

- (a) 21.06 (b) 21.16
(c) 20.88 (d) 21.18
(e) None of these

3. $\frac{3}{4}$ of 116 - $\frac{2}{3}$ of 87 = ?

- (a) 31 (b) 27
(c) 29 (d) 26
(e) None of these

4. $6.96 \div 1.2 - 18.24 \div 7.6 = ?$

- (a) 3.4 (b) 3.14
(c) 3.04 (d) 3.24
(e) None of these

5. 136% of 250 + ? % of 550 = 670

- (a) 64 (b) 55
(c) 56 (d) 65
(e) None of these

6. $\frac{14 \times 25 - 5^3}{24 \times 5 + 8 \times 9} = ?$

- (a) $1\frac{9}{64}$ (b) $\frac{64}{75}$

(c) $1\frac{11}{64}$

(d) $1\frac{11}{75}$

(e) None of these

7. $17\frac{2}{5} \times 4\frac{5}{8} - ? = 46\frac{7}{8}$

(a) $32\frac{3}{5}$

(b) $33\frac{3}{5}$

(c) $33\frac{2}{5}$

(d) $32\frac{2}{5}$

(e) None of these

8. $5616 \div 18 \div 8 = ?$

(a) 36

(b) 76

(c) 49

(d) 39

(e) None of these

9. $22^2 + \sqrt{?} = 516$

(a) 1029

(b) 1024

(c) 1124

(d) 1128

(e) None of these

10. 45% of 660 + 28% of 450 = ?

(a) 413

(b) 428

(c) 423

(d) 418

(e) None of these

DIRECTIONS (Qs. 11-15): What will come in place of the question mark (?) in the following number series.

11. 12 16 24 40 ?

(a) 76

(b) 72

(c) 84

(d) 88

(e) None of these

12. 9 19 39 79 ?
 (a) 139 (b) 129
 (c) 159 (d) 149
 (e) None of these
13. 8 17 42 91 ?
 (a) 170 (b) 142
 (c) 140 (d) 172
 (e) None of these
14. 7 8 18 57 ?
 (a) 244 (b) 174
 (c) 186 (d) 226
 (e) None of these
15. 3840 960 240 60 ?
 (a) 20 (b) 18
 (c) 12 (d) 22
 (e) None of these
16. Simple interest accrued on an amount in 8 years at the rate of 12 p.c.p.a. is ₹ 5,520. What is the principal?
 (a) ₹ 5,750 (b) ₹ 8,500
 (c) ₹ 5,650 (d) ₹ 8,250
 (e) None of these
17. Srikant and Vividh started a business investing amounts of ₹ 1,85,000 and ₹ 2,25,000 respectively, If Vividh's share in the profit earned by them is ₹ 9,000, what is the total profit earned by them together?
 (a) ₹ 17,400 (b) ₹ 16,400
 (c) ₹ 16,800 (d) ₹ 17,800
 (e) None of these
18. Present ages of father and son are in the ratio of 6 : 1 respectively. Four years after the ratio of their ages will become 4 : 1 respectively. What is the son's present age?
 (a) 10 years (b) 6 years
 (c) 4 years (d) 8 years
 (e) None of these
19. A DVD player was purchased for Rs. 4,860. At what price should it be sold so that 25% profit is earned?
 (a) ₹ 6,225 (b) ₹ 6,275
 (c) ₹ 6,075 (d) ₹ 6,025
 (e) None of these
20. 65% of a number is more than its $\frac{2}{5}$ th by 140. What is 30% of that number?
 (a) 186 (b) 168
 (c) 164 (d) 182
 (e) None of these
21. Number obtained by interchanging the digit of a two digit number is more than the original number by 27 and the sum of the digits is 13. What is the original number?
 (a) 58 (b) 67
 (c) 76 (d) 85
 (e) None of these
22. 22 men can complete a job in 16 days. In how many days will 32 men complete that job?
 (a) 14 (b) 12
 (c) 16 (d) 9
 (e) None of these
23. Mr. Davar spends 38% of his monthly income on food, 25% on children's education and 12% on transport and the remaining amount of ₹ 5,800 he saves. What is Mr. Davar's monthly income?
 (a) ₹ 23,200 (b) ₹ 24,200
 (c) ₹ 23,800 (d) ₹ 24,400
 (e) None of these
24. A, B, C, D and E are five consecutive odd numbers. Average of A and C is 59. What is the smallest number?
 (a) 65 (b) 63
 (c) 61 (d) 57
 (e) None of these
25. Out of the fractions $\frac{9}{31}$, $\frac{3}{17}$, $\frac{6}{23}$, $\frac{4}{11}$ and $\frac{7}{25}$, which is the largest fraction?
 (a) $\frac{9}{31}$ (b) $\frac{3}{17}$
 (c) $\frac{6}{23}$ (d) $\frac{4}{11}$
 (e) None of these
26. What will come in place of both the question marks (?) in the following question?
 $\frac{23}{?} = \frac{?}{92}$
 (a) 56 (b) 54
 (c) 44 (d) 46
 (e) None of these
27. The salary of a man increases by 20% every year in the month of January. His salary was ₹ 5,000 in the month of February in year 2009. What will be his salary in the month of February in the year 2011?
 (a) ₹ 7,200 (b) ₹ 6,200
 (c) ₹ 7,800 (d) ₹ 6,800
 (e) None of these
28. The simple interest on a certain principal in 5 years at the rate of 12 p.c. p.a. is ₹ 1,536. What amount of the simple interest would one get if one invests ₹ 1,000 more than the previous principal for 2 years and at the same rate p.c.p.a.?
 (a) ₹ 845.40 (b) ₹ 614.40
 (c) ₹ 2,136 (d) ₹ 1,536
 (e) None of these
29. If 3 men or 9 boys can finish a piece of work in 21 days. In how many days can 5 men and 6 boys together do the same piece of work?
 (a) 12 days (b) 8 days
 (c) 14 days (d) Cannot be determined
 (e) None of these

30. In a test, Rajesh got 112 marks which is 32 more than the passing marks. Sonal got 75% marks which is 70 more than the passing marks. What is the minimum passing percentage of the test?
- (a) 35 (b) 45
(c) 40 (d) 30
(e) None of these

DIRECTIONS (Qs. 31-35): Study the following information carefully and answer the questions given below it.

Out of the 15,000 candidates eligible for an Officer's post in a Public Sector Bank, 450 candidates have prior experience of working in Public Sector banks in rural area only. 25% of the total number of candidates have prior experience of working in Public Sector Banks in urban areas only. 12% of the total number of candidates have prior experience of working in Private Sector Banks in urban areas only. 2% of the total number of candidates have prior experience of working in Private Sector banks in rural areas only. 3,600 candidates have worked in both Public and Private Sector Banks in urban areas only. 600 candidates have worked in both Public and Private Sector Banks in rural areas only. The remaining candidates have no prior experience of working in the Banking industry.

31. How many candidates have prior experience of working in rural areas (both Public Sector and Private Sector Banks together)?
- (a) 4,350 (b) 4,950
(c) 4,800 (d) 4,900
(e) 4,850
32. How many candidates have prior experience of working in Public Sector Banks (Urban and Rural areas together)?
- (a) 12,450 (b) 8,400
(c) 10,050 (d) 10,650
(e) None of these
33. What is the ratio of the candidates who have a prior experience of working in Public Sector Banks in rural areas only to the candidates who have a prior experience of working in Private Sector Banks in rural areas only?
- (a) 4 : 3 (b) 3 : 2
(c) 2 : 3 (d) 3 : 4
(e) None of these
34. What is the total number of candidates who have worked in Private Sector Banks in urban areas?
- (a) 1,800 (b) 2,250
(c) 4,050 (d) 36,600
(e) None of these
35. The candidates who have no prior experience of working in the banking industry are what per cent of the candidates who have worked in Public Sector Banks in both urban and rural areas together?
- (a) 60.5 (b) 63.5
(c) 62 (d) 64
(e) None of these

REASONING ABILITY

36. How many meaningful three letter English words can be formed with the letters AER, using each letter only once in each word?
- (a) None (b) One
(c) Three (d) Two
(e) Four
37. Each vowel of the word ADJECTIVE is substituted with the next letter of the English alphabetical series, and each consonant is substituted with the letter preceding it. How many vowels are present in the new arrangement?
- (a) Four (b) One
(c) Two (d) Three
(e) None of these
38. In a certain code 'na pa ka so' means 'birds fly very high', 'ri so la pa' means 'birds are very beautiful' and 'ti me ka bo' means 'the parrots could fly'. Which of the following is the code for 'high' in that language?
- (a) na (b) ka
(c) bo (d) so
(e) None of these
39. If the digits in the number 86435192 are arranged in ascending order, what will be the difference between the digits which are second from the right and fourth from the left in the new arrangement?
- (a) One (b) Two
(c) Three (d) Four
(e) None
40. If it is possible to make only one meaningful word with the Third, Seventh, Eighth and Tenth letters of the word COMPATIBILITY, which of the following would be the last letter of that word? If no such word can be made, give 'X' as your answer and if more than one such word can be formed, give your answer as 'Y'.
- (a) I (b) B
(c) L (d) X
(e) Y
41. In a certain code FINE is written HGPC. How is SLIT written in that code?
- (a) UTGR (b) UTKR
(c) TUGR (d) RUGT
(e) None of these
42. If in a certain language LATE is coded as 8 & 4 \$ and HIRE is coded as 7*3\$ then how will HAIL be coded in the same language?
- (a) 7 & 8* (b) &7*8
(c) 7*&8 (d) 7&*8
(e) None of these
43. Four of the following five are alike in a certain way and so form a group. Which is the one that does not belong to that group?
- (a) Stem (b) Tree
(c) Root (d) Branch
(e) Leaf

44. If 'Apple' is called 'Orange', 'Orange' is called 'Peach', 'Peach' is called 'Patato', 'Potato' is called 'Banana', 'Banana' is called 'Papaya' and 'Papaya' is called 'Guava', which of the following grows underground ?
- (a) Potato (b) Guava
(c) Apple (d) Banana
(e) None of these
45. How many such pairs of letters are there in word ENGLISH, each of which has as many letters between its two letters as there are between them in the English alphabets ?
- (a) None (b) One
(c) Two (d) Three
(e) More than three

DIRECTIONS (Qs. 46-50) : In each of the questions below are given three statements followed by two conclusions numbered I and II. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. Read both of the conclusions and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

Read the statements and the conclusions which follow it and give answer

- (a) If only conclusion I is true.
(b) If only conclusion II is true.
(c) If either conclusion I or conclusion II is true.
(d) If neither conclusion I nor conclusion II is true.
(e) If both conclusions I and II are true.

46. **Statements :**

All stars are suns.
Some suns are planets.
All planets are satellites.

Conclusions :

- I. Some satellites are stars.
II. No star is a satellite.

47. **Statements :**

All curtains are rods.
Some rods are sheets.
Some sheets are pillows.

Conclusions :

- I. Some pillows are rods.
II. Some rods are curtains.

48. **Statements :**

All switches are plugs.
Some plugs are bulbs.
All bulbs are sockets.

Conclusions :

- I. Some sockets are plugs.
II. Some plugs are switches.

49. **Statements :**

All fishes are birds.
All birds are rats.
All rats are cows.

Conclusions :

- I. All birds are cows.
II. All rats are fishes.

50. **Statements :**

Some walls are windows.
Some windows are doors.
All doors are roofs.

Conclusions :

- I. Some doors are walls.
II. No roof is a window.

DIRECTIONS (Qs. 51-55) : Read the following information carefully and answer the questions, which follow :

'A - B' means 'A is father of B'.

'A + B' means 'A is daughter of B'.

'A ÷ B' means 'A is son of B'.

'A × B' means 'A is wife of B'.

51. How is P related to T in the expression 'P + S - T' ?
- (a) Sister (b) Wife
(c) Son (d) Daughter
(e) None of these
52. In the expression 'P × Q - T' how is T related to P ?
- (a) Daughter (b) Sister
(c) Mother (d) Can't be determined
(e) None of these
53. Which of the following means T is wife of P ?
- (a) $P \times S \div T$ (b) $P \div S \times T$
(c) $P - S \div T$ (d) $P + T \div S$
(e) None of these
54. Which of the following means P is grandson of S ?
- (a) $P + Q - S$ (b) $P \div Q \times S$
(c) $P \div Q + S$ (d) $P \times Q \div S$
(e) None of these
55. In the expression 'P + Q × T' how is T related to P ?
- (a) Mother (b) Father
(c) Son (d) Brother
(e) None of these

DIRECTIONS (Qs. 56-60) : In each question a group of letters is given followed by four combinations of number/symbol numbered (a), (b), (c) and (d). Letters are to be coded as per the scheme and conditions given below. You have to find out the serial number of the combination, which represents the letter group. Serial number of that combination is your answer. If none of the combinations is correct, your answer is (e) i.e. None of these.

Letters	Q	M	S	I	N	G	D	K	A	L	P	R	B	J	E
Number/	7	@	4	#	%	\$	6	1	2	£	5	*	9	8	3
Symbol															

Conditions :

- (i) If the first letter is a consonant and the last a vowel, both are to be coded as the code of the vowel.

- (ii) If the first letter is vowel and the last a consonant, the codes for the first and the last are to be interchanged.
- (iii) If no vowel is present in the group of letters, the second and the fifth letters are to be coded as ©.
56. **BARNIS**
 (a) 9 2 * % # 4 (b) 9 2 4 # * %
 (c) 9 2 * # % 9 (d) 4 2 * # % 4
 (e) None of these
57. **DMBNIA**
 (a) 6 @ 9 % # 2 (b) 2 @ 9 % # 6
 (c) 2 @ 9 % # 6 (d) 2 @ 9 % # 2
 (e) None of these
58. **IJBRLG**
 (a) # 8 9 * £ \$ (b) # 8 9 * £ #
 (c) \$ 8 9 * £ # (d) \$ 8 9 * £ \$
 (e) None of these
59. **BKGQJN**
 (a) 9 © \$ 7 © % (b) © 9 \$ 7 % ©
 (c) 9 1 \$ 7 8 % (d) % 1 \$ 7 8 9
 (e) None of these
60. **EGAKRL**
 (a) # £ \$ 2 1 * (b) £ \$ 2 1 * 3
 (c) £ \$ 2 1 * # (d) # £ \$ 2 1 #
 (e) None of these

DIRECTIONS (Qs. 61-65) : Study the following information carefully to answer these questions.

Eight persons A, B, C, D, E, F, G and H work for three different companies namely X, Y and Z. Not more than three persons work for a company. There are only two ladies in the group who have different specialisations and work for different companies. Of the group of friends, two have specialisation in each HR, Finance and Marketing. One member is an engineer and one is a doctor. H is an HR specialist and works with a Marketing specialist B who does not work for company Y. C is an engineer and his sister works in company Z. D is a specialist in HR working in company X while her friend G is a finance specialist and works for company Z. No two persons having the same specialisation work together. Marketing specialist F work for company Y and his friend A who is a Finance expert works for company X in which only two specialists work. No lady is a marketing specialist or a doctor.

61. Which of the following combinations is correct ?
 (a) C - Z - Engineer (b) E - X - Doctor
 (c) H - X - HR (d) C - Y - Engineer
 (e) None of these
62. For which of the following companies does C work?
 (a) Y (b) X
 (c) Z (d) Data inadequate
 (e) None of these

63. Which of the following pairs represents the two ladies in the group ?
 (a) A and D (b) B and D
 (c) D and G (d) Data inadequate
 (e) None of these
64. Which of the following represents the pair working in the same company ?
 (a) D and C (b) A and B
 (c) A and E (d) H and F
 (e) None of these
65. Who amongst the friends is a doctor ?
 (a) H (b) E
 (c) C (d) Either E or C
 (e) None of these

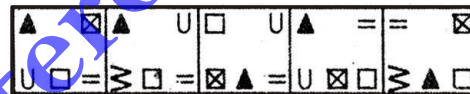
DIRECTIONS (Qs. 66-70) : In each of the questions given below which one of the five answer figures should come after the problem figures if the sequence were continued ?

66. **Problem Figures**



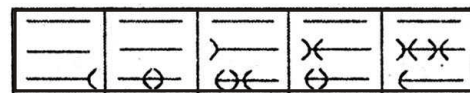
- (a) (b) (c) (d) (e)

Answer Figures



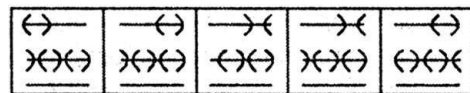
- (a) (b) (c) (d) (e)

67. **Problem Figures**



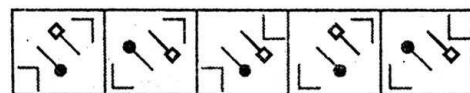
- (a) (b) (c) (d) (e)

Answer Figures



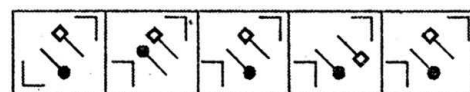
- (a) (b) (c) (d) (e)

68. **Problem Figures**



- (a) (b) (c) (d) (e)

Answer Figures



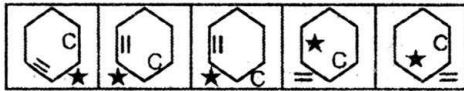
- (a) (b) (c) (d) (e)

69. Problem Figures



(a) (b) (c) (d) (e)

Answer Figures



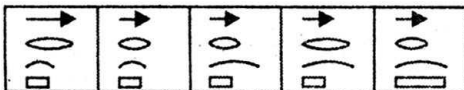
(a) (b) (c) (d) (e)

70. Problem Figures



(a) (b) (c) (d) (e)

Answer Figures



(a) (b) (c) (d) (e)

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-82): Read the following passage carefully and answer the questions given below it. Certain words/phrases are given in **bold** to help you to locate them while answering some of the questions.

In a disarmingly frank talk at the Indian Merchants Chamber in Mumbai, the Japanese Ambassador in India dwelt at length on issues that exercise the minds of Japanese investors when they consider investment proposals in India.

Raising the question "What comparative advantages does India offer as an investment market?", he said though labour in India is expensive, wage-levels are offset by productivity level to a large extent.

Acknowledging that the vastness of the Indian market is a great **inducement** for investment in manufacturing industry, he wondered if it was **justifiable** to provide that overseas remittance of profit in foreign exchange be fully covered by exchange earnings as had been done. Significantly, on the eve of the Prime Minister's visit to Japan, the government delinked profits repatriation from exports, meeting this demand.

The Ambassador said foreign investors needed to be assured of the continuity and consistency of the liberalisation policy and the fact that new measures had been put into force by means of administrative notifications without amending government laws acted as a damper.

The Ambassador pleaded for speedy formulation of the exit policy and pointed to the highly restrictive control by the government on disinvestment by foreign partner in joint ventures in India.

While it is all too easy to dismiss critical comment on conditions in India **contemptuously**, there can be little doubt that if foreign investment is to be wooed **assiduously**, we will have to meet exacting international standards and cater at least partially to what we may consider the **idiosyncrasies** of our foreign collaborators. The Japanese too have passed through a stage in the fifties when their products were derided as sub-standard and **shoddy**. That they have come out of that ordeal of fire to emerge as an economic superpower speaks a much of their doggedness to pursue goals against all odds acceptable standards.

There is no gainsaying that the past record of Japanese investment is a poor benchmark for future expectations.

71. The author has appreciated the Japanese for their
- quality of products manufactured in the fifties.
 - passing through an ordeal.
 - perseverance in raising quality of products.
 - future expectations.
 - None of these
72. According to the Japanese Ambassador, which of the following motivates the foreign investors to invest in Indian manufacturing industry?
- very large scope of Indian market
 - overseas remittance of profit in foreign exchange
 - assurance of continuity of the liberalisation policy
 - high productivity levels
 - None of these
73. The purpose of the author in writing this passage seems to be to
- discourage foreign investment in India.
 - critically examine Indian investment environment.
 - paint a rosy picture of India's trade and commerce.
 - criticize government's liberalization policy.
 - raise the expectations of foreign investors.
74. According to the Japanese Ambassador, India offers a comparative advantage to foreign investors in terms of
- inexpensive labour
 - abysmally low wage levels
 - higher productivity
 - skilled workforce
 - None of these
75. For seeking more and more foreign investment, the author suggests that we should
- satisfy fully the whims of our foreign collaborators.
 - dismiss all critical comments on Indian conditions.
 - link profit repatriations to exports.
 - raise the quality of product to match international standards.
 - None of these
76. From the passage it can be inferred that the author is
- a political commentator.
 - a secretary of the Japanese Ambassador.
 - a Japanese investor.
 - an Indian investor.
 - None of these

77. The author attributes Japan's emergence as an economic superpower to
- their ability to overcome any ordeal.
 - their tenacity and perseverance despite unfavourable circumstances.
 - their ability to improvise and adapt to globally acceptable quality levels.
- A & B only
 - B & C only
 - A & C only
 - All the three
 - None of these
78. Which of the following statement(s) is/are true about the critical comments on investment conditions in India?
- These comments are difficult to be countered.
 - These comments are received from various international quarters.
 - These comments are based more on biases than on facts.
- Only C
 - Only B
 - Only A
 - A & B only
 - A & C only

DIRECTIONS (Qs. 79 & 80): Choose the word which is most nearly the SAME in meaning to the word printed in capital as used in the passage.

79. **ASSIDUOUSLY**
- persistently
 - hastily
 - feebly
 - deliberately
 - innocently
80. **IDIOSYNCRASIES**
- demands
 - needs
 - deviations
 - ideologies
 - identity

DIRECTIONS (Qs. 81 & 82): Choose the word which is most OPPOSITE in meaning of the word printed in capital as used in the passage.

81. **INDUCEMENT**
- incentive
 - motive
 - breach
 - temptation
 - impediment
82. **JUSTIFIABLE**
- unreasonable
 - formidable
 - irrevocable
 - unscrupulous
 - inevitable

DIRECTIONS (Qs. 83-87): Look at the bold part of each sentence. Below each sentence are given four possible substitutions for the underlined part. If one of them (a), (b), (c) or (d) is better than the underlined part, indicate your response on the Answer Sheet against the corresponding letter (a), (b), (c) or (d). If none of the substitutions improves the sentence, indicate (e) as your response on the Answer Sheet. Thus a 'No' improvement'

response will be signified by the letter (e). Errors may be in grammar, appropriate word usage or idioms. There may be a necessary word missing or there may be a word which should be removed.

83. He does not smoke, **nor he drinks.**
- nor he does drink
 - neither he does drink
 - nor does he drink
 - but drinks
 - No improvement
84. The patient **could have been saved** if he had been taken to the hospital in time.
- could be saved
 - could save
 - had been saved
 - can saved
 - No improvement
85. I must speak to the landlord about the people above. They make **much noise.**
- much of noise
 - very much noise
 - too much noise
 - So much noise
 - No improvement
86. When the bomb went off, it broke **all of our windows.**
- all our windows
 - all windows of us
 - our all windows
 - all the window
 - No improvement
87. Knowing very little English, **it was difficult to converse** with the foreigner.
- I found it difficult to converse
 - to converse was difficult
 - conversing was difficult
 - It was not easy to conversed
 - No improvement

DIRECTIONS (Qs. 88-92): In each question below a sentence with four words printed in bold type is given. These are numbered as (a), (b), (c) or (d). One of these four boldly printed words may be either *wrongly spelt* or *inappropriate* in the context of the sentence. Find out the word which is wrongly spelt or inappropriate, if any. The letter of that word is your answer. If all the boldly printed words are correctly spelt and also appropriate in the context of the sentence, mark (e), i.e. 'All correct', as your answer.

88. It is indeed **recommendable** (a) that the apex court has **deemed** (b) it necessary to remind the government of its duties in **promoting** (c) education and **investing** (d) in it. **All correct** (e)
89. The **perception** (a) of animal life was even more **ambiguous** (b) because of **anthropomorphic** (c) **characterisations** (d) of animal behaviour. **All correct** (e).
90. Policy of **permitting** (a) **legal** (b) import of gold has **stimulated** (c) its **consumation** (d). **All correct** (e)
91. His **continually** (a) **defending** (b) his stand on the issue has **risen** (c) **doubts** (d) in the mind of the jury. **All correct** (e).
92. The government's strategy to **encourage** (a) **entrepreneurship** (b) gathers **momentum** (c) with **unenvisaged** (d) response. **All correct** (e).

DIRECTIONS (Qs. 93-100): In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

Trust is the basis of human relationship. As trust between people grows, 93 change and interpersonal dynamics are transformed. Diverse skills and abilities become 94 and appreciated as strengths. People begin to 95 one another's attitudes and feelings. They learn to be 96 instead of playing roles. As trust grows the barriers that prevent 97 and openness lessen. People become more expressive, impulsive, frank and spontaneous. Their communication is efficient and clear. They risk 98 and confrontation, opening the doors to deeper communication, involvement and commitment. Congestion and 99 lessen. The flow of data is open and 100.

93. (a) motivations (b) behaviours
(c) patterns (d) aspirations
(e) commitments

94. (a) obvious (b) necessary
(c) essential (d) recognised
(e) prominent
95. (a) accept (b) participate
(c) pronounce (d) inculcate
(e) relate
96. (a) advocates (b) possessed
(c) exponents (d) indifferent
(e) themselves
97. (a) snobbery (b) egoism
(c) brashness (d) boasting
(e) candour
98. (a) conflict (b) persuasiveness
(c) dedication (d) propensity
(e) jealousy
99. (a) pervasiveness (b) boundaries
(c) sluggishness (d) blocking
(e) enthusiasm
100. (a) unanimous (b) uncritical
(c) uninhabited (d) uncanny
(e) unusual

RESPONSE SHEET

- | | | | | | | | | | |
|-----|---------------------|-----|---------------------|-----|---------------------|-----|---------------------|------|---------------------|
| 1. | (a) (b) (c) (d) (e) | 2. | (a) (b) (c) (d) (e) | 3. | (a) (b) (c) (d) (e) | 4. | (a) (b) (c) (d) (e) | 5. | (a) (b) (c) (d) (e) |
| 6. | (a) (b) (c) (d) (e) | 7. | (a) (b) (c) (d) (e) | 8. | (a) (b) (c) (d) (e) | 9. | (a) (b) (c) (d) (e) | 10. | (a) (b) (c) (d) (e) |
| 11. | (a) (b) (c) (d) (e) | 12. | (a) (b) (c) (d) (e) | 13. | (a) (b) (c) (d) (e) | 14. | (a) (b) (c) (d) (e) | 15. | (a) (b) (c) (d) (e) |
| 16. | (a) (b) (c) (d) (e) | 17. | (a) (b) (c) (d) (e) | 18. | (a) (b) (c) (d) (e) | 19. | (a) (b) (c) (d) (e) | 20. | (a) (b) (c) (d) (e) |
| 21. | (a) (b) (c) (d) (e) | 22. | (a) (b) (c) (d) (e) | 23. | (a) (b) (c) (d) (e) | 24. | (a) (b) (c) (d) (e) | 25. | (a) (b) (c) (d) (e) |
| 26. | (a) (b) (c) (d) (e) | 27. | (a) (b) (c) (d) (e) | 28. | (a) (b) (c) (d) (e) | 29. | (a) (b) (c) (d) (e) | 30. | (a) (b) (c) (d) (e) |
| 31. | (a) (b) (c) (d) (e) | 32. | (a) (b) (c) (d) (e) | 33. | (a) (b) (c) (d) (e) | 34. | (a) (b) (c) (d) (e) | 35. | (a) (b) (c) (d) (e) |
| 36. | (a) (b) (c) (d) (e) | 37. | (a) (b) (c) (d) (e) | 38. | (a) (b) (c) (d) (e) | 39. | (a) (b) (c) (d) (e) | 40. | (a) (b) (c) (d) (e) |
| 41. | (a) (b) (c) (d) (e) | 42. | (a) (b) (c) (d) (e) | 43. | (a) (b) (c) (d) (e) | 44. | (a) (b) (c) (d) (e) | 45. | (a) (b) (c) (d) (e) |
| 46. | (a) (b) (c) (d) (e) | 47. | (a) (b) (c) (d) (e) | 48. | (a) (b) (c) (d) (e) | 49. | (a) (b) (c) (d) (e) | 50. | (a) (b) (c) (d) (e) |
| 51. | (a) (b) (c) (d) (e) | 52. | (a) (b) (c) (d) (e) | 53. | (a) (b) (c) (d) (e) | 54. | (a) (b) (c) (d) (e) | 55. | (a) (b) (c) (d) (e) |
| 56. | (a) (b) (c) (d) (e) | 57. | (a) (b) (c) (d) (e) | 58. | (a) (b) (c) (d) (e) | 59. | (a) (b) (c) (d) (e) | 60. | (a) (b) (c) (d) (e) |
| 61. | (a) (b) (c) (d) (e) | 62. | (a) (b) (c) (d) (e) | 63. | (a) (b) (c) (d) (e) | 64. | (a) (b) (c) (d) (e) | 65. | (a) (b) (c) (d) (e) |
| 66. | (a) (b) (c) (d) (e) | 67. | (a) (b) (c) (d) (e) | 68. | (a) (b) (c) (d) (e) | 69. | (a) (b) (c) (d) (e) | 70. | (a) (b) (c) (d) (e) |
| 71. | (a) (b) (c) (d) (e) | 72. | (a) (b) (c) (d) (e) | 73. | (a) (b) (c) (d) (e) | 74. | (a) (b) (c) (d) (e) | 75. | (a) (b) (c) (d) (e) |
| 76. | (a) (b) (c) (d) (e) | 77. | (a) (b) (c) (d) (e) | 78. | (a) (b) (c) (d) (e) | 79. | (a) (b) (c) (d) (e) | 80. | (a) (b) (c) (d) (e) |
| 81. | (a) (b) (c) (d) (e) | 82. | (a) (b) (c) (d) (e) | 83. | (a) (b) (c) (d) (e) | 84. | (a) (b) (c) (d) (e) | 85. | (a) (b) (c) (d) (e) |
| 86. | (a) (b) (c) (d) (e) | 87. | (a) (b) (c) (d) (e) | 88. | (a) (b) (c) (d) (e) | 89. | (a) (b) (c) (d) (e) | 90. | (a) (b) (c) (d) (e) |
| 91. | (a) (b) (c) (d) (e) | 92. | (a) (b) (c) (d) (e) | 93. | (a) (b) (c) (d) (e) | 94. | (a) (b) (c) (d) (e) | 95. | (a) (b) (c) (d) (e) |
| 96. | (a) (b) (c) (d) (e) | 97. | (a) (b) (c) (d) (e) | 98. | (a) (b) (c) (d) (e) | 99. | (a) (b) (c) (d) (e) | 100. | (a) (b) (c) (d) (e) |

Answer Key

1	(d)	11	(b)	21	(a)	31	(b)	41	(e)	51	(a)	61	(d)	71	(c)	81	(e)	91	(c)
2	(a)	12	(c)	22	(e)	32	(d)	42	(d)	52	(d)	62	(a)	72	(a)	82	(d)	92	(b)
3	(c)	13	(d)	23	(a)	33	(b)	43	(b)	53	(e)	63	(c)	73	(b)	83	(c)	93	(b)
4	(a)	14	(e)	24	(d)	34	(c)	44	(d)	54	(c)	64	(e)	74	(e)	84	(e)	94	(e)
5	(e)	15	(e)	25	(d)	35	(e)	45	(e)	55	(b)	65	(b)	75	(d)	85	(c)	95	(a)
6	(c)	16	(a)	26	(d)	36	(c)	46	(c)	56	(a)	66	(a)	76	(a)	86	(a)	96	(e)
7	(b)	17	(b)	27	(a)	37	(c)	47	(b)	57	(d)	67	(d)	77	(d)	87	(e)	97	(e)
8	(d)	18	(b)	28	(e)	38	(a)	48	(e)	58	(c)	68	(c)	78	(b)	88	(d)	98	(a)
9	(b)	19	(c)	29	(e)	39	(d)	49	(a)	59	(a)	69	(d)	79	(d)	89	(b)	99	(d)
10	(c)	20	(b)	30	(c)	40	(b)	50	(d)	60	(b)	70	(e)	80	(d)	90	(d)	100	(b)

Answers & Explanations

1. (d) $? = 848 \times \frac{11}{16} \times \frac{4}{5} \times \frac{5}{11} = 212$

2. (a) $? = \frac{150 \times 1.4}{100} + \frac{480 \times 2.2}{100}$
 $= 10.50 + 10.56 = 21.06$

3. (c) $? = \frac{116 \times 3}{4} - \frac{87 \times 2}{3}$
 $= 87 - 58 = 29$

4. (a) $? = \frac{6.96}{1.2} - \frac{18.24}{7.6}$
 $= 5.8 - 2.4 = 3.4$

5. (e) $\frac{250 \times 136}{100} + \frac{550 \times ?}{100} = 670$
 $\Rightarrow 340 + 5.5 \times ? = 670$
 $\Rightarrow 5.5 \times ? = 670 - 340 = 330$
 $\Rightarrow ? = \frac{330}{5.5} = 60$

6. (c) $? = \frac{14 \times 25 - 125}{120 + 72} = \frac{225}{192}$
 $= \frac{75}{64} = 1\frac{11}{64}$

7. (b) $\frac{87}{5} \times \frac{37}{8} - ? = \frac{375}{8}$
 $\Rightarrow ? = \frac{3219}{40} - \frac{375}{8}$
 $= \frac{3219 - 1875}{40} = \frac{1344}{40}$
 $= \frac{168}{5} = 33\frac{3}{5}$

8. (d) $? = \frac{5616}{18 \times 8} = 39$

9. (b) $484 + \sqrt{?} = 516$
 $\Rightarrow \sqrt{?} = 516 - 484 = 32$
 $\therefore ? = 32 \times 32 = 1024$

10. (c) $? = \frac{660 \times 45}{100} + \frac{450 \times 28}{100}$
 $= 297 + 126 = 423$

11. (b) The pattern of the number series is:
 $12 + 2^2 = 16$
 $16 + 2^3 = 24$
 $24 + 2^4 = 40$
 $40 + 2^5 = \boxed{72}$

12. (c) The pattern of the number series is :
 $9 + 10 = 19$
 $19 + 20 = 39$
 $39 + 40 = 79$
 $79 + 80 = \boxed{159}$

13. (d) The pattern of the number series is:
 $8 + 3^2 = 17$
 $17 + 5^2 = 42$
 $42 + 7^2 = 91$
 $91 + 9^2 = \boxed{172}$

14. (e) The pattern of the number series is:
 $7 \times 1 + 1 = 8$
 $8 \times 2 + 2 = 18$
 $18 \times 3 + 3 = 57$
 $57 \times 4 + 4 = \boxed{232}$

15. (e) The pattern of the number series is:
 $3840 \div 4 = 960$
 $960 \div 4 = 240$
 $240 \div 4 = 60$
 $60 \div 4 = \boxed{15}$

$$16. (a) \text{ Principal} = \frac{\text{SI} \times 100}{\text{Time} \times \text{Rate}} = \frac{5520 \times 100}{8 \times 12} = ₹ 5750$$

$$17. (b) \text{ Ratio of the profit of Srikant and Vividh} \\ = 185000 : 225000 = 37 : 45 \\ \text{Sum of the ratios} = 37 + 45 = 82$$

∴ Total profit earned

$$= \frac{82}{45} \times 9000 \\ = ₹ 16400$$

$$18. (b) \text{ Father's present age} = 6x \text{ years} \\ \text{Son's present age} = x \text{ years} \\ \text{After four years}$$

$$\therefore \frac{6x+4}{x+4} = \frac{4}{1}$$

$$\Rightarrow 6x+4 = 4x+16$$

$$\Rightarrow 2x = 12 \Rightarrow x = \frac{12}{2} = 6$$

∴ Son's present age = 6 years

$$19. (c) \text{ SP} = \frac{100 \times \text{Profit}\%}{100} \times \text{CP}$$

$$= ₹ \left(4860 \times \frac{125}{100} \right) = ₹ 6075$$

$$20. (b) \text{ Let the number be } x.$$

$$\therefore \frac{x \times 65}{100} - \frac{2x}{5} = 140 \Rightarrow \frac{13x}{20} - \frac{2x}{5} = 140$$

$$\Rightarrow \frac{13x - 8x}{20} = 140 \Rightarrow \frac{x}{4} = 140$$

$$\Rightarrow x = 4 \times 140 = 560$$

$$\therefore 30\% \text{ of } 560 = \frac{560 \times 30}{100} = 168$$

$$21. (a) \text{ Let the original number be } 10x + y \text{ where } y > x.$$

$$\therefore 10y + x - 10x - y = 27$$

$$\Rightarrow 9(y - x) = 27$$

$$\Rightarrow y - x = 3 \quad \dots(i)$$

$$\text{and } x + y = 13 \quad \dots(ii)$$

From equations (i) and (ii),

$$y = 8 \text{ and } x = 5$$

∴ Original number = 58

$$22. (e) M_1 D_1 = M_2 D_2$$

$$\Rightarrow 22 \times 16 = 32 \times D_2$$

$$\Rightarrow D_2 = \frac{22 \times 16}{32} = 11 \text{ days}$$

$$23. (a) \text{ Davar's total expenditure percentage}$$

$$= (38 + 25 + 12)\% = 75\%$$

$$\text{Savings percentage} = 25\%$$

If this monthly salary be ₹ x, then

$$\frac{x \times 25}{100} = 5820$$

$$\Rightarrow x = ₹ (4 \times 5800) = ₹ 23200$$

$$24. (d) \text{ Let the smallest odd number A be } x \\ x + x + 4 = 2 \times 59$$

$$\Rightarrow 2x = 118 - 4 = 114$$

$$\therefore x = \frac{114}{2} = 57$$

$$25. (d) \text{ Decimal equivalent of each fraction :}$$

$$\frac{9}{31} = 0.29; \frac{3}{17} = 0.18$$

$$\frac{6}{23} = 0.26; \frac{4}{11} = 0.36; \frac{7}{25} = 0.28$$

$$\therefore \text{The largest fraction} = \frac{4}{11}$$

$$26. (d) \frac{23}{?} = \frac{?}{92}$$

$$\Rightarrow ? = 23 \times 92$$

$$\Rightarrow ? = \sqrt{23 \times 23 \times 4}$$

$$= 2 \times 23 = 46$$

$$27. (a) \text{ Tricky Approach}$$

Man's salary in the month of February, 2011

$$= 5000 \left(1 + \frac{20}{100} \right)^2 = 5000 \times \frac{6}{5} \times \frac{6}{5}$$

$$= ₹ 7200$$

$$28. (e) \text{ Case I}$$

$$\text{Principal} = \frac{\text{S.I.}}{\text{Time} \times \text{Rate}}$$

$$= \frac{1536 \times 100}{5 \times 12} = ₹ 2560$$

Case II

$$\text{S.I.} = \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$$

$$= \frac{3560 \times 2 \times 12}{100} = ₹ 854.40$$

$$29. (e) \therefore 3 \text{ men} \equiv 9 \text{ boys}$$

$$\therefore 1 \text{ man} \equiv 3 \text{ boys}$$

$$\therefore 5 \text{ man} + 6 \text{ boys}$$

$$\therefore (5 \times 3 + 6) \text{ boys} = 21 \text{ boys}$$

$$\therefore M_1 D_1 = M_2 D_2$$

$$\Rightarrow D_2 = \frac{9 \times 21}{21} = 9 \text{ days}$$

$$30. (c) \text{ Let the total marks of the exam be } x.$$

$$\text{Passing marks} = 112 - 32 = 80$$

$$\therefore \frac{x \times 75}{100} = 80 + 70 = 150$$

$$\Rightarrow x = \frac{150 \times 100}{75} = 200$$

If the minimum Pass percentage is y, then

$$\therefore y\% \text{ of } 200 = 80 \Rightarrow y = 40$$

(31-35): Distribution of officers in different categories is as follow:

Pub.	Pub.	Pri.	Pri.	Pub.
R_u	U_r	R_u	U_r	$(R_u + U_r)$
450	3750	300	1800	3600

Pub. + Pri (R_u)	Pub. + Pri (U_r)
600	2250

32. (d) Total number of candidates.
 $= 450 + 3750 + 3600 + 600 + 2250 = 10650$

33. (b) Reqd ratio $\frac{450}{300} = \frac{3}{2} = 3 : 2$

Required ratio = $300 + 450 = 2 : 3$

34. (c) Required number of candidates working in Private Sector Banks in Urban Areas only
 $= 1800 + 2250 = 4050$

35. (e) Number of candidate having no prior experience of working in banking sector
 $= 15000 - (450 + 3750 + 300 + 1800 + 3600 + 600 + 2250)$
 $= 15000 - 12750 = 2250$

Req. % = $\frac{2250}{15000} \times 100 = 15\%$

36. (c) Meaningful words : ARE, EAR, ERA

37. (c) $A \quad D \quad J \quad E \quad C \quad T \quad I \quad V \quad E$
 $+1 \downarrow -1 \downarrow -1 \downarrow +1 \downarrow -1 \downarrow -1 \downarrow +1 \downarrow -1 \downarrow +1 \downarrow$
 $B \quad C \quad I \quad F \quad B \quad S \quad J \quad U \quad F$

38. (a) $na \underline{pa} \underline{ka} \underline{so} \rightarrow$ birds fly very high
 $ri \underline{so} \underline{la} \underline{pa} \rightarrow$ birds are very beautiful
 $ti \underline{me} \underline{ka} \underline{bo} \rightarrow$ the parrots could fly
 Thus *high* is coded as *na*.

39. (d) 1 2 3 4 5 6 7 8 9
 Difference = $8 - 4 = 4$

40. (b) 1 2 3 4 5 6 7 8 9 10 11 12 13
 C O M P A T I B I L I T Y
 Meaningful word \Rightarrow LIM **B**

41. (e) As $F \xrightarrow{+2} H$ $I \xrightarrow{-2} G$
 $N \xrightarrow{+2} P$ $E \xrightarrow{-2} C$
 Similarly,
 $S \xrightarrow{+2} U$ $L \xrightarrow{-2} J$
 $I \xrightarrow{+2} K$ $T \xrightarrow{-2} R$

42. (d) As $L \rightarrow 8$ and $H \rightarrow 7$
 $A \rightarrow \&$ $I \rightarrow *$
 $T \rightarrow 4$ $R \rightarrow 3$
 $E \rightarrow \$$ $E \rightarrow \$$

Similarly,

$H \rightarrow 7$ $A \rightarrow \&$
 $I \rightarrow *$ $L \rightarrow 8$

43. (b) Others related to 'parts of tree'.
 44. (d) Since 'Potato' is called Banana. Thus, 'Banana' grows underground.
 45. (e) EI, EG, GI and NL.
 46. (c) Some suns are planets.



All planets are satellites.

(I + A \Rightarrow I-type)

"Some suns are satellites".

Conclusions I and II form Complementary Pair.

Therefore, either I or II follows.

47. (b) All curtains are rods.

Some rods are sheets.

(A + I \Rightarrow No Conclusion)

48. (e) Some plugs are bulbs

All bulbs are sockets.

(I + A \Rightarrow I-type)

"Some plugs are sockets".

Conclusion I is Converse of the 3rd Conclusion.

Conclusion II is Converse of the first Premise.

49. (a) All fishes are birds. (conversion)

All birds are rats.

(A + A \Rightarrow A-type)

"All fishes are rats".

All birds are rats. (conversion)

All rats are cows.

(A + A \Rightarrow A-type)

"All birds are cows".

This is Conclusion I.

50. (d) Some windows are doors.

All doors are roofs.

(I + A \Rightarrow I-type)

"Some windows are roofs".

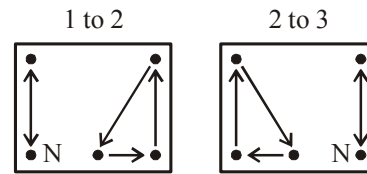
51. (a) $P + S \rightarrow P$ is daughter of S.
 $S - T \rightarrow S$ is father of T.
 Therefore, P is sister of T.
52. (d) $P \times Q \rightarrow P$ is wife of Q.
 $Q - T \rightarrow Q$ is father of T.
 T is child of P and Q.
 The gender of T is not known.
 T is either son or daughter of P.
53. (e) $P \times S \rightarrow P$ is wife of S.
 $S \div T \rightarrow S$ is son of T.
 T is either father-in-law or mother-in-law of P.
 $P \div S \rightarrow P$ is son of S.
 $S \times T \rightarrow S$ is daughter of T.
 Therefore, T is father of P.
 $P - S \rightarrow P$ is father of T.
 $P + T \rightarrow P$ is daughter of T.
 $T \div S \rightarrow T$ is son of S.
 Therefore, T is father of P.
54. (c) $P + Q \rightarrow P$ is daughter of Q.
 $Q - S \rightarrow Q$ is father of S.
 Therefore, P is sister of S.
 $P \div Q \rightarrow P$ is son of Q.
 $Q \times S \rightarrow Q$ is wife of S.
 Therefore, P is son of S.
 $P \div Q \rightarrow P$ is son of Q.
 $Q + S \rightarrow Q$ is daughter of S.
 Therefore, P is grandson of S.
55. (b) $P + Q \rightarrow P$ is daughter of Q.
 $Q \times T \rightarrow Q$ is wife of P.
 Therefore, T is father of P.
56. (a) $B \rightarrow 9$; $A \rightarrow 2$; $R \rightarrow *$; $N \rightarrow \%$; $I \rightarrow \#$; $S \rightarrow 4$
57. (d) $D \rightarrow 2$; $M \rightarrow @$; $B \rightarrow 9$; $N \rightarrow \%$; $I \rightarrow \#$; $A \rightarrow 6$
 Condition (i) is applied.
58. (c) $I \rightarrow \$$; $J \rightarrow 8$; $B \rightarrow 9$; $R \rightarrow *$; $L \rightarrow \text{f}$; $G \rightarrow \#$
 Condition (ii) is applied.
59. (a) $B \rightarrow 9$; $K \rightarrow \text{c}$; $G \rightarrow \$$; $Q \rightarrow 7$; $J \rightarrow \text{c}$; $N \rightarrow \%$
 Condition (iii) is applied.
60. (b) $E \rightarrow \text{f}$; $G \rightarrow \$$; $A \rightarrow 2$; $K \rightarrow \text{f}$; $R \rightarrow *$; $L \rightarrow 3$
 Condition (ii) is applied.

For (Qs. 61-65): Given information can be tabulated as follows

Person	Sex	Company	Specialisation
A	Male	X	Finance
B	Male	Z	Marketing
C	Male	Y	Engineer
D	Female	X	HR
E	Male	Y	Doctor
F	Male	Y	Marketing
G	Female	Z	Finance
H	Male	Z	HR

Thus, 'G' is a sister of 'C'.

66. (a) The movement and other changes in designs can be shown as :



These two steps are repeated alternately.

67. (d) In the subsequent figures respectively one, two zero..... curve(s) is/are added and curves move along the line segment and get reversed in each subsequent figure.
68. (c) In the subsequent figures one design is left intact while other three designs are inverted.
69. (d) In the subsequent figures the star moves three steps in clockwise direction inside the hexagon after every two figures. The equal sign moves respectively one and two step(s) in clockwise direction along the sides of the hexagon. The design C moves in and out the hexagon in the subsequent figures and moves respectively two and one step(s) in clockwise direction. In other words, this problem is based on the rule (1) = (5) and hence (2) = (6).
70. (e) In the subsequent figures respectively two and three designs change size alternately in a set order.
71. (c) The meaning is implied in the last sentence.
72. (a) The Japanese ambassador acknowledges that the vastness of the Indian market is a great inducement for investment in the manufacturing industry.
73. (b) The author describes the Indian investment scenario in toto. He presents a comparative analysis regarding foreign investment in India.
74. (e) Comparatively though labour is inexpensive in India, but at the same time productivity is not high. Therefore, it cannot be cited as an advantage here.
75. (d) If foreign investment is to be wooed assiduously, we will have to meet exacting international standards.
76. (a) The author is a political commentator because he talks about the government policy and makes various proposals regarding foreign investment in India.
78. (b) The passage reflects the views of the Japanese ambassador who also talks about the problems faced by foreign investors in India.
89. (b) The right spelling – ambiguous
90. (d) The right word – consumption
91. (c) It should be 'raised' in place of 'risen'
92. (b) The right spelling – entrepreneurship

8

PRACTICE SET

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $\frac{1}{4}$ th of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-10): What will come in place of question mark (?) in the following questions?

- $\frac{3}{5}$ of $\frac{4}{7}$ of $\frac{5}{12}$ of 1015 = ?
 (a) 220 (b) 340
 (c) 240 (d) 145
 (e) None of these
- $1.5 \times 0.025 + (?)^2 = 0.1$
 (a) 0.28 (b) 0.27
 (c) 0.25 (d) 0.235
 (e) None of these
- $1.5^2 \times \sqrt{0.0225} = ?$
 (a) 0.3375 (b) 3.275
 (c) 32.75 (d) 0.0375
 (e) None of these
- $\sqrt{0.0289} \times 12 \div 1.5 = ?$
 (a) 1.36 (b) 2.06
 (c) 13.90 (d) 14.80
 (e) None of these
- $125\% \text{ of } 260 + \% \text{ of } 700 = 500$
 (a) 32 (b) 56
 (c) 23 (d) 46
 (e) None of these
- $45\% \text{ of } 750 - 25\% \text{ of } 480 = ?$
 (a) 216 (b) 217.50
 (c) 245 (d) 236.50
 (e) None of these
- $75^{8.5} \div 75^{3.8} = 75^?$
 (a) 4.9 (b) 3.6
 (c) 3.3 (d) 4.7
 (e) None of these
- $5431 + 10500 - 4371 - 1357 = ?$
 (a) 9203 (b) 10003
 (c) 10203 (d) 11203
 (e) None of these
- $3\frac{7}{11} + 7\frac{3}{11} \times 1\frac{1}{2} = ?$
 (a) $13\frac{10}{11}$ (b) $14\frac{6}{11}$
 (c) $14\frac{9}{11}$ (d) $10\frac{17}{22}$
 (e) None of these
- $1080 \div 12 \div 10 = ?$
 (a) 900 (b) 90
 (c) 120 (d) 12
 (e) None of these
- The number zero (0) is surrounded by the same 2-digit number on both (left and right) the sides; for example, 25025, 67067, etc. The largest number that always divides such a number is
 (a) 7 (b) 11
 (c) 13 (d) 1001
 (e) None of these
- If a certain sum of money becomes double at simple interest in 12 years, what would be the rate of interest per annum?
 (a) $8\frac{1}{3}$ (b) 10
 (c) $12\frac{2}{3}$ (d) 14
 (e) None of these

13. Three successive discounts of 10%, 12% and 15% amount to a single discount of
 (a) 36.28% (b) 34.68%
 (c) 37% (d) 32.68%
 (e) None of these
14. The ratio of the prices of two houses A and B was 4 : 5 last year. This year, the price of A is increased by 25% and that of B by ₹ 50000. If their prices are now in the ratio 9 : 10, the price of A last year was
 (a) ₹ 3,60,000 (b) ₹ 4,50,000
 (c) ₹ 4,80,000 (d) ₹ 5,00,000
 (e) None of these
15. The number of 3-digit number exactly divisible by 5 is
 (a) 181 (b) 180
 (c) 179 (d) 199
 (e) None of these

DIRECTIONS (Qs. 16-20) : Find the *next term* in the given series in each of the questions below.

16. 198, 194, 185, 169, (?)
 (a) 136 (b) 144
 (c) 9 (d) 92
 (e) None of these
17. 6, 9, 7, 10, 8, 11, (?)
 (a) 12 (b) 13
 (c) 9 (d) 14
 (e) None of these
18. 7, 11, 19, 35, 67, (?)
 (a) 121 (b) 153
 (c) 141 (d) 133
 (e) None of these
19. 5, 6, 10, 19, 35, (?)
 (a) 55 (b) 65
 (c) 60 (d) 70
 (e) None of these
20. 1, 3, 8, 18, 35, (?)
 (a) 61 (b) 72
 (c) 67 (d) 52
 (e) 71

DIRECTIONS (Qs. 21 - 25) : In each of these questions an equation is given with a question mark (?) in place of a correct symbol. Based on the values on the right hand side and the left hand side of the question mark, you have to decide which of the following symbols will correct in place of the question mark.

Give answer If in place of question mark (?) following will come

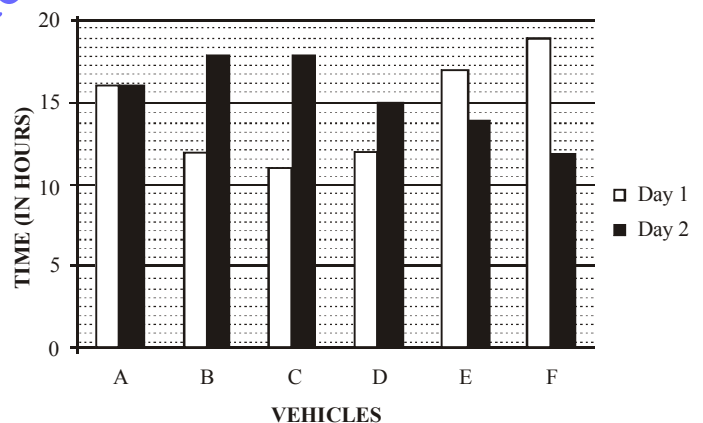
- (a) > (greater than)
 (b) = (equal to)
 (c) < (lesser than)
 (d) ≥ (either greater than or equal to)
 (e) ≤ (either lesser than or equal to)
21. $[(7 \times 3) + 12] ? [\sqrt{225} + 15]$
22. $[(\sqrt{324} - \sqrt{49})] ? (\sqrt{121})$
23. $[(34 - (2)^2 \times 5)] ? [42 \times 8 + (4 \times 4)]$
24. $[133 - (88 - 72)] ? [(7)_2 \times 3]$
25. $21 \div 3 + (54 \div 9) ? [(160 - 60) \div 4]$

DIRECTIONS (Qs. 26-30): Find out the *approximate* value which should replace the question mark (?) in the following questions. (You are not expected to find out the exact value).

26. $|\sqrt{10609}| \times |\sqrt{7938.81}| = ?$
 (a) 9200 (b) 81973.
 (c) 8553.3 (d) 8682.7
 (e) None of these
27. $\left[\left[(13)^2 \right]^3 \right]^2 = 2197$
 (a) -3 (b) $\frac{1}{3}$
 (c) 0.5 (d) -4
 (e) None of these
28. $18.4\% \text{ of } 656 + 12.7\% \text{ of } 864 = ?$
 (a) 253 (b) 231
 (c) 211 (d) 241
 (e) None of these
29. $(98.4)^2 + (33.6)^2 = ?$
 (a) 10812 (b) 18012
 (c) 10910 (d) 18102
 (e) None of these
30. $8787 \div 343 \times \sqrt{50} = ?$
 (a) 250 (b) 140
 (c) 180 (d) 100
 (e) 280

DIRECTIONS (Qs. 31-35) : Study the following graph and table carefully and answer the questions given below :

TIME TAKEN TO TRAVEL (IN HOURS) BY SIX VEHICLES ON TWO DIFFERENT DAYS



DISTANCE COVERED (IN KILOMETERS) BY SIX VEHICLES ON EACH DAY

Vehicle	Day 1	Day 2
A	832	864
B	516	774
C	693	810
D	552	765
E	935	546
F	703	636

31. Which of the following vehicles travelled at the same speed on both the days ?
 (a) Vehicle A (b) Vehicle C
 (c) Vehicle F (d) Vehicle B
 (e) None of these
32. What was the difference between the speed of vehicle A on day 1 and the speed of vehicle C on the same day ?
 (a) 7 km/hr. (b) 12 km/hr.
 (c) 11 km/hr. (d) 8 km/hr.
 (e) None of these
33. What was the speed of vehicle C on day 2 in terms of meters per second ?
 (a) 15.3 (b) 12.8
 (c) 11.5 (d) 13.8
 (e) None of these
34. The distance travelled by vehicle F on day 2 was approximately what percent of the distance travelled by it on day 1 ?
 (a) 80 (b) 65
 (c) 85 (d) 95
 (e) 90
35. What is the respective ratio between the speeds of vehicle D and vehicle E on day 2 ?
 (a) 15:13 (b) 17:13
 (c) 13:11 (d) 17:14
 (e) None of these
38. **Statements :** $J \delta H, H @ B, B \% N$
Conclusions :
 I. $N \delta H$ II. $N @ J$
 III. $J \delta B$
 (a) I and II are true (b) II and III are true
 (c) I and III are true (d) All I, II and III are true
 (e) None of the above
39. **Statements :** $B \# T, T \odot K, K \% M$
Conclusions :
 I. $K \# B$
 II. $M \# T$
 III. $B \# M$
 (a) Only I is true
 (b) Only II is true
 (c) Only III is true
 (d) II and III are true
 (e) None of the above
40. **Statements :** $D \% F, F \delta K, K @ R$
Conclusions :
 I. $R \% F$
 II. $R \% D$
 III. $R @ D$
 (a) Only I is true (b) Only II is true
 (c) Only III is true (d) I and II are true
 (e) None of the above

REASONING ABILITY

DIRECTIONS (Q. 36-40) : In the following questions, the symbols #, %, @, \odot and δ are used with the following meanings illustrated.

'P % Q' means 'P is not greater than Q'.

'P δ Q' means 'P is not smaller than Q'.

'P # Q' means 'P is neither equal to nor smaller than Q'.

'P \odot Q' means 'P is neither equal to nor greater than Q'.

'P @ Q' means 'P is neither smaller than nor greater than Q'.

In each question, three statements showing relationships have been given, which are followed by three conclusions I, II and III. Assuming that the given statements are true, find out which conclusion(s) is/are **definitely true**.

36. **Statements :** $M \odot K, K \delta T, T \odot J$

Conclusions :

I. $J \# K$ II. $T \# M$

III. $M \# J$

(a) None is true (b) Only I is true

(c) Only II is true (d) Only III is true

(e) II and III are true

37. **Statements :** $F @ T, T \% M, M \# R$

Conclusions :

I. $R \odot T$ II. $F @ M$

III. $F \odot M$

(a) Only I is true (b) Only II is true

(c) Only III is true (d) either II or III is true

(e) II and III are true

DIRECTIONS (Q. 41-45) : Study the following arrangement carefully and answer the questions given below

D 5 δ R @ A K \odot 3 9 B J E F \$ M P I 4 H 1 W
 6 2 # U Q 8 T N

41. How many such numbers are there in the above arrangement each of which is immediately preceded by a symbol and immediately followed by a letter?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
42. Which of the following is the ninth to the right of the twenty second from the right end of the above arrangement ?
 (a) E (b) I
 (c) D (d) N
 (e) None of these
43. How many such symbols are there in the above arrangement each of which is immediately preceded by a number and immediately followed by a letter?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
44. If all the numbers are dropped from the above arrangement, which of the following will be the eleventh from the left end?
 (a) B (b) H
 (c) \$ (d)
 (e) None of these

45. How many such consonants are there in the above arrangement each of which is immediately preceded by a number and immediately followed by another consonant ?
- (a) None (b) One
(c) Two (d) Three
(e) More than three

DIRECTIONS (Q. 46-50) : Study the following arrangement carefully and answer the questions given below

M, D, K, R, T, H, W and A are sitting around a circle facing at the centre. D is second to the right of M who is fifth to the left of T. K is third to the right of R who is second to the right of D. H is second to the right of W.

46. Who is second to the right of A ?
- (a) M (b) D
(c) K (d) Data inadequate
(e) None of the above
47. Who is third to the left of M ?
- (a) A (b) T
(c) H (d) D
(e) Data inadequate
48. Who is fourth to the right of H ?
- (a) A (b) T
(c) R (d) K
(e) None of these
49. In which of the following combinations is the first person sitting between the second and the third person ?
- (a) KMW
(b) MWD
(c) RHT
(d) TAK
(e) None of the above
50. If A and W interchange their positions who will be third to the left of R ?
- (a) M (b) D
(c) A (d) K
(e) None of these

DIRECTIONS (Q. 51-55) : In each question below are three statements followed by three conclusions numbered I, II and III. You have to take the three given statements to be true even if they seem to be at variance from commonly known facts and then decide which of the given conclusions logically follows from the three given statements disregarding commonly known facts. Then decide which of the answers (a), (b), (c), (d) and (e) is the correct answer and indicate it on the answer sheet.

51. **Statements :** Some desks are chairs. All chairs are tables. Some tables are mats.
- Conclusions :** I. Some mats are desks.
II. Some tables are desks.
III. Some mats are chairs.
- (a) Only I follows (b) Only II follows
(c) Only III follows (d) II and III follow
(e) None of the above

52. **Statements :** All sweets are fruits. No fruit is pencil. Some pencils are glasses.

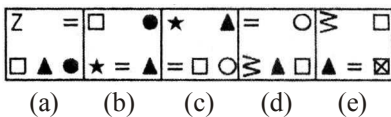
Conclusions : I. Some glasses are sweets.
II. Some pencils are sweets.
III. No glass is sweet.

- (a) Only I follows (b) Only II follows
(c) Only III follows (d) either I or III follows
(e) None of the above
53. **Statements :** Some books are flowers. Some flowers are chains. Some chains are hammers.
- Conclusions :** I. Some hammers are flowers.
II. Some chairs are books.
III. Some hammers are books.
- (a) None follows (b) Only I follows
(c) Only II follows (d) Only III follows
(e) II and III follow
54. **Statements :** All roofs are cameras. Some cameras are photographs. Some photographs are stores.
- Conclusions :** I. Some stores are cameras.
II. Some stores are roofs.
III. Some cameras are roofs.
- (a) Only I follows (b) Only II follows
(c) Only III follows (d) II and III follow
(e) None of the above
55. **Statements :** Some nails are horses. All horses are tablets. All tablets are crows.
- Conclusions :** I. Some crows are nails.
II. Some tablets are nails.
III. Some crows are horses.
- (a) Only I follows (b) I and II follows
(c) I and III follow (d) II and III follow
(e) All I, II and III follow
56. How many meaningful English words can be made with the letters ATLE using each letter only once in each word ?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
57. In a certain code GROWN is written as 7 @ % 36 and NAME is written as 64 \$. How is GEAR written in that code?
- (a) 74\$@ (b) 7\$4@
(c) 7%A@ (d) 7@\$4
(e) None of these
58. What should come next in the following letter series?
BDFHJLNACEGIKMBDFHJLACEGIKBDFHJ
- (a) B (b) L
(c) M (d) F
(e) None of these
59. In a certain code DISPLAY is written as RHCQZBM. How is GROUPED written in that code?
- (a) PSHTEFQ (b) NQFVCDO
(c) NQFVEFQ (d) PSHTCDO
(e) None of these

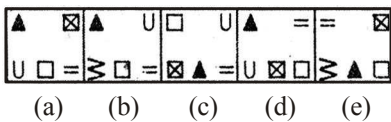
60. Among P, Q, R, T and W each having different weight, T is heavier than W and lighter than only P. Q is not the lightest. Who among them is definitely the lightest ?
- (a) R (b) W
(c) R or W (d) Data inadequate
(e) None of these

DIRECTIONS (61-65) : In each of the questions given below which one of the five answer figures should come after the problem figures if the sequence were continued ?

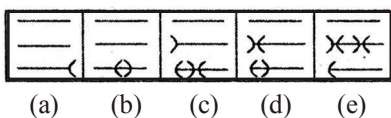
61. Problem Figures



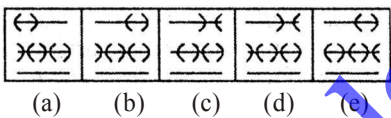
Answer Figures



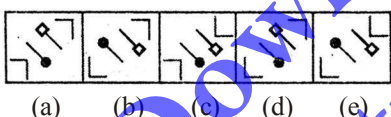
62. Problem Figures



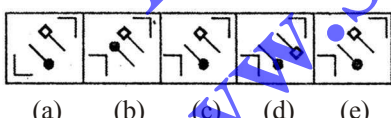
Answer Figures



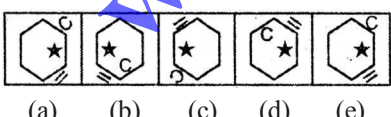
63. Problem Figures



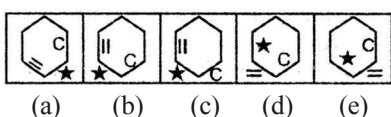
Answer Figures



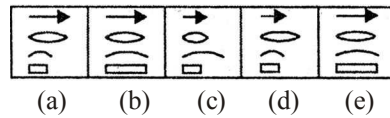
64. Problem Figures



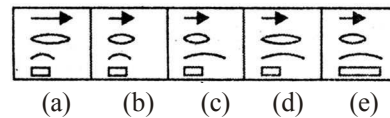
Answer Figures



65. Problem Figures



Answer Figures



DIRECTIONS (Qs. 66-70): Study the given information carefully and answer the given questions:

Auditions for a show were held in seven different cities of India Chennai, Bangalore, Cochin, Mumbai, Delhi, Bhopal and Kolkata, not necessarily in the same order, during the first seven months of the year 2011 (starting in January and ending in July). The auditions were held only in one city during a month. Auditions in only four cities were held between the Kolkata audition and the Cochin audition. The Kolkata audition was not held in June. Only one audition was held between the Kolkata audition and the Bangalore audition. The Chennai audition was held immediately after the Kolkata audition. The Delhi audition was held immediately before the Bhopal audition. The Bhopal audition was not held in May.

66. How many auditions were held between the Mumbai audition and the Chennai audition?
- (a) One (b) Two
(c) Three (d) None
(e) More than three
67. Which of the following statements is **true** according to the given sequence?
- (a) Mumbai audition was held in July
(b) Delhi audition was held in April
(c) Cochin audition was held before May
(d) Kolkata audition was held in January
(e) None is true
68. Four of the following five are alike in a certain way based on the given sequence and hence form a group. Which one does **not** belong to the group?
- (a) January-Kolkata (b) March-Bangalore
(c) June-Cochin (d) May-Delhi
(e) February-Chennai
69. During March, the audition was held in which of the following cities?
- (a) Bangalore (b) Kolkata
(c) Mumbai (d) Chennai
(e) None of these
70. The audition in Mumbai was held in which of the following months?
- (a) July (b) May
(c) February (d) March
(e) None of these

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-78): Read the following passage carefully and answer the questions given below it.

Since July 1991, the Government of India has effectively put the liberalisation policy into practice. The drastic steps even include some administrative reforms for pruning the government agencies. Last year Japanese business circles represented by the Ishikawa Mission called the attention of their Indian counterparts to what they considered to be the major impediments in India. However, thanks to the almost revolutionary reforms put into effect by the Indian government, those impediments either have been removed or now are on their way out. This development gives a new hope for the future of economic co-operation between the two countries. At the same time, it should be borne in mind that there is a stiff competition with other countries, notably China and South-East Asian countries, in this regard. The success stories of ASEAN countries welcoming Japanese investments with adequate infrastructure are already known in India but it may be useful if further studies of Japanese joint ventures in ASEAN countries be made by Indian business circles. The coastal areas of China have initiated a very active campaign to welcome foreign economic participation.

Beyond our bilateral relationship, India's more active participation in global economy is needed. India certainly deserves a far bigger share of world trade considering its vast resources. It is strongly hoped that the Indian government's recently initiated effort of enlarging its export market would bear fruit.

India has steadfastly maintained its parliamentary democracy since independence. Considering its size, its population and its internal complexity, the overall maintenance of national integrity and political stability under parliamentary democracy is remarkable and admirable indeed. Here lies the base for the status of India in the world. By effectively implementing its economic reform with the support of public opinion, this democratic polity of India has again demonstrated its viability and resilience. At the same time, it gives hope and inspiration to the whole world which faces the difficult problem of North-South confrontation.

71. The Ishikawa Mission during its visit to India emphasized on
- future economic co-operation between Japan and India.
 - need for removing policy and/or implementation hurdles.
 - need for a stiff competition.
 - striking down revolutionary reforms.
 - None of these
72. How did the Indian government react to the hurdles in the way of bilateral trade between India and Japan?
- The government, in principle, agreed for removal of these hurdles.
 - Bureaucracy succeeded in maintaining a status quo.
 - Government thought it was against liberalisation policy.
 - The Japanese delegation could not forcefully argue their case.
 - It failed to remove these hurdles.
73. What is the result of Japanese investments in ASEAN nations?
- It could not gather momentum for want of infrastructure.
 - The experiment failed because of stiff competition from other countries.
 - China and South-East Asian countries objected to Japanese investments.
 - The passage does not provide complete information..
 - None of these
74. Which of the following is TRUE about the author's view regarding India's participation in world trade?
- India should actively contribute in a big way as it had tremendous resources.
 - India's sharing in global economy has already been very fast and beyond its resources.
 - India should refrain from making efforts in enlarging its export market.
 - India needs to first strengthen its democracy.
 - None of these
75. It can be inferred from the content of the passage that the author is a/an
- political analyser
 - Japanese bureaucrat
 - economist
 - Japanese politician
 - Indian Prime Minister
76. The author seems to appreciate India's national integrity and political stability, particularly in view of which of the following ?
- the size of the country
 - India's population
 - its internal complexity
- None of the three
 - All the three
 - A & B only
 - B & C only
 - A & C only
77. The author feels that India has a better status in the world market because of its
- success in political stability and national integration in democratic set-up.
 - vast population.
 - giant size.
 - effective bilateral relationship with other countries.
 - foreign economic participation.
78. Which of the following statements is TRUE in the context of the passage?
- India's successful experiment of economic reform has become an inspiration to the world.
 - Size, population and internal complexity of our country are the barriers in the way of attaining national integrity and political stability.

- C. A few government agencies were not in favour of liberalisation policy at the beginning.
- (a) A only (b) B only
(c) C only (d) All the three
(e) None of these

DIRECTIONS (Qs. 79-82) : In each question below four words numbered (a), (b), (c) and (d) have been printed, one of which may be either inappropriate in the context or *wrongly spelt*. The letter of that word is the answer. If all the four words are correctly spelt and are appropriate in the context, mark (e), i.e. 'All correct', as the answer.

79. We are **already** (a) to **fight** (b) the **battle** (c) let the **enemy** (d) come. All correct (e)
80. Many people in India **cherish** (a) a desire to **immigrate** (b) to **developed** (c) countries to **make** (d) a fortune. All correct (e)
81. He took great **pains** (a) to **save** (b) many **dyeing** (c) folk arts and helped the artists to live an **honourable** (d) life. All correct (e).
82. Arun did his MBA from a **prestigious** (a) **institute** (b) by **securing** (c) first class in this **calendar** (d) year. All correct (e).

DIRECTIONS (Qs. 83-87): Rearrange the following sentences (A), (B), (C), (D) and (E) in the proper sequence to form a meaningful paragraph, then answer the questions given below them.

- A. The upsurge of public activism against the setting up of Special Economic Zones, which eventually forced the State Government to announce the scrapping of all 15 such projects, is an impressive case in point.
- B. Early last year, a similar agitation coerced the government into calling for a revision of the Goa Regional Plan 2011, a controversial document that opened up large swathes of land, including green belts and coastal stretches, for construction.
- C. The broad-based agitation against SEZs has demonstrated the power of popular protest in the State.
- D. Those opposed to the projects had questioned the propriety of the government acquiring large tracts of land and then selling them to promoters at low prices.
- E. A coastal State with an area of 3,700 square kilometers and a population of about 1.4 million, Goa has always been extremely sensitive to the impact of unrestrained economic development.
83. Which of the following should be the **FIRST** sentence?
(a) A (b) B (c) C (d) D (e) E
84. Which of the following should be the **SECOND** sentence?
(a) A (b) B (c) C (d) D (e) E
85. Which of the following should be the **THIRD** sentence?
(a) A (b) B (c) C (d) D (e) E
86. Which of the following should be the **FOURTH** sentence?
(a) A (b) B (c) C (d) D (e) E
87. Which of the following should be the **FIFTH (LAST)** sentence?
(a) A (b) B (c) C (d) D (e) E

DIRECTIONS (Qs. 88-92) : In each of the following sentences, an idiomatic expression or a proverb is highlighted. Select the alternative which best describes its use in the sentence.

88. He believes in the policy of **making hay while the sun shines**.
(a) giving bribes to get his work done
(b) seeking advice from one and all
(c) helping those who help him
(d) making the best use of a favourable situation
(e) None of these
89. His friends advised him to be fair and square in his dealings.
(a) careful (b) considerate
(c) polite (d) upright
(e) None of these
90. It is **high time** that India did something about the population problem.
(a) already late (b) appropriate time
(c) desired occasion (d) auspicious moment
(e) None of these
91. He is always **standing up** for the weak and oppressed.
(a) boosting the claims of
(b) championing the cause of
(c) seeking help of others for
(d) moving about with
(e) None of these
92. We should **give a wide** berth to bad characters.
(a) give publicity to (b) publicly condemn
(c) keep away from (d) not sympathise with
(e) None of these

DIRECTIONS (Qs. 93 - 100) : In the following passage there are blanks, each of which has been numbered. These numbers are also printed below the passage and against each five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

A good percentage of the population of India is tribal. The tribals live in the hills and forests of the country and have been little affected by the 93 currents of the plains. Practically all the states of India have their tribal population. The tribes are numerous, computed to about 200, some living in 94 regions in the dense forests, and others on the borders of villages. Some tribes are 95 to a few souls, while others like the Santhals, run into millions and are steadily 96 in numbers. During the British Period some of them were known as 'criminal tribes' for they showed 97 respect for the Indian Penal Code. After independence they have been named Scheduled Tribes. Under modern conditions isolation, however, has become difficult and the hill tribes are getting 98. The cultural traffic is two-way. Social reformers are taking civilisation to the hills, and the tribes, 99 their old occupations of hunting and 100 farming, are settling in villages, towns and cities as labourers and industrial workers.

93. (a) financial (b) proud
(c) cultural (d) unruly
(e) swift

94. (a) comfortable (b) marshy (c) wild (d) unpopulated (e) inhospitable
95. (a) devoted (b) confined (c) susceptible (d) related (e) attached
96. (a) constant (b) deteriorated (c) developing (d) increasing (e) decreasing
97. (a) abundant (b) genuine (c) superficial (d) exorbitant (e) scant
98. (a) civilized (b) demoralised (c) wiped-out (d) entertained (e) reduced
99. (a) escaping (b) with (c) enhancing (d) leaving (e) continuing
100. (a) productive (b) primitive (c) profitable (d) cultivatable (e) scientific

RESPONSE SHEET

- | | | | | |
|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|
| 1. (a) (b) (c) (d) (e) | 2. (a) (b) (c) (d) (e) | 3. (a) (b) (c) (d) (e) | 4. (a) (b) (c) (d) (e) | 5. (a) (b) (c) (d) (e) |
| 6. (a) (b) (c) (d) (e) | 7. (a) (b) (c) (d) (e) | 8. (a) (b) (c) (d) (e) | 9. (a) (b) (c) (d) (e) | 10. (a) (b) (c) (d) (e) |
| 11. (a) (b) (c) (d) (e) | 12. (a) (b) (c) (d) (e) | 13. (a) (b) (c) (d) (e) | 14. (a) (b) (c) (d) (e) | 15. (a) (b) (c) (d) (e) |
| 16. (a) (b) (c) (d) (e) | 17. (a) (b) (c) (d) (e) | 18. (a) (b) (c) (d) (e) | 19. (a) (b) (c) (d) (e) | 20. (a) (b) (c) (d) (e) |
| 21. (a) (b) (c) (d) (e) | 22. (a) (b) (c) (d) (e) | 23. (a) (b) (c) (d) (e) | 24. (a) (b) (c) (d) (e) | 25. (a) (b) (c) (d) (e) |
| 26. (a) (b) (c) (d) (e) | 27. (a) (b) (c) (d) (e) | 28. (a) (b) (c) (d) (e) | 29. (a) (b) (c) (d) (e) | 30. (a) (b) (c) (d) (e) |
| 31. (a) (b) (c) (d) (e) | 32. (a) (b) (c) (d) (e) | 33. (a) (b) (c) (d) (e) | 34. (a) (b) (c) (d) (e) | 35. (a) (b) (c) (d) (e) |
| 36. (a) (b) (c) (d) (e) | 37. (a) (b) (c) (d) (e) | 38. (a) (b) (c) (d) (e) | 39. (a) (b) (c) (d) (e) | 40. (a) (b) (c) (d) (e) |
| 41. (a) (b) (c) (d) (e) | 42. (a) (b) (c) (d) (e) | 43. (a) (b) (c) (d) (e) | 44. (a) (b) (c) (d) (e) | 45. (a) (b) (c) (d) (e) |
| 46. (a) (b) (c) (d) (e) | 47. (a) (b) (c) (d) (e) | 48. (a) (b) (c) (d) (e) | 49. (a) (b) (c) (d) (e) | 50. (a) (b) (c) (d) (e) |
| 51. (a) (b) (c) (d) (e) | 52. (a) (b) (c) (d) (e) | 53. (a) (b) (c) (d) (e) | 54. (a) (b) (c) (d) (e) | 55. (a) (b) (c) (d) (e) |
| 56. (a) (b) (c) (d) (e) | 57. (a) (b) (c) (d) (e) | 58. (a) (b) (c) (d) (e) | 59. (a) (b) (c) (d) (e) | 60. (a) (b) (c) (d) (e) |
| 61. (a) (b) (c) (d) (e) | 62. (a) (b) (c) (d) (e) | 63. (a) (b) (c) (d) (e) | 64. (a) (b) (c) (d) (e) | 65. (a) (b) (c) (d) (e) |
| 66. (a) (b) (c) (d) (e) | 67. (a) (b) (c) (d) (e) | 68. (a) (b) (c) (d) (e) | 69. (a) (b) (c) (d) (e) | 70. (a) (b) (c) (d) (e) |
| 71. (a) (b) (c) (d) (e) | 72. (a) (b) (c) (d) (e) | 73. (a) (b) (c) (d) (e) | 74. (a) (b) (c) (d) (e) | 75. (a) (b) (c) (d) (e) |
| 76. (a) (b) (c) (d) (e) | 77. (a) (b) (c) (d) (e) | 78. (a) (b) (c) (d) (e) | 79. (a) (b) (c) (d) (e) | 80. (a) (b) (c) (d) (e) |
| 81. (a) (b) (c) (d) (e) | 82. (a) (b) (c) (d) (e) | 83. (a) (b) (c) (d) (e) | 84. (a) (b) (c) (d) (e) | 85. (a) (b) (c) (d) (e) |
| 86. (a) (b) (c) (d) (e) | 87. (a) (b) (c) (d) (e) | 88. (a) (b) (c) (d) (e) | 89. (a) (b) (c) (d) (e) | 90. (a) (b) (c) (d) (e) |
| 91. (a) (b) (c) (d) (e) | 92. (a) (b) (c) (d) (e) | 93. (a) (b) (c) (d) (e) | 94. (a) (b) (c) (d) (e) | 95. (a) (b) (c) (d) (e) |
| 96. (a) (b) (c) (d) (e) | 97. (a) (b) (c) (d) (e) | 98. (a) (b) (c) (d) (e) | 99. (a) (b) (c) (d) (e) | 100. (a) (b) (c) (d) (e) |

Answer Key

1	(d)	11	(d)	21	(a)	31	(d)	41	(a)	51	(b)	61	(a)	71	(b)	81	(c)	91	(b)
2	(c)	12	(a)	22	(b)	32	(c)	42	(b)	52	(d)	62	(d)	72	(a)	82	(e)	92	(c)
3	(a)	13	(d)	23	(a)	33	(e)	43	(c)	53	(a)	63	(c)	73	(d)	83	(e)	93	(c)
4	(a)	14	(a)	24	(c)	34	(e)	44	(d)	54	(c)	64	(d)	74	(a)	84	(a)	94	(b)
5	(e)	15	(b)	25	(c)	35	(b)	45	(c)	55	(e)	65	(e)	75	(c)	85	(b)	95	(b)
6	(b)	16	(b)	26	(a)	36	(a)	46	(c)	56	(c)	66	(a)	76	(b)	86	(d)	96	(d)
7	(d)	17	(c)	27	(c)	37	(d)	47	(b)	57	(b)	67	(e)	77	(a)	87	(c)	97	(e)
8	(c)	18	(e)	28	(b)	38	(b)	48	(a)	58	(e)	68	(d)	78	(a)	88	(d)	98	(e)
9	(b)	19	(c)	29	(a)	39	(a)	49	(a)	59	(c)	69	(d)	79	(a)	89	(d)	99	(d)
10	(e)	20	(a)	30	(c)	40	(b)	50	(b)	60	(c)	70	(e)	80	(b)	90	(a)	100	(b)

Answers & Explanations

1. (d) $\frac{3}{5}$ of $\frac{4}{7}$ of $\frac{5}{12}$ of 1015 = $\frac{3}{5} \times \frac{4}{7} \times \frac{5}{12} \times 1015 = \frac{1015}{7} = 145$

2. (c) $1.5 \times 0.025 + (?)^2 = 0.1 \Rightarrow (?)^2 = 0.1 - 1.5 \times 0.025$
 $\Rightarrow (?)^2 = 0.1 - 0.0375 \Rightarrow ? = \sqrt{0.0625} = 0.25$

3. (a) $1.5^2 \times \sqrt{0.0375} = 2.25 \times 0.15 = 0.3375$

4. (a) $\sqrt{0.0289} \times 12 \div 1.5$
 $0.17 \times 8 \Rightarrow 1.36$

5. (e) 125% of 260 + ?% of 700 = 500
 \Rightarrow ?% of 700 = 500 - 125% of 260
 \Rightarrow ?% of 700 = 175

$$\therefore ? = \frac{175 \times 100}{700} = 25$$

6. (b) 45% of 750 - 25% of 480
 $= \frac{45 \times 750}{100} - \frac{25 \times 480}{100} = 337.5 - 120 = 217.5$

7. (d) $75^{8.5} \div 75^{3.8} = 75^{(8.5-3.8)} = 75^{4.7}$

9. (b) $3\frac{7}{11} + 7\frac{3}{11} \times 1\frac{1}{2} = \frac{40}{11} + \frac{80}{11} \times \frac{3}{2} = \frac{160}{11} = 14\frac{6}{11}$

10. (e) $1080 \div 12 \div 10 = \frac{1080}{12 \times 10} = 9$

11. (d) First start with the option (d).
 $1001 \times 25 = 25025$
 $1001 \times 67 = 67067$ etc.
 Thus 1001 is the largest number which divides the numbers of the type 25025, 67067 etc.

12. (a) Let the principal be P, then amount after 12 years = 2P
 \Rightarrow SI = (2P - P) = P

$$\text{Now, } I = \frac{P \times r \times t}{100} \Rightarrow P = \frac{P \times r \times 12}{100}$$

$$\text{or } r = \frac{100}{12} = \frac{25}{3} = 8\frac{1}{3}\%$$

13. (d) Applying successive discounts of 10%, 12% and 15% on 100, we get $100 \times 0.9 \times 0.88 \times 0.85 = 67.32$
 \Rightarrow Single discount = $100 - 67.32 = 32.68$

14. (a) Let the prices of two houses A and B be Rs 4x and Rs 5x, respectively for the last year.
 Then, the prices of A this year = Rs (1.25 × 4x) and that of B = Rs (5x + 50,000)

This year, Ratio of their prices = 9 : 10

$$\therefore \frac{1.25 \times 4x}{5x + 50,000} = \frac{9}{10}$$

$$\Rightarrow 50x - 45x = 450,000 \Rightarrow 5x = 4,50,000$$

$$\Rightarrow x = 90,000$$

Hence, the price of A last year was
 $4x = \text{Rs } 3,60,000$

15. (b) A three digit number to be exactly divisible by 5 must have either 0 or 5 at its units place.

Such numbers will be 100, 105, 110,, 995.

First term = 100, last term = 995

Let the required number be n.

To find the value of n, we may use the following formula of arithmetic progression,

$$T_n = a + (n-1)d \dots \dots \dots (1)$$

Where d = common difference = 5

$$T_n = 995$$

$$a = 100$$

Hence from (1)

$$995 = 100 + (n-1)5$$

$$\Rightarrow 5n = 900$$

$$n = 180$$

Digits to be used = 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

16. (b) $\begin{array}{ccccccc} 198 & & 194 & & 185 & & 169 & & \boxed{144} \\ & \underbrace{\hspace{1.5cm}}_{-2^2} & & \underbrace{\hspace{1.5cm}}_{-3^2} & & \underbrace{\hspace{1.5cm}}_{-4^2} & & \underbrace{\hspace{1.5cm}}_{-5^2} & \end{array}$

17. (c) The first, third, fifth and second, fourth terms are groups of consecutive natural numbers.

18. (e) The pattern of the number series is:

$$7 \times 2 - 3 = 11$$

$$11 \times 2 - 3 = 19$$

$$19 \times 2 - 3 = 35$$

$$35 \times 2 - 3 = 67$$

$$67 \times 2 - 3 = 134 - 3 = \boxed{131}$$

19. (c) The pattern of the number series is:

$$5 + 1^2 = 6$$

$$6 + 2^2 = 10$$

$$10 + 3^2 = 19$$

$$19 + 4^2 = 35$$

$$35 + 5^2 = 35 + 25 = \boxed{60}$$

20. (a) The pattern of the number series is:

$$1 + 2 = 3$$

$$3 + (2 + 3) = 8$$

$$8 + (2 + 3 + 5) = 18$$

$$18 + (2 + 3 + 5 + 7) = 35$$

$$35 + (2 + 3 + 5 + 7 + 9) = 61$$

21. (a) LHS = $21 + 12 = 33$

$$\text{RHS} = 15 + 15 = 30$$

$$\text{LHS} > \text{RHS}$$

22. (b) LHS = $\pm(18 - 7) = \pm 11$

$$\text{RHS} = \sqrt{121} = \pm 11$$

23. (a) LHS = $(34 - 4) \times 5 = 150$

$$\text{RHS} = (16 \times 8 + 16) = 16(8 + 1) = 144$$

$$\text{LHS} > \text{RHS}$$

24. (c) LHS = $133 - 16 = 117$

$$\text{RHS} = 49 \times 3 = 147$$

$$\text{LHS} < \text{RHS}$$

25. (c) LHS = $7 + 6 = 13$

$$\text{RHS} = 100 \div 4 = 25$$

$$\text{LHS} < \text{RHS}$$

26. (a) $\sqrt{10609} \times \sqrt{7938.81}$

$\sqrt{10609} = 103$, by long division method, as below:

$$\begin{array}{r} 103 \\ 10 \overline{) 10609} \\ \underline{100} \\ 609 \\ 203 \overline{) 609} \\ \underline{609} \\ 0 \end{array}$$

Also, $\sqrt{7938.81} = 89.1$, by long division method, as below:

$$\begin{array}{r} 89.1 \\ 8 \overline{) 79388.81} \\ \underline{64} \\ 169 \\ \underline{1538} \\ 1521 \\ \underline{1781} \\ 1781 \\ \underline{1781} \\ 0 \end{array}$$

Hence $103 \times 89.1 = 9177.3 \approx 9200$

27. (c) Let x be there in place of question mark.

$$\text{So, } \left[\left[(13)^2 \right]^3 \right]^x = 2197 \Rightarrow \left[(169)^3 \right]^x = 2197$$

$$4826809^x = 2197, \text{ taking } \log_{10} \text{ on both the sides}$$

$$x \log_{10} (4826809) = \log_{10} 2197$$

$$\Rightarrow x \times 6.68366 = 3.34183 \Rightarrow x = \frac{1}{2} \approx 0.5$$

28. (b) $18.4\% \text{ of } 656 + 12.7\% \text{ of } 864 = 0.184 \times 656 + 0.127 \times 864 = 120.704 + 109.728 = 230.432 \approx 231$

29. (a) $(98.4)^2 + (33.6)^2 = 9682.56 + 1128.96 = 10811.52 \approx 10812$

30. (c) $8787 \div 343 \times \sqrt{50} = 25 \times 7 = 175 \approx 180$

31-35.

Day 1				Day 2		
Vehicle	Time in hr	Distance in km	Speed in km/hr	Time in hr	Distance in km	Speed in km/hr
A	16	832	52	16	864	54
B	12	516	43	18	774	43
C	11	693	63	18	810	45
D	12	552	46	15	765	51
E	16	935	58.4	14	546	39
F	19	703	37	12	636	53

31. (d) Vehicle B.

32. (c) Speed of vehicle A on day 1 = 52 km/hr

Speed of vehicle C on day 1 = 63 km/hr

Difference = $63 - 52 = 11$ km/hr

33. (e) Speed of vehicle can day 2 = 45 km/hr

$$\Rightarrow \left(45 \times \frac{5}{18} \right) \text{ m/sec} = 12.5 \text{ m/sec}$$

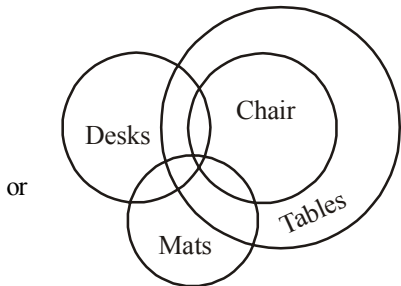
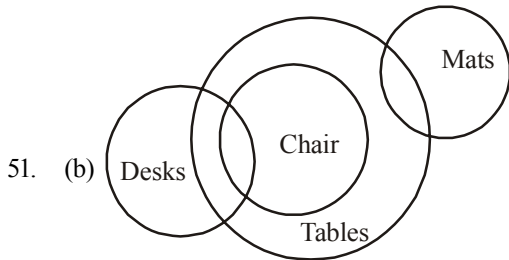
34. (e) Percentage

$$= \frac{\text{Distance travelled by vehicle F on day 2}}{\text{Distance travelled by vehicle F on day 1}} \times 100$$

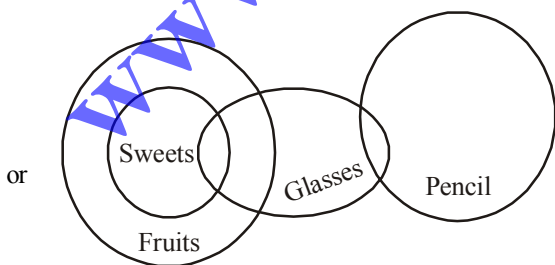
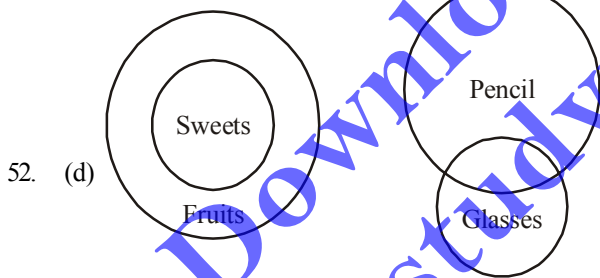
$$= \frac{636}{703} \times 100 \approx \frac{630}{700} \times 100 \approx 90\%$$

35. (b) Speed of vehicle D on day 2 = 51
 Speed of vehicle E on day 2 = 39

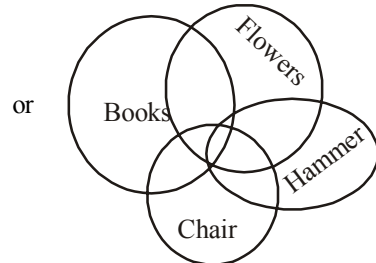
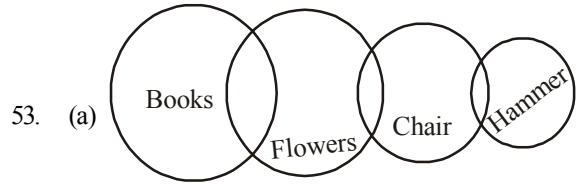
$$\text{Required ratio} = \frac{51}{39} = \frac{17}{13} \text{ or } 17:13$$



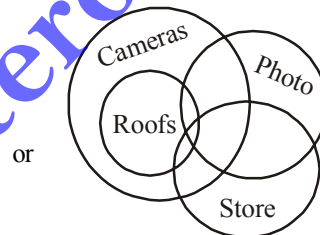
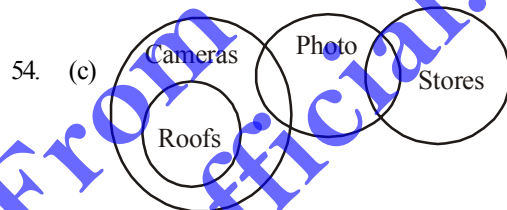
- I. False II. True III. False



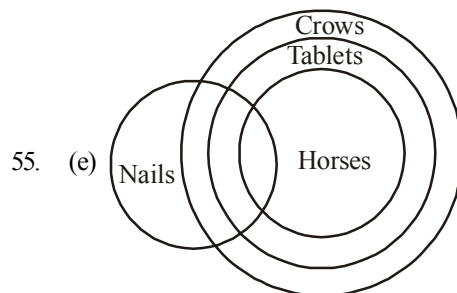
II. False. From both figures it is clear that either I or III follows.



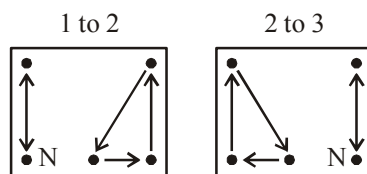
- I. False II. False III. False



- I. False II. False III. True



61. (a) I. True II. True III. True
 The movement and other changes in designs can be shown as :



These two steps are repeated alternately.

62. (d) In the subsequent figures respectively one, two zero..... curve(s) is/are added and curves move along the line segment and get reversed in each subsequent figure.
63. (c) In the subsequent figures one design is left intact while other three designs are inverted.
64. (d) In the subsequent figures the star moves three steps in clockwise direction inside the hexagon after every two figures. The equal sign moves respectively one and two step(s) in clockwise direction along the sides of the hexagon. The design C moves in and out the hexagon in the subsequent figures and moves respectively two and one step(s) in clockwise direction. In other words, this problem is based on the rule (1) = (5) and hence (2) = (6).
65. (e) In the subsequent figures respectively two and three designs change size alternately in a set order.

(Qs. 66-70).

From the information given we can draw the following table

S.No.	Month	City
1.	January	Mumbai
2.	February	Kolkata
3.	March	Chennai
4.	April	Bangalore
5.	May	Delhi
6.	June	Bhopal
7.	July	Cochin

66. (a) Only one audition held in Kolkata.
68. (d) (May-Delhi) is correct sequence rest are in Month (+ 1) city manner.
69. (d) In March audition held in Chennai.
70. (e) Audition in Mumbai held in January.
71. (b) Japanese business circles represented by the Ishikawa Mission called the attention of their Indian counterparts to what they considered to be the major impediments in India.
72. (a) The Indian government put into effect revolutionary reforms to remove the hurdles.
74. (a) India deserves a far bigger share of world trade considering its vast resources.
79. (a) It should be 'ready' in place of 'already'.
80. (b) Replace 'immigrate' by 'emigrate'.
81. (c) It should be 'dying' at place of 'dyeing'.

Sol. For (Qs. 83-87) : The arrangement EABDC is correct.

The paragraph is clearly taking about Goa state and hence E has to be opening sentence is the paragraph. This is followed by A where the phrase, 'is an impressive case in point', which is an example of what is being said in E. A is followed by E as 'a similar agitation' mentioned in B refers to the public activism mentioned in A. B is further followed by D and C.

□□□

9

PRACTICE SET

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $\frac{1}{4}$ th of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Q. 1-10) : What should come in place of the question mark (?) in the following questions?

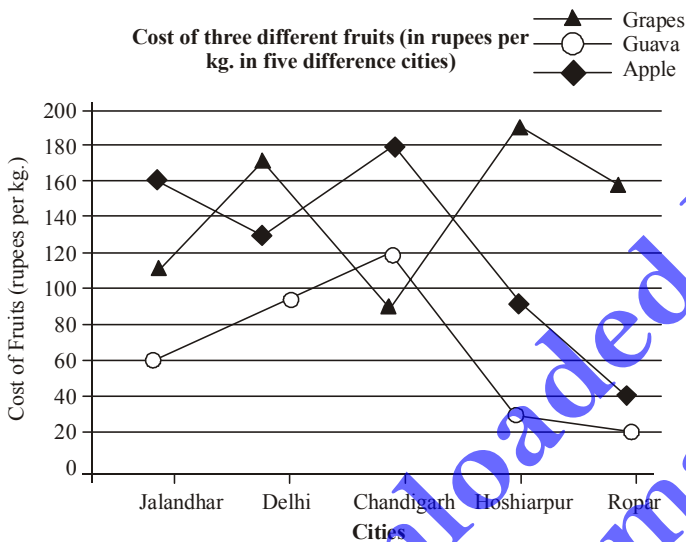
- $\sqrt{7} = \pm 75$
 - 5625
 - 75
 - 1500
 - Cannot be determined
 - None of these
- $\frac{21}{8} \div \frac{7}{72} \times \frac{1}{171} = ?$
 - $\frac{9}{19}$
 - $\frac{1}{3}$
 - $\frac{5}{19}$
 - $\frac{3}{19}$
 - None of these
- $4\frac{1}{2} + 6\frac{2}{3} - 5\frac{1}{3} = ?$
 - $15\frac{1}{2}$
 - $16\frac{2}{3}$
 - $16\frac{1}{2}$
 - 17
 - None of these
- $792.02 + 101.32 - 306.76 = ?$
 - 893.34
 - 1200.10
 - 997.11
 - 586.58
 - None of these
- $300\% \text{ of } 150 = ?\% \text{ of } 600$
 - 75
 - 45
 - 450
 - $133\frac{1}{2}$
 - None of these
- $34.95 + 240.016 + 23.9800 = ?$
 - 299.09
 - 298.0946
 - 298.111
 - 298.946
 - None of these
- $48.95 - 32.006 = ?$
 - 16.089
 - 16.944
 - 16.35
 - 16.89
 - None of these
- $3889 + 12.952 - ? = 3854.002$
 - 47.95
 - 47.752
 - 47.095
 - 47.932
 - None of these
- $? + 72.64 = 74.64$
 - 145.28
 - 2.00
 - 145.28
 - 147.28
 - None of these

10. $6.25 \div 0.0025 = ?$
 (a) 1800 (b) 2300
 (c) 1700 (d) 2500
 (e) None of these
11. Which is the smallest of the following numbers ?
 (a) $\sqrt{7}$ (b) $\frac{1}{\sqrt{7}}$
 (c) $\frac{\sqrt{7}}{7}$ (d) $\frac{1}{7}$
 (e) None of these
12. Two equal sums were borrowed at 8% simple interest per annum for 2 years and 3 years, respectively. The difference in the interests was ₹ 56. The difference in the interests was ₹ 56. The sum borrowed were
 (a) ₹ 690 (b) ₹ 700
 (c) ₹ 740 (d) ₹ 780
 (e) None of these
13. A machine is sold at a profit of 10%. Had it been sold for ₹ 80 less, there would have been a loss of 10%. The cost price of the machine is
 (a) ₹ 350 (b) ₹ 400
 (c) ₹ 450 (d) ₹ 520
 (e) None of these
14. A jar of oil was four fifths full. When six bottles of oil were taken out and four bottles of oil were poured into, it was three fourths full. How many bottles of oil were contained by the jar ?
 (a) 10 (b) 20
 (c) 30 (d) 40
 (e) None of these
15. During a journey of 80 km a train covers first 60km with a speed of 40 km/h and completes the remaining distance with a speed of 20 km/h. What is the average speed of the train during the whole journey?
 (a) 30 km/h (b) 32 km/h
 (c) 36 km/h (d) 40 km/h
 (e) None of these
16. An aeroplane takes off 30 minutes later than the scheduled time and in order to reach its destination 1500 km away in time, it has to increase its speed by 250 km/h from its usual speed. Find its usual speed.
 (a) 1000 km/h (b) 750 km/h
 (c) 850 km/h (d) 650 km/h
 (e) None of these
17. In an examination 35% of the candidates failed in one subject and 42% failed in another subject. While 15% failed in both the subjects. If 2500 candidates appeared at the examination, how many students passed in either subject but not in both?
 (a) 325 (b) 1175
 (c) 2125 (d) 1230
 (e) None of these
18. If the length of a certain rectangle is decreased by 4 cm and the width is increased by 3 cm, a square with the same area as the original rectangle would result. The perimeter of the original rectangle (in centimetres) is :
 (a) 44 (b) 46
 (c) 48 (d) 50
 (e) None of these
19. Raju decided to marry 3 years after he gets a job. He was 17 years old when he passed class 12th. After passing class 12th, he had completed his graduation course in 3 years and PG Course in 2 years. He got the job exactly 1 year after completing his PG Course. At what age will he get married?
 (a) 27 years (b) 26 years
 (c) 28 years (d) 23 years
 (e) None of these
20. The angles of a triangle are in the ratio of 5 : 6 : 7, respectively. What is the sum of the smallest angle and the largest angle together?
 (a) 130° (b) 100°
 (c) 110° (d) 140°
 (e) None of these
-
- DIRECTIONS (Qs. 21-25): Find out the approximate value which should replace the question mark (?) in the following questions. (You are not expected to find out the exact value.)**
21. $\sqrt{1000} + \frac{3.001}{4.987}$ of 1891.992 = ?
 (a) 2500 (b) 1230
 (c) 1640 (d) 1525
 (e) 2130
22. $0.0004 \div 0.0001 \times 36.000009 = ?$
 (a) 0.10 (b) 1.45
 (c) 145 (d) 14.5
 (e) 1450
23. 137% of 12345 = ?
 (a) 17000 (b) 15000
 (c) 1500 (d) 1430
 (e) 900
24. $12.25 \times ? \times 21.6 = 3545.64$
 (a) 20 (b) 12
 (c) 15 (d) 13
 (e) None of these
25. $\sqrt[3]{4096} = ?$
 (a) 16 (b) 26
 (c) 18 (d) 24
 (e) None of these
-
- DIRECTIONS (Qs. 26-30): What will come in place of the question mark (?) in the following number series?**
26. 2 9 30 105 ? 2195
 (a) 432 (b) 426
 (c) 440 (d) 436
 (e) None of these
27. 3 4 12 45 ? 1005
 (a) 152 (b) 198
 (c) 144 (d) 192
 (e) None of these

28. 1 3 9 31 ? 651
 (a) 97 (b) 127
 (c) 129 (d) 109
 (e) None of these
29. 5 ? 4 7.5 17 45
 (a) 3.5 (b) 3
 (c) 2.5 (d) 2
 (e) None of these
30. 15 30 ? 40 8 48
 (a) 10 (b) 20
 (c) 18 (d) 12
 (e) None of these

DIRECTIONS (Qs. 31-35): Study the following information carefully and answer the given questions.

Cost of three different fruits (in rupees per kg. in five different cities)



31. In which city is the difference between the cost of one kg of apple and cost of one kg of guava second lowest?
 (a) Jalandhar (b) Delhi
 (c) Chandigarh (d) Hoshiarpur
 (e) Ropar
32. Cost of one kg of guava in Jalandhar is approximately what percent of the cost of two kgs of grapes in Chandigarh?
 (a) 66 (b) 24
 (c) 28 (d) 34
 (e) 58
33. What total amount will Ram pay to the shopkeeper for purchasing 3 kgs of apples and 2 kgs of guavas in Delhi?
 (a) ₹ 530/- (b) ₹ 450/-
 (c) ₹ 570/- (d) ₹ 620/-
 (e) ₹ 490/-
34. Ravinder had to purchase 45 kgs of grapes from Hoshiarpur. Shopkeeper gave him discount of 4% per kg. What amount did he pay to the shopkeeper after the discount?
 (a) ₹ 8,280/- (b) ₹ 8,104/-
 (c) ₹ 8,340/- (d) ₹ 8,550/-
 (e) ₹ 8,410/-

35. What is the respective ratio between the cost of one kg of apples from Ropar and the cost of one kg of grapes from Chandigarh?
 (a) 3 : 2 (b) 2 : 3
 (c) $2^2 : 3^2$ (d) $4^2 : 9^2$
 (e) $9^2 : 4^2$

REASONING ABILITY

DIRECTIONS (Qs. 36-40): In these questions, relationships between different elements is shown in the statements. These statements are followed by two conclusion.

Give answer (a) if **only** conclusion **I** follows
 Give answer (b) if **only** conclusion **II** follows
 Give answer (c) if **either** conclusion **I** or conclusion **II** follows
 Give answer (d) if **neither** conclusions **I** nor conclusion **II** follows
 Give answer (e) if **both** conclusions **I** and **II** follows

36. **Statement:** $R \geq S \geq T > U > X; T < V < W$
Conclusions: **I** $R > X$
II $X < W$
37. **Statement:** $E = F < G < H, G \geq I$
Conclusions: **I** $H > I$
II $E \geq I$
38. **Statement:** $A > B > F > C; D > E > C$
Conclusions: **I** $C < A$
II $B > D$
39. **Statement:** $K \leq L \leq M = N; P \geq O \geq N$
Conclusions: **I** $K < P$
II $K = P$
40. **Statement:** $D < E < F < G; K > F$
Conclusions: **I** $K \leq G$
II $K > D$
41. Which of the following will come next in the following series?
 0 9 0 1 9 0 1 2 9 0 1 2 3 9 0 1 2 3 4 9 0 1 2 3 4 5 9 0 1 2 3 4 5
 (a) 0 (b) 6
 (c) 9 (d) 7
 (e) 4

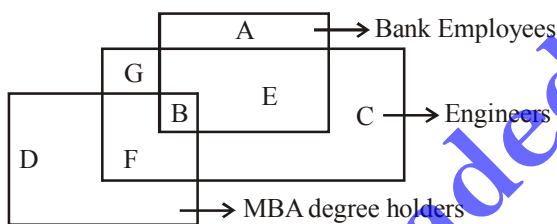
DIRECTIONS (Qs. 42-44): Study the following information to answer the given question.

Amongst five friends, A, B, C, D and E, each bought a mobile phone for a different price. A paid more than both C and E. Only B paid more than D. E did not pay the minimum amount. E paid ₹ 8,000 for the phone.

42. Which of the following is true with regard to the given information?
 (a) Only two people paid a price less than the price paid by B
 (b) E paid more than C and B
 (c) No one paid more amount than that paid by C
 (d) Amongst the five friends, C is most likely to have paid ₹ 9,000 for the mobile phone
 (e) None is true
43. If D paid ₹ 17,000 more than the price paid by E, which of the following could possibly be the amount paid by A?
 (a) ₹ 35,000/- (b) ₹ 16,000/-
 (c) ₹ 7,500/- (d) ₹ 26,000
 (e) ₹ 6,500

44. Who paid the third highest amount for the mobile phone ?
 (a) A (b) B
 (c) C (d) D
 (e) E
45. Veena walked 5m towards north, took a left turn and walked 7 m. She took a left turn again and walked 8m before taking a left turn and walking 7 m. She then took a final left turn and walked 1 m before stopping. How far is Veena from the starting point ?
 (a) 3m (b) 6m
 (c) 4m (d) 2m
 (e) 7m
46. In a certain code IDEAS is written as HEDBR and WOULD is written as VPTMC. How will RIGHT be written in the same code ?
 (a) QJHIS (b) QJFGS
 (c) SHHGU (d) QJFIU
 (e) QJFIS

DIRECTIONS (Qs. 47-50): Each of the questions given below is based on the given diagram. The diagram shows three figures each representing Engineers, MBA degree holders and Bank employees.



47. Which of the following does the group B represent in the above diagram ?
 (a) All such engineers who are not MBA degree holders
 (b) Such bank employees who are engineers but not MBA degree holders
 (c) All such engineers who are MBA degree holders but are not bank employees
 (d) All such MBA degree holders who are not bank employees
 (e) All such bank employees who are engineers as well MBA degree holders
48. Which of the following groups represents all such persons who are MBA degree holders but are neither engineers nor bank employees ?
 (a) Only G (b) Only D
 (c) D and G (d) Only C
 (e) Not represented in the diagram
49. Which of the following represents such engineers who are MBA degree holders but not bank employees ?
 (a) G and B
 (b) Only F
 (c) D
 (d) G
 (e) None of these

50. Which of the following correctly represents such engineers who are neither bank employees nor MBA degree holders?
 (a) Only G (b) C and B
 (c) A and D (d) C and G
 (e) Only C

DIRECTIONS (Qs. 51-55): Study the given information carefully and answer the given questions.

Eight people - J, K, L, M, N, O, P and Q are sitting around a circular table facing the centre, not necessarily in the same order. O is sitting third to the right of M. There is only one person sitting between M and J. There are only three people between J and K. P is an immediate neighbour of J. There are only three people between P and L. N is second to the right of P.

51. Which of the following is **true** regarding the given arrangement?
 (a) M is an immediate neighbour of K
 (b) N is an immediate neighbour of J
 (c) P is second to the left of O
 (d) There are four people between N and O.
 (e) None is true
52. Who is sitting second to the left of the one who is sitting second to the left of Q?
 (a) M (b) K
 (c) N (d) L
 (e) J
53. 'Four of the following five are alike in a certain way based on their seating positions in the above arrangement and so form a group. Which one does **not** belong to the group?
 (a) PQ (b) KL
 (c) MN (d) QO
 (e) KO
54. What is N's position with respect to K?
 (a) Second to the left (b) Second to the right
 (c) Third to the left (d) Third to the right
 (e) Fourth to the left
55. How many people are sitting between K and P when counted from the right side of K?
 (a) One (b) Two
 (c) Three (d) None
 (e) More than three

DIRECTIONS (Qs. 56-60): In each of the questions below, two statements are given followed by two conclusions numbered I and II. You have to take the two statements to be true even if they seem to be at variance from the commonly known facts and then decide which of the given conclusions logically follows from the given statement disregarding the commonly known facts.

Give answer (a) if **only** conclusion I follows

Give answer (b) if **only** conclusion II follows

Give answer (c) if **either** conclusion I or conclusion II follows

Give answer (d) if **neither** conclusion I nor conclusion II follows

Give answer (e) if **both** conclusions I and II follows

56. **Statements :** Some rings are circles.
 No circle is a square.

Conclusions : I No ring is a square.

II. All rings are squares.

57. **Statements :** All rows are lines.
All lines are queues.
Conclusions: I All rows are queues.
II Atleast some queues are lines.

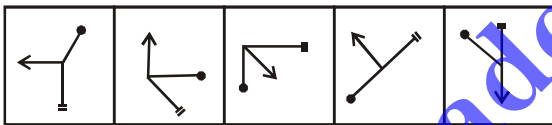
58. **Statements :** All laptops are computers.
Some laptops are notebooks.
Conclusions: I Some notebooks are computers
II All notebooks are computers.

59. **Statements :** Some participants are students.
Some students are boys.
Conclusions: I No boy is a participant.
II All boys are participants.

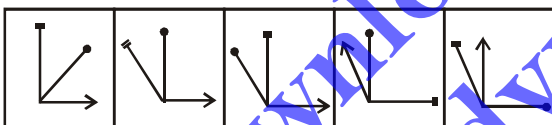
60. **Statements :** All sparrows are birds.
No birds is a reptile.
Conclusions: I No sparrow is a reptile.
II Some reptiles are sparrows.

DIRECTIONS (Qs. 61-65): In each of the questions given below which one of the five answer figures on the top should come after the problem figures on the bottom, if the sequence were continued?

61. **Problem Figures**



Answer Figures



62. **Problem Figures**

S	Δ	R	S	*	R	*	R	A	*	=	A	=	A	T
T	O	4	Δ	4	A	S	Δ	3	R	3	T	*	R	T
3	T	A	T	3	T	T	9	T	S	T	9	S	□	9

Answer Figures

A	T	T	T	K	=	=	O	T	=	K	T	=	K	T
=	*	□	A	T	9	A	T	9	S	*	A	A	T	9
S	K	9	*	S	□	*	S	□	□	9	T	*	S	□

63. **Problem Figures**

3	⊗	K	⊗	3	R	S	⊗	A	⊗	K	2	K	⊗	3	
		S	R		A			R	2		A	3		S	R
2	A	S	K	K	3	S	R	A	2						

Answer Figures

⊗	2/R	A	K/R	⊗	2/R	A	K/S	A	K/3
	S		S		S		R/3		S/R
K	A	2	⊗	K	A	2	⊗	2	⊗

64. **Problem Figures**

D	S	S	D	↑	Δ	Δ	↑	↑	Δ	
Δ	P		↑	Δ	N	P	P	N	D	P
↑	N	N	P	S	D	D	S	S	N	

Answer Figures

D	Δ	S	P	D	N	D	P	↑	P	
S	P		↑	N	S	Δ	S	N	D	N
↑	N	D	Δ	↑	P	↑	Δ	S	Δ	

65. **Problem Figures**

*	S	4	K	K	S	4	*	*	4
R		S		4		R		S	
4	K	*	R	R	*	K	S	R	K

Answer Figures

*	K	R	K	R	K	*	K	S	*
S		S		4		4		4	
R	4	*	4	*	S	R	S	K	R

DIRECTIONS (Qs. 66-70) : Following questions are based on five words given below :

WIT BAR URN ELF TOP

(The new words formed after performing the mentioned operations may or may not necessarily be meaningful English words)

66. If in each of the words, all the alphabets are arranged in English alphabetical order within the word, how many words will NOT begin with a vowel ?
(a) None (b) One
(c) Two (d) Three
(e) More than three
67. How many letters are there in the English alphabetical series between second letter of the word which is second from the right and the third letter of the word which is third from the left of the given words?
(a) One (b) Two
(c) Three (d) Four
(e) Five
68. If in each of the given words, each of the consonants is changed to previous letter and each vowel is changed to next letter in the English alphabetical series, in how many words thus formed will no vowels appear ?
(a) None (b) One
(c) Two (d) Three
(e) More than three

69. If the last alphabet in each of the words is changed to the next alphabet in the English alphabetical order, how many words having two vowels (same or different vowels) will be formed ?
- (a) None (b) One
(c) Two (d) Three
(e) Four
70. If the given words are arranged in the order as they would appear in a dictionary from left to right, which of the following will be fourth from the left ?
- (a) WIT (b) BAR
(c) URN (d) ELF
(e) TOP
- (c) thinks that the United Nations should have admired the US and the UK
(d) blames the global public opinion
(e) does not hold any specific viewpoint.
72. According to the author, the world is heading towards
- (a) multipolarity from unipolarity
(b) unipolarity from bipolarity
(c) multipolarity from bipolarity
(d) bipolarity from multipolarity
(e) not mentioned in the passage
73. What, according to the passage, has made US a super power?
- (a) Its "big-brother" attitude towards other countries
(b) Its global reach, ambition and might
(c) Its tactful alignment with UK
(d) Its war against Iraq for a noble cause
(e) None of these
74. Which of the following statements is TRUE in the context of the passage?
- (a) The world is heading towards unipolarity.
(b) The 'multipolarity to unipolarity' transition is certain.
(c) The unipolarity phase is likely to be short-lived.
(d) Primacy and dominance are seldom exhibited by the US.
(e) None of these
75. Which of the following can be inferred from the passage? The author thinks that the US-UK combine should be blamed because they have
- A. converted the world into a bipolar sphere
B. disregarded anti-war global public opinion
C. downgraded the esteemed United Nations
(a) All the three
(b) Only (A) and (C)
(c) Only (A) and (B)
(d) Only (B) and (C)
(e) None of these
76. "Unipolar world" as used in the passage can be best explained by which of the following?
- (a) The world without any independent country and governed by only one superpower
(b) Existence of only one superpower with all other countries either bandwagoning or hiding
(c) The world without any geographic or political boundaries
(d) The unilateral governance with anarchy
(e) None of these
77. Why do US interests assume importance in deciding foreign policies of any other country?
- (a) US is strong militarily and economically.
(b) It is hegemonistic and confronts all other small powers.
(c) It expects others to wag tails before it.
(d) Other countries are in a multipolar state.
(e) None of these
78. What is the author's view about middle powers dealing with big powers?
- (a) They can balance, hide or bandwagon, depending upon the issues.
(b) They can't afford to confront big powers as they might perish.

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-82) : Read the following passage carefully and answer the questions given below it. Certain words/phrases are printed in **bold** to help you to locate them while answering some of the questions.

Monopolies are bad in national politics and worse in international politics. The unipolar world led by the US is an example of political monopoly. In the language of history and politics, monopolies are discussed in terms of balance of power. What we have today is an imbalance of power. The US-led war against Iraq needs to be seen in the context of this imbalance. There has been much talk about the need for a multipolar world as an ideal solution to the existing anarchy in the international arena. The US – UK combine have been considered to be the perpetrators of the war. They disregarded global public opinion and have gone outside the mandate of the United Nations. This is an indication of US considering itself the only superpower. Its consideration may be justified because it has all the **pervading** might and also the necessary will. Its might is in two domains: one, military, and the other, economic. On every issue of any importance that **confronts** foreign policy-making of any country, US interests become vital. This omnipresence of the US makes it different from any other country. Some political observers argue that this is temporary, that the Russians will be back; that the Germans, Japanese, Europeans are coming, that China is not far away. In short, we occupy a period of **metamorphosis** from a bipolar to a multipolar world, a period that may constitute a unipolar moment but that phase may be over shortly. When will this unipolar moment be over? None has the answer to this question. Most observers view US as somewhere between primacy and dominance, depending on the issue. The main question is how to deal with hegemony, primacy or dominance. In dealing with a big power, a smaller power must choose either balancing or bandwagoning or hiding. In a unipolar world, the general trend of foreign policy will be to **bandwagon**. Middle powers will need to bandwagon less than small powers and on particular issues may be able to balance or hide.

71. For initiating the war, the author of the passage
- (a) appreciates the joint action of the US and the UK
(b) considers the war as unjustified and blames the US and the UK

- (c) They must always shy away from big powers to protect themselves.
 (d) They would like neither to bandwagon nor hide.
 (e) None of these

DIRECTIONS (Qs. 79-80): Which of the following is most OPPOSITE in meaning of the word given in bold as used in the passage?

79. **Bandwagon**

- (a) unconditionally supporting
 (b) opposing
 (c) lobbying
 (d) influencing significantly
 (e) diverting

80. **Pervading**

- (a) spreading all over
 (b) accommodating the maximum
 (c) with a limited reach
 (d) without influence
 (e) of less importance

DIRECTIONS (Qs. 81-82): Choose the word which is most nearly the SAME in meaning as the word in bold as used in the passage.

81. **Confronts**

- (a) involves (b) opposes
 (c) counters (d) safeguards
 (e) ignores

82. **Metamorphosis**

- (a) multiples (b) agony
 (c) disaster (d) lethargy
 (e) transition

DIRECTIONS (Qs. 83-87): Which of the phrases (a), (b), (c) or (d) given below each sentence should replace the phrase given in bold in the following sentence to make the sentence grammatically correct if it has an error in it? If the sentence is correct as it is and no correction is required, mark (e) i.e. 'No correction required' as the answer.

83. The honourable court **had taken a leniency view** because the accused had no previous criminal record.
 (a) had viewed leniency
 (b) had taken a leniency viewing
 (c) had taken a lenient view
 (d) took a lenient view
 (e) No correction required
84. Maintaining global peace is our **self-made commitment** to the world.
 (a) self-making commitment
 (b) self-made committee
 (c) made of self-commitment
 (d) self-commitment made
 (e) No correction required
85. The dinner party hosted by the President at the club was shifted to **an undisclosed location**.
 (a) a locality undisclosed
 (b) a undisclosed location
 (c) an undisclosed location
 (d) location undisclosedly
 (e) No correction required

86. The government should launch such projects which **should reversible** the destructive cycle of flood and drought.

- (a) should have reversible
 (b) should be reverse
 (c) should have been reverse
 (d) should reverse
 (e) No correction required

87. A committee comprising eminent experts from various fields **were setting up**.

- (a) was set up
 (b) were being set up
 (c) was setting up
 (d) was being set up
 (e) No correction required

DIRECTIONS (Qs. 88-92): In each sentence below, four words have been printed in bold and lettered as (a), (b), (c) and (d). One of them may be wrongly spelt or inappropriate in the context of the sentence or grammatically incorrect. The letter of that word is the answer. If there is no error of any of the above types, the answer is (e), i.e., 'No Error'.

88. Imported items are **costlier** (a) than **there** (b) **domestic** (c) **counterparts** (d). No error (e)

89. **Although** (a) I was paid **significant1y** (b) low, I found my salary to be **insufficient** (c) or rather **inadequate** (d). No error (e)

90. An **exorbitantly** (a) rigid attitude may **prove** (b) very **dangerous** (c), even **fatal** (d) No error (e).

91. There is hardly any **resemblance** (a) between the **faces** of (b) the so-called **identical** (c) **twins** (d). No error (e)

92. India has **progressed** (a) **remarkably** in (b) **exercising** (c) our commitments in international **affairs** (d) . No error (e).

DIRECTIONS (Qs. 93-97): Rearrange the following sentences (A), (B), (C), (D) and (E) in the proper sequence to form a meaningful paragraph, then answer the questions given below them.

- A. On the Republican side, the Iowa results have left the picture somewhat murkier.
 B. Mike Huckabee beat the putative front-runner, Mitt Romney, by a margin of 34.4 per cent to 25.4 per cent, but is not expected to carry the momentum forward into New Hampshire.
 C. Mr. Huckabee's victory is attributable largely to the strong support he got from evangelical Christians who are estimated to make up as much as 60 per cent of the caucus – goers.
 D. Social and religious conservatives will constitute only small proportion of voters, in which national security and fiscal concerns are expected to be the main issues.
 E. However, while Mr. Romney might be free of a Huckabee challenge in New Hampshire, he might be hard pressed to fend off John McCain and Rudolph Guiliani, both of whom largely stayed out of the Iowa campaign.

93. Which of the following should be the **FIRST** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E
94. Which of the following should be the **SECOND** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E
95. Which of the following should be the **THIRD** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E
96. Which of the following should be the **FOURTH** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E
97. Which of the following should be the **FIFTH (LAST)** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E

DIRECTIONS (Qs. 98 - 100): In each of the following sentences, an idiomatic expression or a proverb is highlighted. Select the alternative which best describes its use in the sentence.

98. The class could not **keep a straight** face on hearing the strange pronunciation of the new teacher.
 (a) remain silent
 (b) remain serious
 (c) remain mute
 (d) remain disturbed
 (e) None of these
99. The parliamentary inquiry into the Bofors deal did not **bring to light** any startling facts.
 (a) prove (b) probe
 (c) highlight (d) disclose
 (e) None of these
100. His speech **went down well with** the majority of the audience.
 (a) found acceptance with
 (b) was attentively listened to by
 (c) was appreciated by
 (d) was applauded by
 (e) None of these

RESPONSE SHEET

- | | | | | | | | | | |
|-----|---------------------|-----|---------------------|-----|---------------------|-----|---------------------|------|---------------------|
| 1. | (a) (b) (c) (d) (e) | 2. | (a) (b) (c) (d) (e) | 3. | (a) (b) (c) (d) (e) | 4. | (a) (b) (c) (d) (e) | 5. | (a) (b) (c) (d) (e) |
| 6. | (a) (b) (c) (d) (e) | 7. | (a) (b) (c) (d) (e) | 8. | (a) (b) (c) (d) (e) | 9. | (a) (b) (c) (d) (e) | 10. | (a) (b) (c) (d) (e) |
| 11. | (a) (b) (c) (d) (e) | 12. | (a) (b) (c) (d) (e) | 13. | (a) (b) (c) (d) (e) | 14. | (a) (b) (c) (d) (e) | 15. | (a) (b) (c) (d) (e) |
| 16. | (a) (b) (c) (d) (e) | 17. | (a) (b) (c) (d) (e) | 18. | (a) (b) (c) (d) (e) | 19. | (a) (b) (c) (d) (e) | 20. | (a) (b) (c) (d) (e) |
| 21. | (a) (b) (c) (d) (e) | 22. | (a) (b) (c) (d) (e) | 23. | (a) (b) (c) (d) (e) | 24. | (a) (b) (c) (d) (e) | 25. | (a) (b) (c) (d) (e) |
| 26. | (a) (b) (c) (d) (e) | 27. | (a) (b) (c) (d) (e) | 28. | (a) (b) (c) (d) (e) | 29. | (a) (b) (c) (d) (e) | 30. | (a) (b) (c) (d) (e) |
| 31. | (a) (b) (c) (d) (e) | 32. | (a) (b) (c) (d) (e) | 33. | (a) (b) (c) (d) (e) | 34. | (a) (b) (c) (d) (e) | 35. | (a) (b) (c) (d) (e) |
| 36. | (a) (b) (c) (d) (e) | 37. | (a) (b) (c) (d) (e) | 38. | (a) (b) (c) (d) (e) | 39. | (a) (b) (c) (d) (e) | 40. | (a) (b) (c) (d) (e) |
| 41. | (a) (b) (c) (d) (e) | 42. | (a) (b) (c) (d) (e) | 43. | (a) (b) (c) (d) (e) | 44. | (a) (b) (c) (d) (e) | 45. | (a) (b) (c) (d) (e) |
| 46. | (a) (b) (c) (d) (e) | 47. | (a) (b) (c) (d) (e) | 48. | (a) (b) (c) (d) (e) | 49. | (a) (b) (c) (d) (e) | 50. | (a) (b) (c) (d) (e) |
| 51. | (a) (b) (c) (d) (e) | 52. | (a) (b) (c) (d) (e) | 53. | (a) (b) (c) (d) (e) | 54. | (a) (b) (c) (d) (e) | 55. | (a) (b) (c) (d) (e) |
| 56. | (a) (b) (c) (d) (e) | 57. | (a) (b) (c) (d) (e) | 58. | (a) (b) (c) (d) (e) | 59. | (a) (b) (c) (d) (e) | 60. | (a) (b) (c) (d) (e) |
| 61. | (a) (b) (c) (d) (e) | 62. | (a) (b) (c) (d) (e) | 63. | (a) (b) (c) (d) (e) | 64. | (a) (b) (c) (d) (e) | 65. | (a) (b) (c) (d) (e) |
| 66. | (a) (b) (c) (d) (e) | 67. | (a) (b) (c) (d) (e) | 68. | (a) (b) (c) (d) (e) | 69. | (a) (b) (c) (d) (e) | 70. | (a) (b) (c) (d) (e) |
| 71. | (a) (b) (c) (d) (e) | 72. | (a) (b) (c) (d) (e) | 73. | (a) (b) (c) (d) (e) | 74. | (a) (b) (c) (d) (e) | 75. | (a) (b) (c) (d) (e) |
| 76. | (a) (b) (c) (d) (e) | 77. | (a) (b) (c) (d) (e) | 78. | (a) (b) (c) (d) (e) | 79. | (a) (b) (c) (d) (e) | 80. | (a) (b) (c) (d) (e) |
| 81. | (a) (b) (c) (d) (e) | 82. | (a) (b) (c) (d) (e) | 83. | (a) (b) (c) (d) (e) | 84. | (a) (b) (c) (d) (e) | 85. | (a) (b) (c) (d) (e) |
| 86. | (a) (b) (c) (d) (e) | 87. | (a) (b) (c) (d) (e) | 88. | (a) (b) (c) (d) (e) | 89. | (a) (b) (c) (d) (e) | 90. | (a) (b) (c) (d) (e) |
| 91. | (a) (b) (c) (d) (e) | 92. | (a) (b) (c) (d) (e) | 93. | (a) (b) (c) (d) (e) | 94. | (a) (b) (c) (d) (e) | 95. | (a) (b) (c) (d) (e) |
| 96. | (a) (b) (c) (d) (e) | 97. | (a) (b) (c) (d) (e) | 98. | (a) (b) (c) (d) (e) | 99. | (a) (b) (c) (d) (e) | 100. | (a) (b) (c) (d) (e) |

Answer Key

1	(e)	11	(d)	21	(b)	31	(b)	41	(b)	51	(b)	61	(b)	71	(b)	81	(b)	91	(a)
2	(d)	12	(b)	22	(c)	32	(d)	42	(e)	52	(a)	62	(c)	72	(c)	82	(e)	92	(e)
3	(c)	13	(b)	23	(a)	33	(c)	43	(b)	53	(e)	63	(b)	73	(b)	83	(c)	93	(a)
4	(d)	14	(d)	24	(d)	34	(a)	44	(a)	54	(c)	64	(d)	74	(c)	84	(e)	94	(b)
5	(a)	15	(b)	25	(a)	35	(c)	45	(d)	55	(b)	65	(c)	75	(d)	85	(e)	95	(c)
6	(d)	16	(b)	26	(d)	36	(e)	46	(e)	56	(d)	66	(b)	76	(b)	86	(d)	96	(e)
7	(b)	17	(b)	27	(e)	37	(a)	47	(e)	57	(e)	67	(e)	77	(a)	87	(a)	97	(d)
8	(a)	18	(d)	28	(c)	38	(a)	48	(b)	58	(a)	68	(c)	78	(a)	88	(b)	98	(b)
9	(e)	19	(b)	29	(b)	39	(c)	49	(b)	59	(d)	69	(a)	79	(b)	89	(a)	99	(d)
10	(d)	20	(e)	30	(a)	40	(b)	50	(e)	60	(a)	70	(c)	80	(c)	90	(a)	100	(c)

Answers & Explanations

1. (e) $\sqrt{?} = \pm 75$
 Squaring on both the sides, we get
 $? = 75 \times 75 = 5625$

2. (d) $\frac{21}{8} \div \frac{7}{72} \times \frac{1}{171} = ?$

or $? = \frac{21}{8} \div \frac{7}{72} \times \frac{1}{171} = \frac{3}{19}$

3. (c) $? = 4\frac{1}{2} + 6\frac{2}{3} + 5\frac{1}{3}$

$= (4 + 6 + 5) + \frac{3 + 4 + 2}{6} = 15 + \frac{9}{6} = 16\frac{1}{2}$

4. (d) $? = 792.02 + 101.32 - 306.76 = 586.58$

5. (a) 300% of 150 = ?% of 600
 or, ? of 600 = 45000 or, ? = 75

6. (d) $34.95 + 240.016 + 23.9800 = 298.946$

7. (b) $48.95 - 32.006 = ?$
 or, ? = $48.95 - 32.006 = 16.944$

8. (a) $3889 + 12.952 - ? = 3854.002$
 or ? = $3889 + 12.952 - 3854.002 = 47.95$

9. (e) $? + 72.64 = 74.64$ or $? = 74.64 - 72.64 = 2.00$

10. (d) $6.25 \div 0.0025 = ?$ or $? = 6.25 \times \frac{1}{0.0025} = 2500$

11. (d) Clearly, $\frac{1}{7} < \frac{1}{\sqrt{7}} < \frac{\sqrt{7}}{7} < \sqrt{7}$

$\Rightarrow \frac{1}{7}$ is the smallest number.

12. (b) Let the sum be ₹ x

Now, $56 = \frac{x \times 8 \times (3 - 2)}{100} \Rightarrow x = ₹ 700$

13. (b) Let the cost price of the machine be ₹ x.

Then, selling price at a profit of 10% = ₹ $\frac{11x}{10}$

And the selling price at a loss of 10% = ₹ $\frac{9x}{10}$

Consequently, we find that

$\left(\frac{11x}{10} - \frac{9x}{10}\right) = 80$

$\Rightarrow \frac{x}{5} = 80 \Rightarrow x = ₹ 400$

14. (d) Let the capacity of the jar be of x bottles.
 since 6 bottles were taken out from jar and 4 bottles of oil poured into it \therefore 2 bottles were taken out
 Therefore, we have

$\Rightarrow \frac{4}{5}x - 2 = \frac{3}{4}x$

$\Rightarrow \frac{4}{5}x - \frac{3}{4}x = 2 \Rightarrow x = 40$

15. (b) Average speed = $\frac{\text{Total distance}}{\text{Total time}}$

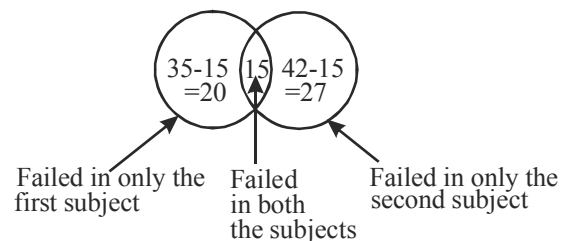
$= \frac{80}{\frac{60}{40} + \frac{20}{20}} = \frac{80}{2.5} = 32 \text{ km/h}$

16. (b) Let the usual speed of the aeroplane be x km/h.

Then, $\frac{1500}{x} - \frac{1}{2} = \frac{1500}{(x + 250)}$

Solving, we get $x = 750 \text{ km/h}$

17. (b) Using Venn Diagram



Thus, percentage of students who passed in both subjects

$= 100 - [(35 - 15) + (42 - 15) + 15] = 100 - (35 + 42 - 15)$
 $= 100 - (62) = 38\%$

and percentage of students who failed in both subject = 15%

Therefore, the percentage of students who passed in either subject = $100 - (38 + 15) = 100 - 53 = 47\%$

Hence, required no. of students who passed in either subject but not in both = $2500 \times \frac{47}{100} = 1175$

18. (d) Let the length and breadth of the rectangle be x and y cm, respectively.
Then, $(x-4)(y+3) = xy \Rightarrow 3x-4y = 12$... (i)
Also, $(x-4) = (y+3)$ [sides of square]
 $\Rightarrow x-y = 7$... (ii)
From (i) and (ii),
 $x = 16$ and $y = 9$

19. (b) Raju's age at the time of marriage = $17 + 3 + 2 + 1 + 3 = 26$ years

20. (e) $5x + 6x + 7x = 180^\circ$
 $\Rightarrow 18x = 180^\circ$
 $\Rightarrow x = \frac{180}{18} = 10$
 \therefore Sum of the smallest and the largest angles = $12x = 12 \times 10 = 120^\circ$

21. (b) $\sqrt{1000} + \frac{3.001}{4.987}$ of $1891.992 = ?$
or $? = 100 + \frac{3}{5}$ of $1900 = 100 + 1140 = 1230$

22. (c) $? = 0.0004 \div 0.0001 \times 36.000009 = 4 \times 36.000009 \approx 154$

23. (a) $? = 137\%$ of $12345 = (100 + 37)\%$ of $12345 \approx 12345 + 4570 \approx 17000$

24. (d) $\therefore 12.25 \times ? \times 21.6 = 3545.64$
 $\therefore ? = \frac{3545.64}{264.6} = 13.4 \approx 13$

25. (a) $? = \sqrt[3]{4096} = \sqrt[3]{16 \times 16 \times 16} = 16$

26. (d) The series is $\times 1 + 1 \times 7, \times 2 + 2 \times 6, \times 3 + 3 \times 5, \dots$

27. (e) The series is $\times 1 + 1^2, \times 2 + 2^2, \times 3 + 3^2, \dots$

28. (c) The series is $\times 1 + 2, \times 2 + 3, \times 3 + 4, \dots$

29. (b) The series is $\times 0.5 + 0.5, \times 1 + 1, \times 1.5 + 1.5, \dots$

30. (a) The series is $\times 2, \times 4, \times 5, \dots$

31. (b) Difference between cost of 1 kg apple and cost of 1 kg guava in 5 cities.
J $160 - 60 = 100$
D $130 - 90 = 40$
C $180 - 120 = 60$
H $90 - 30 = 60$
R $40 - 20 = 20$
 \therefore Cost is second lowest in Delhi.

32. (d) Cost of 1 kg guava in Jalandhar = ₹ 60
Cost of 2 kg grapes in Chandigarh = ₹ $90 \times 2 = ₹ 180$
 $\% = \frac{60}{180} \times 100 = 33.3 \approx 34\%$

33. (c) Cost of 3 kgs apples for Ram = $3 \times 130 = ₹ 390$
Cost of 2 kgs guavas for Ram = $2 \times 90 = ₹ 180$
Total cost that Ram pay = $390 + 180 = ₹ 570$

34. (a) Total cost of 45 kgs grapes from Hoshiarpur = $45 \times 190 = ₹ 8550$
After discount 4% Ravinder paid = $8550 - \frac{8550 \times 4}{100} = ₹ 8208$

35. (c) Cost of 1 kg apples from Ropar :
Cost of 1kg grapes from Chandigarh
 $40 : 90$
 $4 : 9$ or $2^2 : 3^2$

36. (e) As (i) $U > X$ (ii) $T > U$
Hence $T > X$
As $R \geq T$ So $R > X$ Ist follows
As (i) $W > T$ (ii) $T > X$
Combining, we get $W > X$ IInd follows.

37. (a) As (i) $H > G$ (ii) $G \geq I$
Combining, we get $H > I$ Ist follows.
As (i) $G \geq I$ (ii) $G > E$
Combining, we get $E = I$ but $E > I$ not possible.

38. (a) As (i) $A > F$ (ii) $F > C$
So $A > C$ Ist follows

39. (c) As (i) $P \geq O$ (ii) $O \geq N$
So (i) $P = N$ or (ii) $P > N$
(i) $P = N$
As (a) $N = M$ (b) $M \geq L$ (c) $L \geq K$
Combining, we get
(i) $N = K$ (ii) $N > K$
If $N = K$ then $P = K$ IInd follow
If $N > K$ then $P > K$ Ist follow
(ii) Similarly if $P > N$
then also both conclusion can be establish.

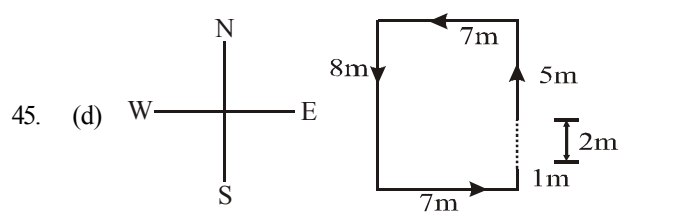
40. (b) As (i) $K > F$ (ii) $F > D$
So $K > D$ IInd follow
As (i) $K > F$ (ii) $G > F$
So $K \leq G$ can't be establish.

41. (b) Series is :
 $09 / 019 / 0129 / 01239 / 012349 / 0123459 / 01234569$

- 42-41: A > B and C
B > D only
E did not pay the minimum amount and paid ₹ 8,000

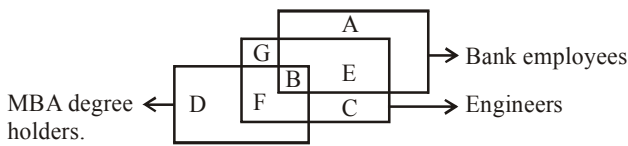
42. (e) A > C & E
only B > D
 $B > D > A > E > C$
 \downarrow
8,000

43. (b) E paid = ₹ 8,000
D paid = $17,000 + 8,000 = 25,000$
Possibly amount paid by A = ₹ 16,000
Because $D > A > E$



45. (d) Coding for:
I D E A S
 $-1\downarrow +1\downarrow -1\downarrow +1\downarrow -1\downarrow$
H E D B R
Coding for:
W O U L D
 $-1\downarrow +1\downarrow -1\downarrow +1\downarrow -1\downarrow$
V P T M C
Similarly,
R I G H T
 $-1\downarrow +1\downarrow -1\downarrow +1\downarrow -1\downarrow$
Q J F I S

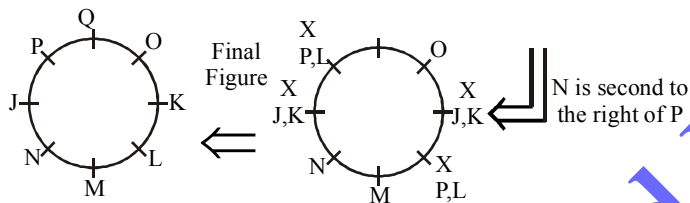
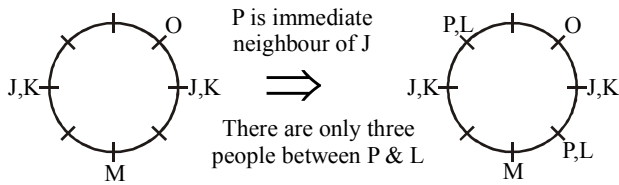
47-50.



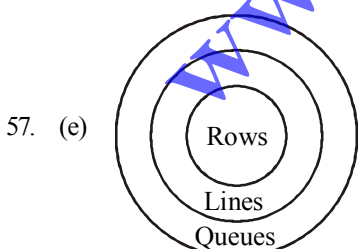
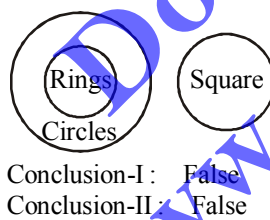
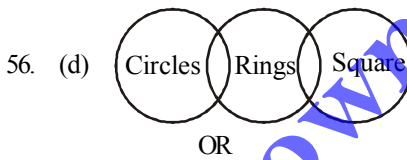
- 47. (e) B is common to all diagram
- 48. (b) Letter D represents only MBA degree holders.
- 49. (b) Letter F represents such engineers who are MBA degree holders but not bank employees.
- 50. (e) Letter C represents only engineers (neither MBA nor bank employees).

(Qs. 51-55).

Formation of fig according to information given

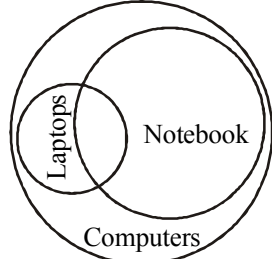
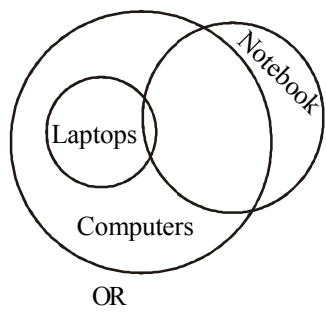


- 51. (b) N is immediate neighbour of J.
- 52. (a) 'K' is second to the left of 'Q' and 'M' is second to the left of 'K'.
- 53. (e) PQ, KL, MN, QO are in clockwise way and KO in anticlockwise way.
- 54. (c) Third to the left.
- 55. (b) Only two persons are sitting i.e. 'O' and 'Q'.



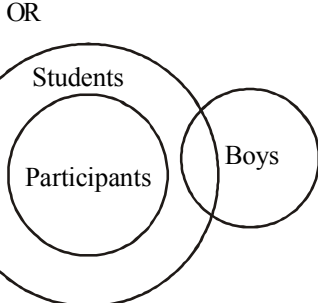
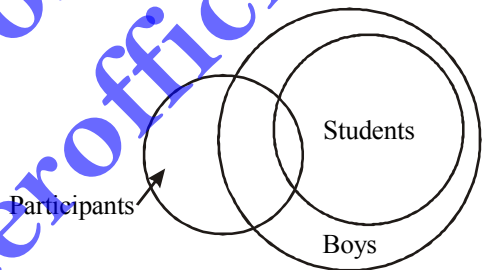
Conclusion-I: True
Conclusion-II: True

58. (a)



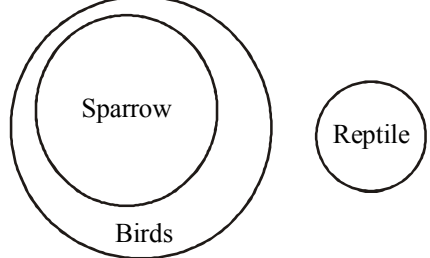
Conclusion-I: True
Conclusion-II: False

59. (d)



Conclusion-I: False
Conclusion-II: False

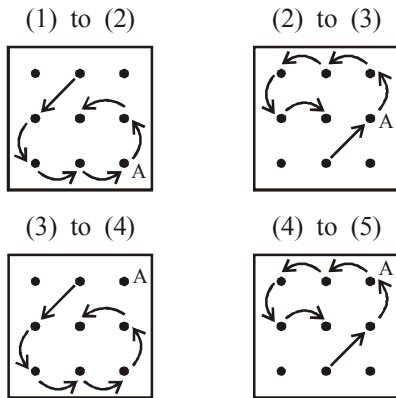
60. (a)



Conclusion-I: True
Conclusion-II: False

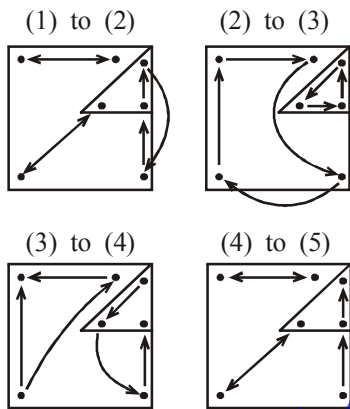
- 61. (b) In each subsequent figure, → design rotates through +90°, +135°, +180°, +225° and so on clock wise. —● design rotate +45°, +90° and so on in the same pair clockwise direction and —■ design rotates — 45° in each step anticlockwise.

62. (c) The movement of designs and other changes in designs can be shown as follows:



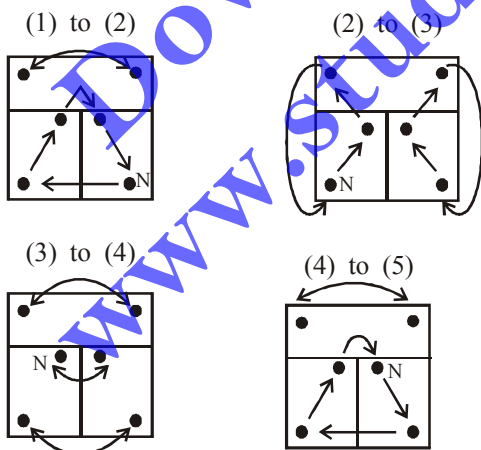
Therefore, similar changes would occur from problem figure (5) to answer figure as that have been occurred from problem figure (1) to (2).

63. (b) The movement of designs and other changes in designs can be shown as follows :



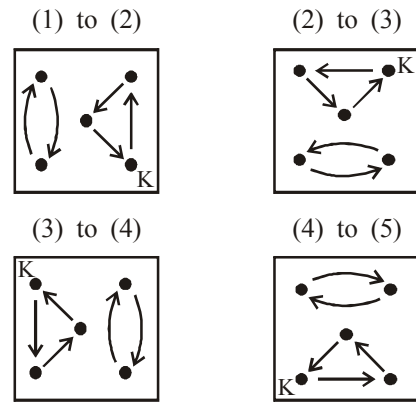
Therefore, similar changes would occur from problem figure (5) to Answer figure as that have been occurred from problem figure (2) to (3).

64. (d) The movement of designs and other changes in designs can be shown as follows :



Therefore, similar changes would occur from problem figure (5) to answer figure as that have been occurred from problem figure (2) to (3).

65. (c) The movement of designs and other changes in designs can be shown as follows:

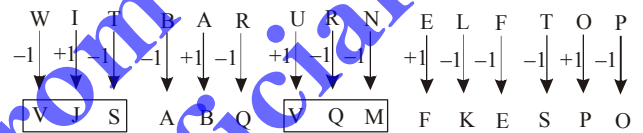


Therefore, similar changes would occur from problem figure (5) to Answer figure as that have been occurred from problem figure (1) to (2).

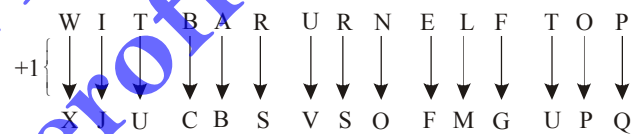
66. (b) After arranging –

ITW, ABR NRU EFLOPT

68. (c)



69. (a)



70. (c) Dictionary order is–

1 2 3 4 5
BAR ELF TOP URN WIT

83. (c) 'Leniency' is not the grammatically correct word to be used. The correct word is lenient and the only answer choice which uses this word is option (c).

84. (e) The sentence is grammatically correct, so no correction is required.

85. (e) The sentence is correct, so no correction is required.

86. (d) None of the other given answer choices fit in correctly as some or the other grammatical error is present. The correct form of sentence would be "The government should launch such projects which should reverse the destructive cycle of flood and drought!"

87. (a) Only the first answer choice fits correctly because the sentence is in the past tense where the action 'that is of setting up the committee' is already over.

88. (b) their 89. (a) sufficient

90. (a) exorbitantly 91. (a) resemblance

93-97. The arrangement ABCDE is correct.

A is the opening sentence of the paragraph as is clear from the options. This is followed by B as B states the results in the Iowa state. This is followed by C which states the reasons for Mr. Huckabee's victory. C is followed by E which is followed by D, as 'will' and 'are expected to be' mentioned in D refer to situation in New Hampshire which is being mentioned in E.

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $1/4^{\text{th}}$ of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-10): What will come in place of the question mark (?) in the following questions ?

- $3 \times ? + 30 = 0$
 (a) -15 (b) 15
 (c) 10 (d) -30
 (e) None of these
- $40.83 \times 1.02 \times 1.2 = ?$
 (a) 49.97592 (b) 41.64660
 (c) 58.7952 (d) 42.479532
 (e) None of these
- $3\frac{1}{3} + 6\frac{3}{7} \times 1\frac{1}{2} \times \frac{22}{7} = ?$
 (a) 4.4 (b) $\frac{22}{7}$
 (c) $\frac{5}{22}$ (d) 40.5
 (e) None of these
- $3978 + 112 \times 2 = ? \div 2$
 (a) 8400 (b) 8406
 (c) 8600 (d) 8404
 (e) None of these
- $(10^{3.7} \times 10^{1.3})^2 = 10^?$
 (a) 6 (b) 7
 (c) 5 (d) 3
 (e) None of these
- $300 + 10^2 \times 2 = ?$
 (a) 450 (b) 800
 (c) 550 (d) 320
 (e) None of these
- $\frac{5 \times 1.6 - 2 \times 1.4}{1.3} = ?$
 (a) 4 (b) 0.4
 (c) 1.4 (d) 1.2
 (e) None of these
- $3\frac{2}{5} + 7\frac{1}{5} - 5\frac{1}{4} = ?$
 (a) $5\frac{3}{10}$ (b) $5\frac{3}{20}$
 (c) $5\frac{7}{10}$ (d) $5\frac{11}{20}$
 (e) None of these
- $25.05 \times 123.95 + 388.999 \times 15.001 = ?$
 (a) 900 (b) 8950
 (c) 8935 (d) 8975
 (e) 8995
- $(15.01)^2 \times \sqrt{730} = ?$
 (a) 6125 (b) 6225
 (c) 6200 (d) 6075
 (e) 6250

11. A boy was asked to write $2^5 \times 9^2$ but he wrote 2592. The numerical difference between the two is:
 (a) 0 (b) 3
 (c) 2 (d) 9
 (e) None of these
12. If the two numbers are respectively 20% and 50% of a third number, what is the percentage of the first number to the second ?
 (a) 10 (b) 20
 (c) 30 (d) 40
 (e) None of these
13. A man gains 10% by selling a certain article for a certain price. If he sells it at double the price, then the profit made is:
 (a) 120% (b) 60%
 (c) 100% (d) 80%
 (e) None of these
14. A, B and C enter into a partnership with investments of ₹ 3500, ₹ 4500 and ₹ 5500, respectively. In the first six months, profit is ₹ 405. What is A's share in the profit ?
 (a) ₹ 200 (b) ₹ 105
 (c) ₹ 250 (d) ₹ 151
 (e) None of these
15. A tap can fill a cistern in 8 hours and another tap can empty it in 16 hours. If both the taps are opened simultaneously, the time taken (in hours) to fill the cistern will be :
 (a) 8 (b) 10
 (c) 16 (d) 24
 (e) None of these
16. Pipes A and B can fill a tank in 5 and 6 hours, respectively. Pipe C can empty it in 12 hours. The tank is half full. All the three pipes are in operation simultaneously. After how much time, the tank will be full ?
 (a) $3\frac{9}{17}$ h (b) 11 h
 (c) $2\frac{8}{11}$ h (d) $1\frac{13}{17}$ h
 (e) None of these
17. If the sum of the digits of an even number is divisible by 9, then that number is always divisible by :
 (a) 24 (b) 12
 (c) 18 (d) 27
 (e) None of these
18. A water tank in the form of a cuboid has its base 20 m long, 7 m wide and 10 m deep. Initially, the tank is full but later when water is taken out of it, the level of water in the tank reduces by 2 m. The volume of water left in the tank is :
 (a) 1120m^3 (b) 400m^3
 (c) 280m^3 (d) 140m^3
 (e) None of these
19. The area of a circular plot is twice the area of a rectangular plot. If the area of the rectangular plot is 11088 sq. metres., what is the perimeter of the circular plot?
 (a) 484 metres (b) 572 metres
 (c) 528 metres (d) 440 metres
 (e) None of these
20. The sum of the two digits of a two-digit number and the difference between the two digits of the two-digit number is 8. What is the two digit number?
 (a) 80 (b) 88
 (c) 44 (d) Cannot be determined
 (e) None of these
21. The total number of students studying in a college is 4220. If the number of girls studying in the college is 2420, what is the respective ratio of the number of boys to the number of girls studying in the college?
 (a) 90 : 131 (b) 90 : 121
 (c) 121 : 70 (d) 121 : 80
 (e) None of these
22. The cost of 14 kgs. of rice is ₹ 672, the cost of 12 kgs. of wheat is ₹ 432 and the cost of 18 kgs. of sugar is ₹ 504. What is the total cost of 20 kgs. of rice, 15 kgs. of wheat and 16 kgs. of sugar?
 (a) ₹ 1,898 (b) ₹ 1,948
 (c) ₹ 2,020 (d) ₹ 1,964
 (e) None of these
23. If the length of a rectangular field is increased by 20% and the breadth is reduced by 20%, the area of the rectangle will be 192m^2 . What is the area of the original rectangle?
 (a) 184m^2 (b) 196m^2
 (c) 204m^2 (d) 225m^2
 (e) None of these
24. The product of one-third of a number and 150% of another number is what per cent of the product of the original numbers?
 (a) 80% (b) 50%
 (c) 75% (d) 120%
 (e) None of these
25. Inside a square plot, a circular garden is developed which exactly fits in the square plot and the diameter of the garden is equal to the side of the square plot which is 28 metres. What is the area of the space left out in the square plot after developing the garden?
 (a) 98m^2 (b) 146m^2
 (c) 84m^2 (d) 168m^2
 (e) None of these

DIRECTIONS (Qs. 26-30) : Find the next term in the given series in each of the questions below.

26. 41, 31, ?, 17, 11, 5
 (a) 19 (b) 21
 (c) 23 (d) 27
 (e) None of these
27. 8, 15, 28, 53, ?
 (a) 106 (b) 98
 (c) 100 (d) 102
 (e) None of these

28. 24, 49, ?, 94, 15, 31, 59, 58
 (a) 51 (b) 63
 (c) 77 (d) 95
 (e) None of these
29. 5, 10, 13, 26, 29, 58, ?, 122
 (a) 60 (b) 61
 (c) 111 (d) 91
 (e) None of these
30. 2, 3, 10, 15, 26, ?, 55
 (a) 32 (b) 33
 (c) 34 (d) 35
 (e) None of these

DIRECTIONS (Qs. 31-35) : What approximate value should come in place of the question mark (?) in the following questions? (You are not expected to calculate the exact value).

31. $\sqrt[3]{860000} = ?$
 (a) 75 (b) 80
 (c) 110 (d) 125
 (e) 95
32. $1\frac{5}{8} + 5\frac{1}{3} + 2\frac{2}{5} = ?$
 (a) 15 (b) 4
 (c) 19 (d) 9
 (e) 21
33. $8769 \div 82 \div 4 = ?$
 (a) 27 (b) 44
 (c) 429 (d) 12
 (e) 512
34. $? \% \text{ of } 45.999 \times 16\% \text{ of } 83.006 = 116.073$
 (a) 6 (b) 24
 (c) 19 (d) 30
 (e) 11
35. $12.998 \times 27.059 \times 17.999 = ?$
 (a) 6020 (b) 6320
 (c) 6800 (d) 6540
 (e) 6150

REASONING ABILITY

DIRECTIONS (Qs. 36-40) : In each question below are two/three statements followed by two conclusions numbered I and II. You have to take the two/three given statements to be true even if they seem to be at variance from commonly known facts and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

Give answer (a) if **only** conclusion I follows.

Give answer (b) if **only** conclusion II follows.

Give answer (c) if **either** conclusion I or conclusion II follows.

Give answer (d) if **neither** conclusion I nor conclusion II follows.

Give answer (e) if **both** conclusion I and conclusion II follow.

36. **Statements** : All kites are birds. All aeroplanes are kites.
 No bird is a fish.

Conclusions : I. No fish is a kite.

II. All aeroplanes are birds.

37. **Statements** : Some wires are fires. All fires are tyres.

Conclusions : I. Atleast some tyres are wires.

II. Some fires are definitely not wires.

38. **Statements** : No clip is a pin. All badges are pins.

Conclusions : I. No badge is a clip.

II. All pins are badges.

39. **Statements** : No colour is a paint. No paint is a brush.

Conclusions : I. No colour is a brush.

II. All brushes are colours.

40. **Statements** : All stars are planets. All planets are galaxies.

Conclusions : I. All galaxies are planets.

II. All stars are galaxies.

DIRECTIONS (Qs. 41-45) : Study the following arrangement carefully and answer the questions given below :

B U B D C E D B D E U B A D C B E A C D A E
 B A U A C D B C A C

41. How many such pairs of alphabets are there in the series of alphabets given in BOLD (A to E) in the above arrangement each of which has as many letters between them (in both forward and backward directions) as they have between them in the English alphabetical series ?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
42. Which of the following is the eighth to the left of the twentieth from the left end of the above arrangement ?
 (a) C (b) E
 (c) U (d) B
 (e) A
43. How many meaningful words can be formed with the alphabets which are first, second, fifth and sixth from the left end of the above arrangement ?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
44. How many such consonants are there in the above arrangement each of which is immediately preceded by a vowel and also immediately followed by a consonant ?
 (a) One (b) Two
 (c) Three (d) Four
 (e) More than Four
45. If all 'a's are dropped from the above arrangement, which of the following will be eleventh from the right end of the above arrangement ?
 (a) E (b) C
 (c) D (d) U
 (e) None of these

DIRECTIONS (Qs. 46-50) : Study the following information to answer the given questions :

Eight people are sitting in two parallel rows containing four people each, in such a way that there is an equal distance between

adjacent persons. In row-1 P, Q, R and S are seated (but not necessarily in the same order) and all of them are facing south. In row-2 A, B, C and D are seated (but not necessarily in the same order) and all of them are facing north. Therefore, in the given seating arrangement each member seated in a row faces another member of the other row.

R sits second to the right of P. A is an immediate neighbour of the person who faces R. Q sits second to left of the person who faces A. Only one person sits between B and C. C does not face P. C does not sit at any of the extreme ends of the line.

46. Four of the following five are alike in a certain way based on the given seating arrangement and thus form a group. Which is the one that does not belong to that group ?
 (a) A (b) P
 (c) R (d) B
 (e) S
47. Who amongst the following faces B ?
 (a) P (b) Q
 (c) R (d) S
 (e) Cannot be determined
48. Which of the following is true regarding S ?
 (a) S sits exactly between R and P
 (b) S sits second to left of Q
 (c) P is an immediate neighbour of S
 (d) D is an immediate neighbour of the person who faces S
 (e) None is true
49. Who amongst the following faces Q ?
 (a) A (b) B
 (c) C (d) D
 (e) Cannot be determined
50. Who amongst the following faces the person who sits exactly between B and C ?
 (a) P (b) Q
 (c) R (d) S
 (e) Cannot be determined

DIRECTIONS (Qs. 51-55): In each question below is given a group of letters followed by four combinations of digits/symbols numbered (a), (b), (c) and (d). You have to find out which of the combinations correctly represents the group of letters based on the coding system and the conditions given below and mark the number of that combination as your answer. If none of the combinations correctly represents the group of letters, mark (e) i.e. 'None of these' as your answer.

Letters	P	M	A	E	J	K	D	R	W	H	I	U	T	F
Digits/symbols	4	\$	1	2	3	#	5	@	©	6	%	δ	7	9
Conditions														

- (i) If the first letter is a consonant and the last letter is a vowel, the codes of both these are to be interchanged.

- (ii) If both the first and the last letters are consonants both these are to be coded as per the code of the last letter.
 (iii) If the first letter is vowel and the last letter is a consonant both these are to be coded as ' '

Note: All the remaining letters are to be coded as per their original codes.

51. ERWHKA
 (a) 2@©6#1 (b) 1@@6#2 (c) 1@©6#I
 (d) 2@©6#2 (e) None of these
52. MPEKDU
 (a) \$42#5δ (b) \$42#5\$ (c) δ42#5δ
 (d) δ425#\$ (e) None of these
53. TMEIUF
 (a) 7\$2%δ9 (b) 7\$2%δ7 (c) 9\$2%δ7
 (d) 9\$2%δ9 (e) None of these
54. JTAERI
 (a) %712@3 (b) 3712@3 (c) 712@
 (d) %712@% (e) None of these
55. UKTMIH
 (a) #7\$%6 (b) 6#7\$%δ (c) #7\$%
 (d) 7#\$%6 (e) None of these
56. In a certain code GRANT is written as UOBSh and PRIDE is written as FEJSQ, How is SOLD written in that code?
 (a) EPMT (b) TPME
 (c) EMPT (d) CKNR
 (e) ETPM
57. Four of the following five are alike in a certain way and so form a group. Which is the one that does not belong to that group?
 (a) 19 (b) 17
 (c) 13 (d) 27
 (e) 37
58. How many meaningful English words can be made with the second, the fourth, the sixth and the seventh letters of the word STUMBLE using each letter only once in each word?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
59. What should come in place of the question mark (?) in the following letter series based on the English alphabetical order?
 BE GJ LO QT ?
 (a) UX (b) VY
 (c) SV (d) RU
 (e) WZ
60. How many such pairs of letters are there in the word GOVERNMENT each of which has as many letters between them in the word (in both forward and backward directions) as in the English alphabet?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three

DIRECTIONS (Qs. 61-65) : In the following questions, the symbols δ , %, \$, # and @ are used with the following meaning as illustrated below:

- 'P \$ Q' means 'P is not smaller than Q'.
- 'P @ Q' means 'P is not greater than Q'.
- 'P δ Q' means 'P is neither smaller than nor equal to Q'.
- 'P # Q' means 'P is neither greater than nor equal to Q'.
- 'P % Q' means 'P is neither smaller than nor greater than Q'.

Now in each of the following questions assuming the given statements to be true, find which of the two conclusions I and II given below them is/are **definitely true**?

Give answer

- (a) if only Conclusion I is true.
- (b) if only Conclusion II is true.
- (c) if either Conclusion I or II is true.
- (d) if neither Conclusion I nor II is true.
- (e) if both Conclusions I and II are true.

61. **Statements:** F @ N, N δ R, H @ R

- Conclusions:** I. H δ N
- II. F # R

62. **Statements:** M # T, T @ K, K \$ N

- Conclusions:** I. M # N
- II. K δ M

63. **Statements:** T % H, H \$ W

- Conclusions:** I. W # T
- II. W % T

64. **Statements:** N δ K, K # D, D % M

- Conclusions:** I. M δ K
- II. D δ N

65. **Statements:** J \$ B, B % R, R δ F

- Conclusions:** I. F # B
- II. R @ J

DIRECTIONS (Qs. 66-70) : In each of the questions given below which one of the five answer figures on the right should come after the problem figures on the left, if the sequence were continued?

66. **Problem Figures**

1 2 T P I V J 3 4	1 2 P T A J V 3 4	1 2 J V S P T 3 4	V J B T P 2 I A 5	B T P D V J I A 5
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Answer Figures

B D V J H T P A 5	B D P T I J V A 5	B D P T D J V A 5	B D P T F J V A 5	B D V J H P T A 5
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- (a) (b) (c) (d) (e)

67. **Problem Figures**

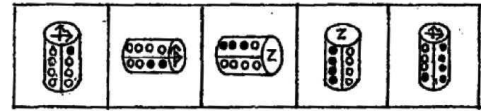
B P 2 P R S q S E P 2 3 q S E	L R 3 B L E B R L B L 4 L R +	5 C 4 C C + 5 C 4 C R C B C C
-------------------------------	-------------------------------	-------------------------------

Answer Figures

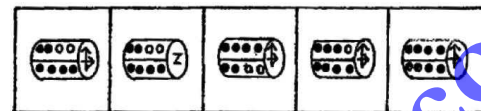
L 9 3 P 2 3 S R 3 2 9 3 S R 3	R S 4 J C R 9 L + 9 J 4 q L 4	B 5 C B C + B 5 C B 5 C B 5 C
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- (a) (b) (c) (d) (e)

68. **Problem Figures**

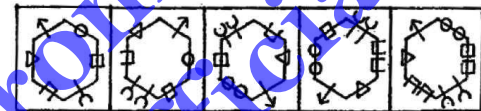


Answer Figures

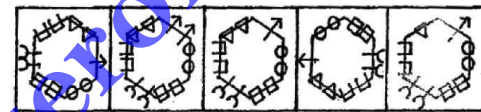


- (a) (b) (c) (d) (e)

69. **Problem Figures**



Answer Figures



- (a) (b) (c) (d) (e)

70. **Problem Figures**



Answer Figures



- (a) (b) (c) (d) (e)

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-75) : Read the following passage carefully and answer the questions given below it.

In a disarmingly frank talk at the Indian Merchants' Chamber in Mumbai, the Japanese Ambassador in India dwelt at length on issues that exercise the minds of Japanese investors when they consider investment proposals in India.

Raising the question "What comparative advantages does India offer as an investment market?", he said though labour in India is expensive, wage-levels are offset by productivity level to a large extent.

Acknowledging that the vastness of the Indian market is a great inducement for investment in manufacturing industry, he wondered if it was justifiable to provide that overseas remittance of profit in foreign exchange be fully covered by exchange earnings which had been done. Significantly, on the eve of the Prime Minister's visit to Japan, the government delinked profits repatriation from exports in meeting this demand.

The Ambassador said that foreign investors needed to be assured of the continuity and consistency of the liberalisation policy and the fact that new measures which had been put into force by means of administrative notifications without amending government laws acted as a damper.

The Ambassador pleaded for speedy formulation of the exit policy and pointed to the highly restrictive control by the government on disinvestment by foreign partners in joint ventures in India.

While it is all too easy to dismiss critical comment on conditions in India contemptuously, there can be little doubt that if foreign investment is to be wooed assiduously, we will have to meet exacting international standards and cater at least partially to what we may consider the idiosyncrasies of our foreign collaborators. The Japanese too have passed through a stage in the fifties when their products were derided as sub-standard and shoddy. That they have come out of that ordeal of fire to emerge as an economic superpower speaks much of their doggedness to pursue goals against all odds to meet acceptable standards.

There is no gainsaying that the past record of Japanese investment is a poor benchmark for future expectations.

71. The author has appreciated the Japanese for their
- quality of products manufactured in the fifties.
 - passing through an ordeal.
 - perseverance in raising quality of products.
 - future expectations.
 - None of these
72. According to the Japanese Ambassador, which of the following motivates the foreign investors to invest in Indian manufacturing industry?
- very large scope of Indian market
 - overseas remittance of profit in foreign exchange
 - assurance of continuity of the liberalisation policy
 - high productivity levels
 - None of these
73. The purpose of the author in writing this passage seems to be to
- discourage foreign investment in India.
 - critically examine Indian investment environment.
 - paint a rosy picture of India's trade and commerce.
 - criticize government's liberalization policy.
 - raise the expectations of foreign investors.
74. According to the Japanese Ambassador, India offers a comparative advantage to foreign investors in terms of
- inexpensive labour
 - abysmally low wage levels
 - higher productivity
 - skilled workforce
 - None of these
75. For seeking more and more foreign investment, the author suggests that we should
- satisfy fully the whims of our foreign collaborators.
 - dismiss all critical comments on Indian conditions.
 - link profit repatriations to exports.
 - raise the quality of product to match international standards.
 - None of these

DIRECTIONS (Qs. 76-83): In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

Trust is the basis of human relationships. As trust between people grows, 76 change and interpersonal dynamics are transformed. Diverse skills and abilities become 77 and appreciated as strengths. People begin to 78 one another's attitudes and feelings. They learn to be 79 instead of playing roles. As trust grows the barriers that prevent 80 and openness lessen. People become more expressive, impulsive, frank and spontaneous. Their communication is efficient and clear. They risk 81 and confrontation, opening the doors to deeper communication, involvement and commitment. Congestion and 82 lessen. The flow of data is open and 83.

76. (a) motivations (b) behaviours
(c) patterns (d) aspirations
(e) commitments
77. (a) obvious (b) necessary
(c) essential (d) recognised
(e) prominent
78. (a) accept (b) participate
(c) pronounce (d) inculcate
(e) relate
79. (a) advocates (b) possessed
(c) exponents (d) indifferent
(e) themselves
80. (a) snobbery (b) egoism
(c) brashness (d) boasting
(e) candour
81. (a) conflict (b) persuasiveness
(c) dedication (d) propensity
(e) jealousy
82. (a) pervasiveness (b) boundaries
(c) sluggishness (d) blocking
(e) enthusiasm
83. (a) unanimous (b) uncritical
(c) uninhabited (d) uncanny
(e) unusual

DIRECTIONS (Qs. 84-88) : In each of the following sentences, an idiomatic expression or a proverb is highlighted. Select the alternative which best describes its use in the sentence.

84. He has built a big business empire by his **sharp practices**.
 (a) extreme hard work
 (b) keen business skills
 (c) dishonest dealings
 (d) sharp intelligence
 (e) None of these
85. The secretary and the treasurer are **hand in glove** with each other.
 (a) very good friends
 (b) constantly fighting
 (c) associates in some action
 (d) suspicious of each other
 (e) None of these
86. He never liked the idea of keeping his wife **under his thumb** and so he let her do what she liked.
 (a) pressed down
 (b) unduly under control
 (c) below his thumb
 (d) under tyrannical conditions.
 (e) None of these
87. It is time that professors came down from their **ivory towers** and studied the real needs of the students.
 (a) detachment and seclusion
 (b) a tower made of ivory
 (c) prison
 (d) dream lands
 (e) None of these
88. You have to be a **cool customer** and be patient if you want to get the best buys.
 (a) be calm and not be excitable
 (b) have a cool head
 (c) be uncommunicative
 (d) be choosy
 (e) None of these

DIRECTIONS (Qs. 89-91) : Look at the bold part of each sentence. Below each sentence are given four possible substitutions for the bold part. If one of them (a), (b), (c) or (d) is better than the bold part, indicate your response on the Answer Sheet against the corresponding letter (a), (b), (c) or (d). If none of the substitutions improves the sentence, indicate (e) as your response on the Answer Sheet. Thus a 'No' improvement' response will be signified by the letter (e).

Errors may be in grammar, appropriate word usage or idioms. There may be a necessary word missing or there may be a word which should be removed.

89. He does not smoke, **nor he drinks**.
 (a) nor he does drink (b) neither he does drink
 (c) nor does he drink (d) but drinks
 (e) No improvement

90. The patient **could have been saved** if he had been taken to the hospital in time.
 (a) could be saved (b) could save
 (c) had been saved (d) can saved
 (e) No improvement
91. I must speak to the landlord about the people above. They make **much noise**.
 (a) much of noise (b) very much noise
 (c) too much noise (d) So much noise
 (e) No improvement

DIRECTIONS (Qs. 92-94) : In each questions below a sentence with four words printed in bold type is given. These are numbered as (a), (b), (c) or (d). One of these four boldly printed words may be either *wrongly spelt* or *inappropriate* in the context of the sentence. Find out the word which is wrongly spelt or inappropriate, if any. The letter of that word is your answer. If all the boldly printed words are correctly spelt and also appropriate in the context of the sentence, mark (e), i.e. 'All correct', as your answer.

92. It is indeed **recommendable** (a) that the apex court has **deemed** (b) it necessary to remind the government of its duties in **promoting** (c) education and **investing** (d) in it. **All correct** (e)
93. The **perception** (a) of animal life was even more **ambiguous** (b) because of **anthropomorphic** (c) **characterisations** (d) of animal behaviour. **All correct** (e).
94. Policy of **permitting** (a) **legal** (b) import of gold has **stimulated** (c) its **consumation** (d). **All correct** (e)
95. His **continually** (a) **defending** (b) his stand on the issue has **risen** (c) **doubts** (d) in the mind of the jury. **All correct** (e).

DIRECTIONS (Qs. 96-100): Rearrange the following sentences (A), (B), (C), (D) and (E) in the proper sequence to form a meaningful paragraph, then answer the questions given below them.

- A. It will take extraordinary political commitment and liberal public funding during the 11th Plan for affordable housing to become a credible goal.
- B. The National Urban Housing and Habitat Policy of the United Progressive Alliance Government seeks to make access to housing, long acknowledged as a fundamental right, a reality for all.
- C. The task is staggering even if we go by conservative estimates.
- D. The housing shortage to be met during the Plan is 26.53 million units, which include the backlog from the 10th Plan.
- E. If the existing stock of poor quality dwellings and the growing urbanization-driven demand are taken into account, the real deficit will be even higher.
96. Which of the following should be the **FIRST** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E

97. Which of the following should be the **SECOND** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E
98. Which of the following should be the **THIRD** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E
99. Which of the following should be the **FOURTH** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E
100. Which of the following should be the **FIFTH (LAST)** sentence?
 (a) A (b) B
 (c) C (d) D
 (e) E

RESPONSE SHEET

- | | | | | |
|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|
| 1. (a) (b) (c) (d) (e) | 2. (a) (b) (c) (d) (e) | 3. (a) (b) (c) (d) (e) | 4. (a) (b) (c) (d) (e) | 5. (a) (b) (c) (d) (e) |
| 6. (a) (b) (c) (d) (e) | 7. (a) (b) (c) (d) (e) | 8. (a) (b) (c) (d) (e) | 9. (a) (b) (c) (d) (e) | 10. (a) (b) (c) (d) (e) |
| 11. (a) (b) (c) (d) (e) | 12. (a) (b) (c) (d) (e) | 13. (a) (b) (c) (d) (e) | 14. (a) (b) (c) (d) (e) | 15. (a) (b) (c) (d) (e) |
| 16. (a) (b) (c) (d) (e) | 17. (a) (b) (c) (d) (e) | 18. (a) (b) (c) (d) (e) | 19. (a) (b) (c) (d) (e) | 20. (a) (b) (c) (d) (e) |
| 21. (a) (b) (c) (d) (e) | 22. (a) (b) (c) (d) (e) | 23. (a) (b) (c) (d) (e) | 24. (a) (b) (c) (d) (e) | 25. (a) (b) (c) (d) (e) |
| 26. (a) (b) (c) (d) (e) | 27. (a) (b) (c) (d) (e) | 28. (a) (b) (c) (d) (e) | 29. (a) (b) (c) (d) (e) | 30. (a) (b) (c) (d) (e) |
| 31. (a) (b) (c) (d) (e) | 32. (a) (b) (c) (d) (e) | 33. (a) (b) (c) (d) (e) | 34. (a) (b) (c) (d) (e) | 35. (a) (b) (c) (d) (e) |
| 36. (a) (b) (c) (d) (e) | 37. (a) (b) (c) (d) (e) | 38. (a) (b) (c) (d) (e) | 39. (a) (b) (c) (d) (e) | 40. (a) (b) (c) (d) (e) |
| 41. (a) (b) (c) (d) (e) | 42. (a) (b) (c) (d) (e) | 43. (a) (b) (c) (d) (e) | 44. (a) (b) (c) (d) (e) | 45. (a) (b) (c) (d) (e) |
| 46. (a) (b) (c) (d) (e) | 47. (a) (b) (c) (d) (e) | 48. (a) (b) (c) (d) (e) | 49. (a) (b) (c) (d) (e) | 50. (a) (b) (c) (d) (e) |
| 51. (a) (b) (c) (d) (e) | 52. (a) (b) (c) (d) (e) | 53. (a) (b) (c) (d) (e) | 54. (a) (b) (c) (d) (e) | 55. (a) (b) (c) (d) (e) |
| 56. (a) (b) (c) (d) (e) | 57. (a) (b) (c) (d) (e) | 58. (a) (b) (c) (d) (e) | 59. (a) (b) (c) (d) (e) | 60. (a) (b) (c) (d) (e) |
| 61. (a) (b) (c) (d) (e) | 62. (a) (b) (c) (d) (e) | 63. (a) (b) (c) (d) (e) | 64. (a) (b) (c) (d) (e) | 65. (a) (b) (c) (d) (e) |
| 66. (a) (b) (c) (d) (e) | 67. (a) (b) (c) (d) (e) | 68. (a) (b) (c) (d) (e) | 69. (a) (b) (c) (d) (e) | 70. (a) (b) (c) (d) (e) |
| 71. (a) (b) (c) (d) (e) | 72. (a) (b) (c) (d) (e) | 73. (a) (b) (c) (d) (e) | 74. (a) (b) (c) (d) (e) | 75. (a) (b) (c) (d) (e) |
| 76. (a) (b) (c) (d) (e) | 77. (a) (b) (c) (d) (e) | 78. (a) (b) (c) (d) (e) | 79. (a) (b) (c) (d) (e) | 80. (a) (b) (c) (d) (e) |
| 81. (a) (b) (c) (d) (e) | 82. (a) (b) (c) (d) (e) | 83. (a) (b) (c) (d) (e) | 84. (a) (b) (c) (d) (e) | 85. (a) (b) (c) (d) (e) |
| 86. (a) (b) (c) (d) (e) | 87. (a) (b) (c) (d) (e) | 88. (a) (b) (c) (d) (e) | 89. (a) (b) (c) (d) (e) | 90. (a) (b) (c) (d) (e) |
| 91. (a) (b) (c) (d) (e) | 92. (a) (b) (c) (d) (e) | 93. (a) (b) (c) (d) (e) | 94. (a) (b) (c) (d) (e) | 95. (a) (b) (c) (d) (e) |
| 96. (a) (b) (c) (d) (e) | 97. (a) (b) (c) (d) (e) | 98. (a) (b) (c) (d) (e) | 99. (a) (b) (c) (d) (e) | 100. (a) (b) (c) (d) (e) |

Answer Key

1	(e)	11	(a)	21	(b)	31	(e)	41	(e)	51	(a)	61	(d)	71	(c)	81	(a)	91	(c)
2	(a)	12	(d)	22	(b)	32	(d)	42	(d)	52	(e)	62	(b)	72	(a)	82	(d)	92	(a)
3	(e)	13	(a)	23	(e)	33	(a)	43	(b)	53	(d)	63	(c)	73	(b)	83	(b)	93	(e)
4	(d)	14	(b)	24	(b)	34	(c)	44	(d)	54	(a)	64	(a)	74	(e)	84	(c)	94	(d)
5	(e)	15	(c)	25	(d)	35	(b)	45	(a)	55	(c)	65	(e)	75	(d)	85	(a)	95	(c)
6	(e)	16	(d)	26	(c)	36	(b)	46	(a)	56	(c)	66	(d)	76	(b)	86	(b)	96	(a)
7	(a)	17	(c)	27	(d)	37	(a)	47	(a)	57	(d)	67	(b)	77	(e)	87	(a)	97	(b)
8	(e)	18	(a)	28	(d)	38	(a)	48	(e)	58	(b)	68	(a)	78	(a)	88	(a)	98	(c)
9	(c)	19	(c)	29	(b)	39	(c)	49	(d)	59	(b)	69	(e)	79	(e)	89	(c)	99	(d)
10	(d)	20	(a)	30	(d)	40	(b)	50	(b)	60	(e)	70	(b)	80	(e)	90	(e)	100	(e)

Answers & Explanations

1. (e) $3 \times ? + 30 = 0$

$$\Rightarrow ? = \frac{-30}{3} = -10$$

2. (a) $? = 40.83 \times 1.02 \times 1.2 = 49.97592$

3. (e) $? = 3\frac{1}{3} + 6\frac{3}{7} \times 1\frac{1}{2} \times \frac{22}{7}$

$$= \frac{10}{3} + \frac{45}{7} \times \frac{3}{2} \times \frac{22}{7} = 2.44$$

4. (d) $3978 + 112 \times 2 = ? \div 2$

$$\therefore ? = (3978 + 224) \times 2 = 8404$$

5. (e) $(10^{3.7} \times 10^{1.3})^2 = 10^?$

$$\Rightarrow (10^{3.7+1.3})^2 = 10^? \quad [\because a^b \times a^c = a^{b+c}]$$

$$\therefore 10^? = (10^5)^2 = 10^{5 \times 2} \quad [\because (a^b)^c = a^{bc}] = 10^{10}$$

6. (e) $? = 300 + (100 \times 2) = 300 + 200 = 500$

7. (a) $? = \frac{5 \times 1.6 - 2 \times 1.4}{1.3} = \frac{8 - 2.8}{1.3} = \frac{5.2}{1.3} = 4$

8. (e) $3\frac{2}{5} + 7\frac{1}{5} - 5\frac{1}{4} = (3+7-5) + \left(\frac{2}{5} + \frac{1}{5} - \frac{1}{4}\right) =$

$$5 + \left(\frac{8+4-5}{20}\right) = 5\frac{7}{20}$$

9. (c) $25 \times 124 + 389 \times 15 = 3100 + 5835 = 8935$

10. (d) $(15)^2 \times \sqrt{730} = 225 \times 27 = 6075$

11. (a) $2^5 \times 9^2 = 32 \times 81 = 2592$

$$\therefore \text{Difference} = 2^5 \times 9^2 - 2592$$

$$= 2592 - 2592 = 0$$

Hence, the numerical difference is 0.

12. (d) Let the third number be 100. Then, the first and second

numbers will be 20 and 50, respectively.

$$\text{Required \%} = \frac{20}{50} \times 100 = 40$$

13. (a) Let the cost price of an article be ` 100

$$\text{then, S.P.} = 100 + 10 = ` 110$$

$$\text{If S.P.} = 2 \times 110 = ` 220$$

$$\text{then, profit \%} = \frac{(220 - 100)}{100} \times 100 = 120\%$$

14. (b) Ratio of investment

$$= 3500 : 4500 : 5500 = 35 : 45 : 55 = 7 : 9 : 11$$

Since, Ratio of investment is same as ratio of profit.

$$\therefore \text{Ratio of profit} = 7 : 9 : 11$$

$$\text{Now, profit} = ₹ 405$$

$$\therefore \text{A's share} = \frac{7}{27} \times 405 = ₹ 105$$

15. (c) Part of the tank filled in one hour = $\frac{1}{8} - \frac{1}{16} = \frac{1}{16}$

Hence, the tank will be filled in 16 hours.

16. (d) Part of the tank filled by the three pipes working

$$\text{simultaneously in one hour is} = \frac{1}{5} + \frac{1}{6} - \frac{1}{12} = \frac{17}{60}$$

$$\text{i.e. it takes } \frac{60}{17} \text{ hours to fill up the tank completely.}$$

$$\text{Now, } \frac{1}{2} \text{ of the tank is filled with all the pipes open,}$$

$$\text{simultaneously together in } \frac{60}{17} \times \frac{1}{2} = 1\frac{13}{17} \text{ hours}$$

17. (c) Any even number is given by $2n$ for all $n \in \mathbb{Z}$, where \mathbb{Z} is a set of integers. This is divisible by 9 if it form $9 \times 2n = 18n$, which is divisible by 18.

For example, number 36 is even and sum of digits $(3 + 6)$ is 9, which is divisible by 9. Hence, the number 36 is divisible by 18.

18. (a) Volume of water left in the tank = $\ell \times b \times h$
 $= 20 \times 7 \times (10 - 2) = 1120 \text{ m}^3$

19. (c) $\pi r^2 = 2 \times 11088$

$$\Rightarrow \frac{22}{7} \times r^2 = 2 \times 11088$$

$$\Rightarrow r^2 = \frac{2 \times 11088 \times 7}{22} = 7056$$

$$\therefore r = \sqrt{7056} = 84 \text{ metre}$$

$$\therefore \text{Circumference} = 2\pi r = 2 \times \frac{22}{7} \times 84 = 528 \text{ metre}$$

20. (a) $x + y = 8$

$$\frac{x - y = 8}{2x = 16}$$

$$\Rightarrow x = 8$$

$$\therefore y = 0$$

$$\therefore \text{Two digit number} = 80$$

21. (b) Required ratio
 $= (4220 - 2420) : 2420$
 $= 1800 : 2420$
 $= 90 : 121$

22. (b) C.P. of 20 kg of rice

$$= ₹ \left(\frac{672}{14} \times 20 \right)$$

$$= ₹ 960$$

C.P. of 15 kg of wheat

$$= ₹ \left(\frac{432}{12} \times 15 \right)$$

$$= ₹ 540$$

C.P. of 16 kg of sugar

$$= ₹ \left(\frac{504}{18} \times 16 \right)$$

$$= ₹ 448$$

$$\therefore \text{Total cost price}$$

$$= ₹ (960 + 540 + 448)$$

$$= ₹ 1948$$

23. (e) Let the length and breadth of the original rectangle be 'L' m and 'B' m respectively.

After increasing the length by 20% and decreasing the breadth by 20% area is 192.

$$(1.2L) \times (0.8B) = 192$$

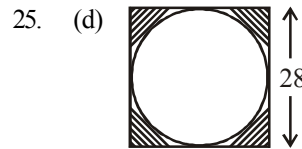
$$\text{or } 0.96LB = 192$$

$$LB = 200$$

24. (b) Let the original numbers be x and y and their product be xy.

$$\text{Product of } \frac{1}{3} \text{rd of } x \text{ and } 150\% \text{ of } y = \frac{x}{3} \times \frac{3}{2} y = \frac{xy}{2}$$

$$\text{Required answer} = \frac{xy}{2 \times xy} \times 100 = 50\%$$



We have to calculate the area of the shaded region which is equal to area of square – Area of the circle

$$\begin{aligned} \text{Required answer} &= (28)^2 - \frac{22}{7} \times 14 \times 14 \\ &= 784 - 616 = 168 \text{ m}^2 \end{aligned}$$

26. (c) This is a series of prime number

27. (d) Let $x = 8$

$$\text{then } 15 = 2x - 1 = y$$

$$28 = 2y - 2 = z$$

$$53 = 2z - 3 = m$$

$$\text{Next term in the pattern should be } 2m - 4 = 2 \times 53 - 4 = 102$$

28. (d) It is a combination of two series, namely

$$24, 49, -94; \text{ and } 15, 31, 59, 58$$

The two series correspond to

$$x, (2x+1), (4x-1), (4x-1), (4x-2)$$

Hence the missing term is

$$4 \times 24 - 1 = 95$$

29. (b) Add 3 after doubling the previous number.

30. (d) The series exhibits the pattern of $n^2 + 1, n^2 - 1$, alternatively, n taking values 1, 2,.....

31. (e) Let x be there in the question mark.

$$\text{So, } \sqrt[3]{860000} = x \Rightarrow x^3 = 860000$$

$$\text{Taking } \log_{10} \text{ on both the sides } 3\log_{10} x = 5.9345$$

$$\log x = 1.9782, \text{ Taking antilog we get } x \approx 95$$

[$\log x$ is nearly 2 so, x will be near to but less than 100]

32. (d) $1\frac{5}{8} + 5\frac{1}{3} + 2\frac{2}{5} = \frac{13}{8} + \frac{16}{3} + \frac{12}{5}$

$$= \frac{15 \times 13 + 40 \times 16 + 12 \times 24}{120} = \frac{195 + 640 + 288}{120}$$

$$= \frac{1123}{120} = 9.35 \approx 9.$$

33. (a) $8769 \div 82 \div 4 = \frac{8769}{4 \times 82} = \frac{8769}{328} = 26.73 \approx 27$

34. (c) Let x be there in place of question mark so, $x\%$ of $45.999 \times 16\%$ of $83.006 = 116.073$.

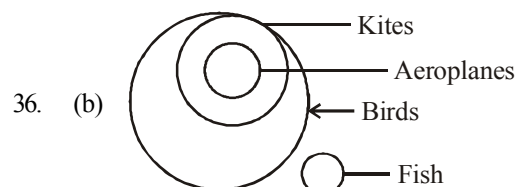
$$\text{We take } \frac{x}{100} \times 46 \times \frac{16}{100} \times 83 = 116$$

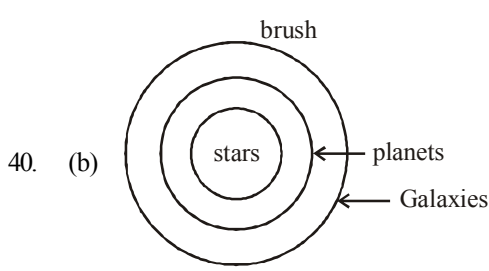
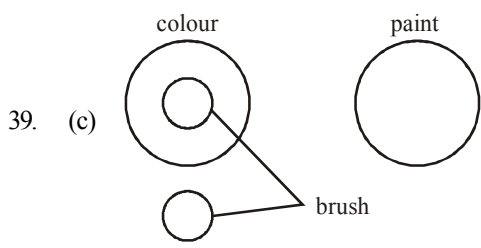
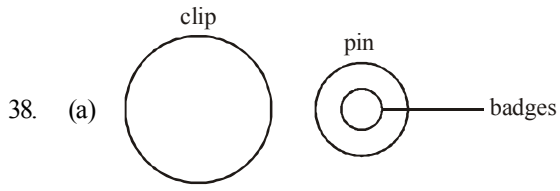
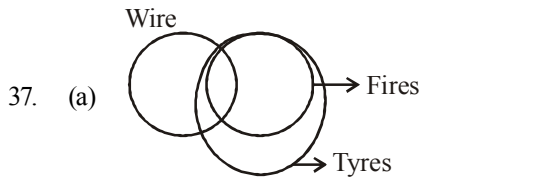
$$x \times 0.46 \times 13.28 = 116$$

$$\text{or } x \times 6.11 = 116$$

$$\Rightarrow x = 18.98 \approx 19.$$

35. (b) $12.998 \times 27.059 \times 17.999$





42. (d) The given arrangement is:

8th to the left of 20th

↓

B U B D C E D B D E U **B** A D

C B E A C **D** A E B A U A C D

20th from the left

↓

43. (b)

B	U	C	E
C	U	B	E

44. (d)

U	B	D
C	E	D
A	D	C
A	C	D

45. (a) E

46-50.

S	R	Q	P
└───┘	└───┘	└───┘	└───┘

A	C	D	B
└───┘	└───┘	└───┘	└───┘

51. (a) Letter series E R W H K A

↓ ↓ ↓ ↓ ↓ ↓

Code 2 @ © 6 # 1

without condition

2	@	©	6	#	1
---	---	---	---	---	---

52. (e) Letter series M P E K D U

↓ ↓ ↓ ↓ ↓ ↓

Code \$ 4 2 # 5 δ

According to condition (i)

δ	4	2	#	5	\$
---	---	---	---	---	----

53. (d) Letter series T M E I U F

↓ ↓ ↓ ↓ ↓ ↓

Code 7 \$ 2 % δ 9

According to condition (ii)

9	\$	2	%	δ	9
---	----	---	---	---	---

54. (a) Letter series J T A E R I

↓ ↓ ↓ ↓ ↓ ↓

Code 3 7 1 2 @ %

According to condition (i)

%	7	1	2	@	3
---	---	---	---	---	---

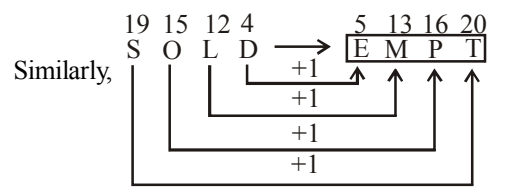
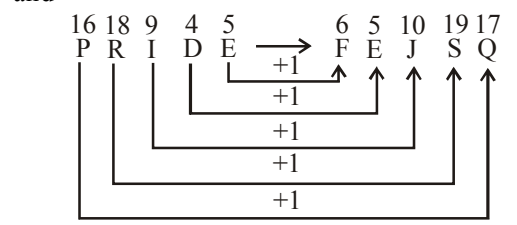
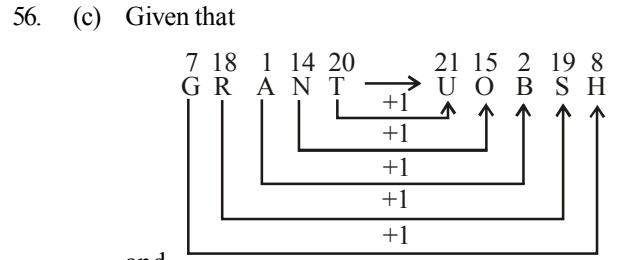
55. (c) Letter series U K T M I H

↓ ↓ ↓ ↓ ↓ ↓

Code δ # 7 \$ % 6

According to condition (iii)

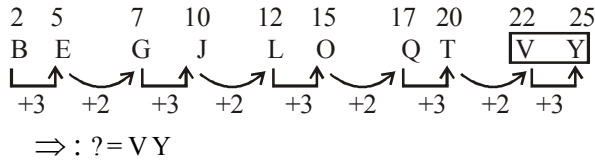
★	#	7	\$	%	★
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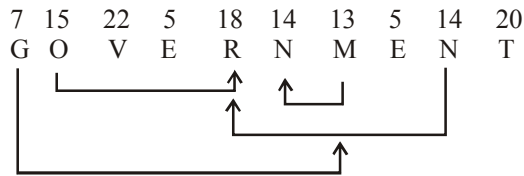
∴ SOLD ⇒ EMPT

57. (d) All others are prime number Except 27.
 58. (b) Second, Fourth, sixth and seventh letters of word "STUMBLE" are T, M, L & E respectively and meaningful word made by then letter is 'MELT'

59. (b) Given letter series:-



60. (e) According to question.



Such couple are G - M, O - R, M - N and N - R and is more than three.

Solution : 61 to 65

- $P \$ Q \Rightarrow P \geq Q$
 $P @ Q \Rightarrow P \leq Q$
 $P \delta Q \Rightarrow P > Q$
 $P \# Q \Rightarrow P < Q$
 $P \% Q \Rightarrow P = Q$

61. (d) Accordingly,

- $F @ N \Rightarrow F \leq N$
 $N \delta R \Rightarrow N > R$
 $H @ R \Rightarrow H \leq R$
 $\therefore F \leq N > R \geq H$

- Conclusion : I.** $H \delta N \Rightarrow H > N$ [not true]
II. $F \# R \Rightarrow F < R$ [not true]

If neither conclusion I nor II is true.

62. (b) Accordingly,

- $M \# T \Rightarrow M < T$
 $T @ K \Rightarrow T \leq K$
 $K \$ N \Rightarrow K \geq N$
 $\therefore M < T \leq K \geq N$

- Conclusion : I.** $M \# N \Rightarrow M < N$ [not true]
II. $K \delta M \Rightarrow K > M$ [not true]

Only conclusion II is true.

63. (c) Accordingly,

- $T \% H \Rightarrow T = H$
 $H \$ W \Rightarrow H \geq W$
 $\therefore T = H \geq W$

- Conclusion : I.** $W \# T \Rightarrow W < T$ [true]
II. $W \% T \Rightarrow W = T$ or

If either conclusion I or II is true. [true]

64. (a) Accordingly,

- $N \delta K \Rightarrow N > K$

- $K \# D \Rightarrow K < D$
 $D \% M \Rightarrow D = M$
 $\therefore N > K < D = M$

- Conclusion : I.** $M \delta K \Rightarrow M > K$ [true]
II. $D \delta N \Rightarrow D > N$ [not true]

Only conclusion I is true.

65. (e) Accordingly,

- $J \$ B \Rightarrow J \geq B$
 $B \% R \Rightarrow B = R$
 $R \delta F \Rightarrow R > F$
 $\therefore J \geq B = R > F$

- Conclusion : I.** $F \# B \Rightarrow F < B$ [true]
II. $R @ J \Rightarrow R \leq J$ [true]

Both conclusion I and II are true.

66. (d) Next figure of each problem figure changes like that the horizontal line shifted to downward and the letters changes their position on either side of vertical lines and middle letter of horizontal line changes by new letter.

68. (a) Next second figure of each problem figure is rotated clockwise by 90° and in next figure of each problem figure one more circle is darken.

69. (e) First right of each problem figure change like : The figures on hexagonal side are rotated clockwise one side and two side respectively and one more same figure added on particular side.

70. (b) Next right figure of each problem figure is rotated anticlockwise clockwise respectively by so and the figure at apex is changes to new Figure.

71. (c) The meaning is implied in the last sentence.

72. (a) The Japanese ambassador acknowledges that the vastness of the Indian market is a great inducement for investment in the manufacturing industry.

73. (b) The author describes the Indian investment scenario in toto. He presents a comparative analysis regarding foreign investment in India.

74. (e) Comparatively though labour is inexpensive in India, but at the same time productivity is not high. Therefore, it cannot be cited as an advantage here.

75. (d) If foreign investment is to be wooed assiduously, we will have to meet exacting international standards.

92. (a) The right word- commendable

94. (d) The right word - consumption

95. (c) It should the 'raised' in place of 'risen'

- 96-100. Clearly C must be followed by D, which must be further followed by the E as E reiterates the housing shortage and says that the real deficit will be even higher. D and E provide the statistical proof of the staggering task mentioned in C. So this leads us to the two options (b) and (a) emphasises what is being said in A. Hence, ABCDE gives the correct arrangement.

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $1/4^{\text{th}}$ of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

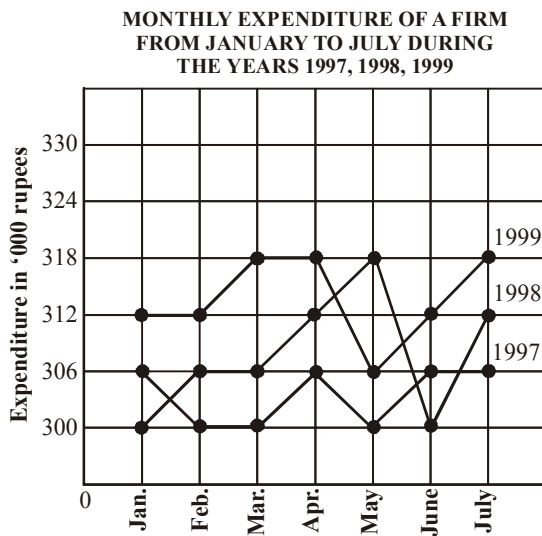
QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-10): What will come in place of the question mark (?) in the following questions ?

- $\frac{5}{8}$ of $\frac{4}{9}$ of $\frac{3}{5}$ of 222 = ?
 (a) 42 (b) 43
 (c) 39 (d) 37
 (e) None of these
- 56% of $450 + ? = 300$
 (a) 52 (b) 48
 (c) 42 (d) 56
 (e) None of these
- $27^{1.5} \times 27^{3.5} = 27^?$
 (a) 5 (b) 7
 (c) 3 (d) 2
 (e) None of these
- $27.06 \times 25 - ? = 600$
 (a) 76.3 (b) 76.7
 (c) 76.5 (d) 76.2
 (e) None of these
- $4\frac{7}{8} \times 2\frac{4}{13} = ?$
 (a) $11\frac{1}{3}$ (b) $11\frac{1}{13}$
 (c) $11\frac{4}{13}$ (d) $11\frac{3}{8}$
 (e) None of these
- $8^4 \times \frac{1}{8^3} \times 8^5 \div 8^2 = 8^?$
 (a) 7 (b) 2
 (c) 3 (d) 4
 (e) None of these
- $-(a - b) \times ? = b - a$
 (a) -1 (b) 1
 (c) -a (d) a
 (e) None of these
- $(a + b) = ? \times (-a - b)$
 (a) 1 (b) -a
 (c) -1 (d) -b
 (e) None of these
- $|? + 14| = 11$
 (a) -3 (b) -25
 (c) 25 (d) 3
 (e) Either -3 or -25
- $16 + 26 \times 2 = ?$
 (a) 84 (b) 44
 (c) 40 (d) 832
 (e) None of these
- Which of the following fractions is the least ?
 (a) $\frac{12}{119}$ (b) $\frac{1}{10}$
 (c) $\frac{4}{39}$ (d) $\frac{7}{69}$
 (e) None of these

12. A number of points are marked on a plane and are connected pairwise by a line segment. If the total number of line segments is 10, how many points are marked on the plane?
 (a) 4 (b) 10
 (c) 5 (d) 9
 (e) None of these
13. A sum of money becomes eight times in 3 years if the rate is compounded annually. In how much time, the same amount at the same compound interest rate will become sixteen times?
 (a) 6 years (b) 4 years
 (c) 8 years (d) 5 years
 (e) None of these
14. A machine is sold at a profit of 10%. Had it been sold for ₹ 40 less, there would have been a loss of 10%. What was the cost price?
 (a) ₹ 320 (b) ₹ 200
 (c) ₹ 225 (d) ₹ 250
 (e) None of these
15. Ram spends ₹ 3620 for buying pants at the rate of ₹ 480 each and shirts at the rate of ₹ 130 each. What will be the ratio of pants to shirts when maximum number of pants are to be bought?
 (a) 7:2 (b) 7:3
 (c) 2:7 (d) 4:5
 (e) None of these
16. Two trains each of 120 m in length, run in opposite directions with a velocity of 40 m/s and 20 m/s respectively. How long will it take for the tail ends of the two trains to meet each other during the course of their journey?
 (a) 20 s (b) 3 s
 (c) 4 s (d) 5 s
 (e) None of these
17. Ramesh is twice as good a workman as Sunil and finishes a piece of work in 3 hours less than Sunil. In how many hours they together could finish the same piece of work?
 (a) $2\frac{1}{3}$ (b) 2
 (c) $1\frac{2}{3}$ (d) 8
 (e) None of these
18. Fifteen years hence, a man will be four times as old as he was fifteen years ago. His present age is:
 (a) 25 years (b) 20 years
 (c) 30 years (d) 45 years
 (e) None of these
19. The floor of a rectangular room is 15 m long and 12 m wide. The room is surrounded by a vrandah of width 2 m on all its sides. The area of the vrandah is:
 (a) 124m^2 (b) 120m^2
 (c) 108m^2 (d) 58m^2
 (e) None of these
20. Pratul's monthly income is one-fourth of Manoj's monthly income. Manoj's annual income is ₹ 2.16 lacs. What is Pratul's annual income? (In some cases monthly income and in some cases annual income are used.)
 (a) ₹ 54,000 (b) ₹ 5.4 thousand
 (c) ₹ 4,500 (d) ₹ 45,000
 (e) None of these
-
- DIRECTIONS (Qs. 21-25): Find the next term in the given series in each of the questions below.**
21. 2, 4, ?, 16, 32
 (a) 6 (b) 10
 (c) 8 (d) 12
 (e) None of these
22. 0, 7, 26, ?, 124, 215
 (a) 37 (b) 51
 (c) 63 (d) 88
 (e) None of these
23. 4, 15, 16, ?, 36, 63, 64
 (a) 25 (b) 30
 (c) 32 (d) 35
 (e) None of these
24. 1, 8, 9, ?, 25, 216, 49
 (a) 60 (b) 64
 (c) 70 (d) 75
 (e) None of these
25. 336, 210, 120, ?, 24, 6, 0
 (a) 40 (b) 50
 (c) 60 (d) 70
 (e) None of these
-
- DIRECTIONS (Qs. 26-30): Find out the approximate value which is closest to the value that should replace the question mark (?) in the following questions. (You are not expected to find out the exact value.)**
26. $\sqrt{1223.9975} = ?$
 (a) 110 (b) 144
 (c) 34 (d) 12.55
 (e) 125
27. $503 \times 201 = ?$
 (a) 101100 (b) 100000
 (c) 110000 (d) 100003
 (e) 1000103
28. $1205 \div 2.5 = ?$
 (a) 3000 (b) 4800
 (c) 300 (d) 480
 (e) 500
29. $22020 \div 0.011 = ?$
 (a) 20020 (b) 2002000
 (c) 200200 (d) 20002
 (e) 2000020
30. $\sqrt{\sqrt{20800}} = ?$
 (a) 12 (b) 120
 (c) 140 (d) 102
 (e) 1020

DIRECTIONS (Qs. 31-35) : Study the data presented in the following graph to answer the questions :



31. What is the total expenditure during the period under review (7 months) in 1997 ?
 (a) ₹ 21, 07, 000 (b) ₹ 96, 07, 000
 (c) ₹ 21, 54, 000 (d) ₹ 21, 24, 000
 (e) None of these
32. What total expenditure has been made during the year 1997 and 1998 in the period covered in the graph ?
 (a) ₹ 24, 87, 000 (b) ₹ 2, 70, 000
 (c) ₹ 48, 27, 000 (d) ₹ 42, 78, 000
 (e) None of these
33. What is the average monthly expenditure during the year 1999 covering the period shown in the graph ?
 (a) ₹ 2, 75, 000 (b) ₹ 2, 70, 000
 (c) ₹ 3, 14, 000 (d) ₹ 2, 47, 000
 (e) None of these
34. Which month has been the least expensive during 1999 ?
 (a) June (b) April (c) May (d) July
 (e) None of these
35. The expenditure in April 1999 was.....higher than that of corresponding period in 1998.
 (a) 1.5% (b) 2% (c) 2.5% (d) 0.94%
 (e) None of these

REASONING ABILITY

DIRECTIONS (Qs. 36-40) : In the following questions, the symbols δ , %, \$, # and @ are used with the following meaning as illustrated below:

- 'P \$ Q' means 'P is not smaller than Q'.
 'P @ Q' means 'P is not greater than Q'.
 'P δ Q' means 'P is neither smaller than nor equal to Q'.
 'P # Q' means 'P is neither greater than nor equal to Q'.
 'P % Q' means 'P is neither smaller than nor greater than Q'.

Now in each of the following questions assuming the given statements to be true, find which of the two conclusions I and II given below them is/are **definitely true**?

Give answer

- (a) if only Conclusion I is true.
 (b) if only Conclusion II is true.
 (c) if either Conclusion I or II is true.

- (d) if neither Conclusion I nor II is true.
 (e) if both Conclusions I and II are true.

36. **Statements:** F @ N, N δ R, H @ R
Conclusions: I. H δ N
 II. F # R
37. **Statements:** M # T, T @ K, K \$ N
Conclusions: I. M # N
 II. K δ M
38. **Statements:** T % H, H \$ W
Conclusions: I. W # T
 II. W % T
39. **Statements:** N δ K, K # D, D % M
Conclusions: I. M δ K
 II. D δ N
40. **Statements:** J \$ B, B % R, R δ F
Conclusions: I. F # B
 II. R @ J

DIRECTIONS (Qs.41-45) : Study the following information carefully and answer the questions given below :

A, B, C, D, E, F and G are sitting around a circle facing the centre, not necessarily in the same order. D is not second to the left of F but D is second to the right of A. C is third to the right of A and C is second to the left of G. B is not an immediate neighbour of G.

41. Who is to the immediate right of C?
 (a) D (b) G
 (c) E (d) B
 (e) Data inadequate
42. Who is the only one person sitting between A and G?
 (a) B (b) D
 (c) C (d) E
 (e) F
43. Who is to the immediate left of D ?
 (a) B (b) C
 (c) A (d) Data inadequate
 (e) None of these
44. Who is second to the left of C?
 (a) B (b) G
 (c) F (d) Data inadequate
 (e) None of these
45. What is E's position with respect to D?
 (a) To the immediate right
 (b) To the immediate left
 (c) Third to the right
 (d) Second to the right
 (e) Third to the left

DIRECTIONS (Qs. 46-50) : Each of the questions below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and Give answer

- (a) if the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question.
- (b) if the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question.
- (c) If the data either in statement I alone or in statement II alone are sufficient to answer the question.
- (d) if the data given in both the statements I and II together are not sufficient to answer the question.
- (e) if the data given in both the statements I and II together are necessary to answer the question.
46. In a row of girls facing North, what is D's position from the left end?
I. D is twentieth from the right end.
II. There are ten girls between Band D.
47. Town M is towards which direction of Town K?
I. Town K is towards North-West of Town D
II. Town M is towards South-East of Town D
48. How many daughters does P have?
I. K and M are sisters of T.
II. T's father is husband of P's mother.
49. On which day of the week from Monday to Sunday did Arun leave for London?
I. Arun did not leave for London during the weekend.
II. Arun's brother left for London on Friday two days after Arun left for London.
50. How is 'new' written in a code language?
I. 'new good clothes' is written as '5 3 9' in that code language.
II. 'good clothes are costly' is written as '9673' in that code language.

Directions (Qs. 51-55) : In each question below are two statements followed by two conclusions numbered I and II. You have to take the two given statements to be true even if they seem to be at variance from commonly known facts and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts. Give answer

- (a) if only conclusion I follows.
- (b) if only conclusion II follows.
- (c) if either conclusion I or II follows.
- (d) if neither conclusion I nor II follows.
- (e) if both conclusions I and II follow.
51. **Statements:** No holiday is a vacation.
 Some vacations are trips.
Conclusions: **I.** No trip is a holiday.
II. Some holidays are definitely not trips.
52. **Statements:** Some kites are birds.
 No kite is an aeroplane.

Conclusions:

- I.** All aeroplanes are birds.
II. Some birds are definitely not kites
53. **Statements:** All metals are plastics.
 All plastics are fibres.
Conclusions: **I.** Atleast some fibres are metals.
II. Some metals are not fibres.
54. **Statements:** All roads are streets.
 No street is a highway.
Conclusions: **I.** No highway is a road.
II. All streets are roads.
55. **Statements:** Some animals are plants.
 All plants are rocks.
Conclusions: **I.** All plants are animals.
II. Atleast some rocks are animals.
56. In a certain code language. 'LISP' is coded as 'MJTQ', similarly 'PLAN' is coded as 'QMBO'. How will 'FORT' be coded in the same code language?
 (a) ENSQ (b) GPUS
 (c) ENQS (d) GPSU
 (e) None of these
57. 'Artificial' is related to 'Natural' in the same way as 'private' is related to _____
 (a) Future (b) Personal
 (c) Public (d) Closed
 (e) Confidential
58. Four of the following five are alike on the basis of being divisible by a particular number and hence form a group. Which of the following **does not** belong to that group ?
 (a) 21 (b) 91
 (c) 65 (d) 77
 (e) 35
59. In a class of 25 students. Lata's rank is 13th from the top and Parul's rank is 19th from the bottom. If Vishal's rank is exactly between Lata's and Parul's rank what is Vishal's rank from the top ?
 (a) 10th (b) 8th
 (c) 9th (d) 7th
 (e) Cannot be determined
60. What should come next in the number series given below ?
 1 1 2 1 2 3 1 2 3 4 1 2 3 4 5 1 2 3 4 5 6 1 2 3 4 5 6
 (a) 5 (b) 2
 (c) 8 (d) 1
 (e) None of these

DIRECTIONS (61 - 65) : Study the following arrangement of consonants, vowels, numbers and symbols carefully and answer the questions given below:

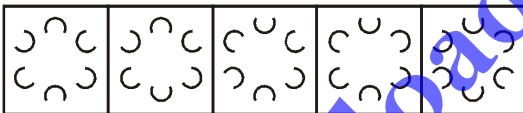
H @ F ! 3 U 6 % G I T * P L 8 \$ ^ 9 S 2 7 & A M K + J
 © D 4 # 5 & E

61. Which of the following is ninth to the right of the twentieth from the right end of the above arrangement ?
 (a) K (b) M
 (c) U (d) A
 (e) None of these

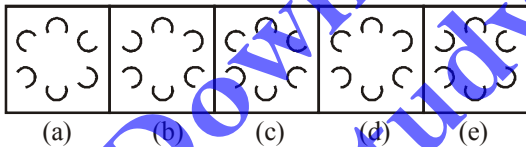
62. How many such consonants are there in the above arrangement, each of which is immediately preceded by a symbol and also immediately followed by a symbol ?
- (a) None (b) One
(c) Two (d) Three
(e) More than three
63. If all the symbols are dropped from the arrangement, which of the following will be the twelfth from the left end ?
- (a) 9 (b) 2
(c) S (d) 7
(e) None of these
64. Four of the following five are alike in a certain way based on their positions in the above arrangement and so form a group. Which is the one that **does not** belong to the group?
- (a) L\$8 (b) AKM
(c) @!F (d) 6%G
(e) JD©
65. What should come in place of the question mark (?) in the following series based on the above arrangement >
- F3U %!T L\$ ^ ?
- (a) 927 (b) 7&A
(c) 7AM (d) 2&A
(e) 27&

DIRECTIONS (Q. 66-70) : In each of the questions given below which one of the five answer figures on the right should come after the problem figures on the left, if the sequence were continued?

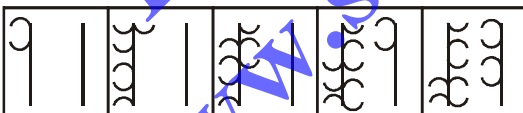
66. Problem figures



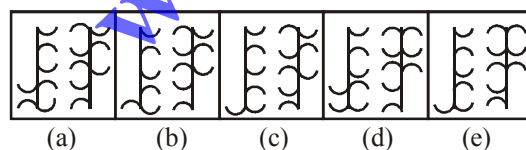
Answer figures



67. Problem figures



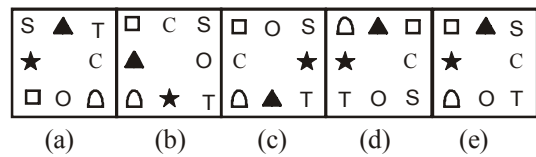
Answer figures



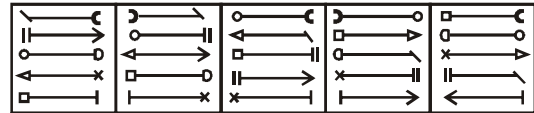
68. Problem figures



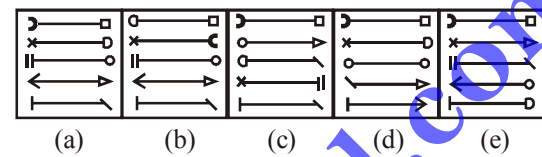
Answer figures



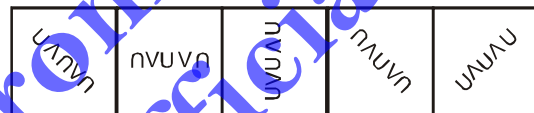
69. Problem figures



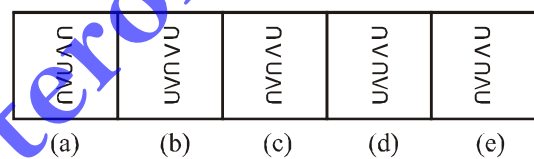
Answer figures



70. Problem figures



Answer figures



ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-76) : Read the following passage and answer the questions given below it. Certain words/phrases are given in **bold** to help you to locate them while answering some of the questions.

We have inherited the tradition of secrecy about the budget from Britain where also the system has been strongly attacked by eminent economists and political scientists including Peter Jay. Sir Richard Clarke, who was the originating genius of nearly every **important** development in the British budgeting techniques during the last two decades, has spoken out about the abuse of budget secrecy: "The problems of long-term tax policy should surely be debated openly with the facts on the table. In my opinion, all governments should have just the same **duty** to publish their expenditure policy. Indeed, this obligation to publish taxation policy is really essential for the control of public expenditure in order to get realistic taxation implications." Realising that democracy **flourishes** best on the principles of open government, more and more democracies are having an open public debate on budget proposals before introducing the appropriate Bill in the legislature. In the United States the budget is conveyed in a message by the President to the Congress, which comes well in advance of the date when the Bill is introduced in

the Congress. In Finland the Parliament and the people are already discussing in June the tentative budget proposals which are to be introduced in the Finnish Parliament in September. Every budget contains a cartload of figures in black and white - but the dark figures represent the **myriad** lights and shades of India's life, the contrasting tones of poverty and wealth, and of bread so dear and flesh and blood so cheap, the deep tints of adventure and enterprise and man's ageless struggle for a brighter morning. The Union budget should not be an annual **scourge** but a part of presentation of annual accounts of a partnership between the Government and the people. That partnership would work much better when the nonsensical secrecy is replaced by openness and public consultations, resulting in fair laws and the people's acceptance of their moral duty to pay.

71. How do the British economists and political scientists react to budget secrecy? They are
- in favour of having a mix of secrecy and openness.
 - indifferent to the budgeting techniques and taxation policies.
 - very critical about maintenance of budget secrecy.
 - advocates of not disclosing in advance the budget contents.
 - None of these
72. The author thinks that openness in budget is essential as it leads to
- prevention of tax implications
 - people's reluctance to accept their moral duties
 - exaggerated revelation of the strengths and weaknesses of economy
 - making our country on par with Finland
 - None of these
73. The author seems to be in favour of
- maintaining secrecy of budget
 - judicious blend of secrecy and openness
 - transparency in budget proposals
 - replacement of public constitution by secrecy
 - None of these
74. The secrecy of the budget is maintained by all of the following countries **except**
- | | |
|------------------|----------|
| A. Finland | B. India |
| C. United States | |
- Only A
 - Only B
 - Only C
 - A and C
 - B and C
75. Which of the following statements is definitely TRUE in the context of the passage?
- The British Government has been religiously maintaining budget secrecy.
 - Budget secrecy is likely to lead to corrupt practices.
 - Consulting unjustifiable taxes with public helps make them accept those taxes.
 - There should be no control on public expenditure in democratic condition.
 - None of these

76. Sir Richard Clarke seems to deserve the credit for
- transformation in the British budgetary techniques.
 - maintenance of secrecy of the British budget.
 - detection of abuse of transparency in budget.
 - bringing down the tax load on British people.
 - None of these

DIRECTIONS (Qs. 77 & 78) : Choose the word which is most nearly the SAME in meaning to the word printed in bold as used in the passage.

77. **SCOURGE**
- | | |
|------------|------------------|
| (a) ritual | (b) presentation |
| (c) whip | (d) compromise |
| (e) remedy | |
78. **MYRIAD**
- | | |
|------------------|----------------|
| (a) adequate | (b) functional |
| (c) incompatible | (d) abundant |
| (e) excellent | |

DIRECTIONS (Qs. 79 & 80) : Choose the word which is most OPPOSITE in meaning to the word printed in bold as used in the passage.

79. **FLOURISHES**
- | | |
|----------------|-----------------|
| (a) disappears | (b) degenerates |
| (c) vanishes | (d) blooms |
| (e) opens | |
80. **DEBATED**
- questioned severely
 - opposed strongly
 - accepted unconditionally
 - discussed frankly
 - implemented forcibly

DIRECTION (Qs. 81 - 85) : In each of the following sentences, an idiomatic expression or a proverb is highlighted. Select the alternative which best describes its use in the sentence.

81. There was no opposition to the new policy by the **rank and file** of the Government.
- the official machinery
 - the ordinary members
 - the majority
 - the cabinet ministers
 - None of these
82. The clerk **wiped the nose** of his employer by submitting a false bill and was dismissed from his job.
- | | |
|----------------------|-------------|
| (a) Cleaned the nose | (b) Cheated |
| (c) Abused | (d) Slapped |
| (e) none of these | |
83. **I have a bone to pick** with you in this matter.
- | | |
|---------------------|---------------------|
| (a) Am in agreement | (b) Am angry |
| (c) Am indebted | (d) Will join hands |
| (e) None of these | |

84. The new C.M **stuck his neck out** today and promised 10kgs. free wheat a month for all rural families.
- (a) took an oath (b) took a risk
(c) extended help (d) caused embarrassment
(e) None of these
85. Harassed by repeated acts of injustice. he decided to **put his foot down**.
- (a) not to yield
(b) resign
(c) to accept the proposal unconditionally
(d) withdraw
(e) none of these

DIRECTIONS (Qs. 86-90): Rearrange the following six sentences (A), (B), (C), (D) and (E) in the proper sequence to form a meaningful paragraph, then answer the questions given below them.

- A. The British government plans to insist that spouses should have to learn English before they are allowed into Britain to join their husbands or wives have run into a barrage of opposition and warnings that the idea could breach human rights laws.
- B. The responses to an official consultation on the proposal published on Thursday was more than two to one against the proposal, with many warning it could break up marriages because many cannot afford or access English lessons!
- C. Immigration lawyers have told ministers that spouses and fiances should not be barred from joining a partner in the U.K. for language reasons and that the plan could breach the human rights convention's guarantees to the right to marry and have a family life.
- D. The anonymised responses were 68 to 31 against the pre-entry english test for spouses.
- E. Other immigration organizations said the measure would discriminate against those from rural areas in South Asia, where the opportunities to learn English are limited.
86. Which of the following should be the **FIRST** sentence?
- (a) A (b) B
(c) C (d) D
(e) E
87. Which of the following should be the **SECOND** sentence?
- (a) A (b) B
(c) C (d) D
(e) E
88. Which of the following should be the **THIRD** sentence?
- (a) A (b) B
(c) C (d) D
(e) E
89. Which of the following should be the **FOURTH** sentence?
- (a) A (b) B
(c) C (d) D
(e) E

90. Which of the **following should** be the **FIFTH (LAST)** sentence?
- (a) A (b) B
(c) C (d) D
(e) E

DIRECTIONS (Qs. 91-95) : In each of these questions, each sentence has four underlined words or phrases marked (a), (b), (c), (d) and (e). Choose one word or phrase that must be changed for the sentence to be correct.

91. **It's** (a) imperative that a management student **maintains** (b) a grade point **of** (c) "B" in **his** (d) major field. No errors (e).
92. **Regardless of** (a) your teaching method, the objective of any conversation class **should be** (b) for the students **to practice** (c) **speaking words**. (d). No errors (e)
93. When they **have been** (a) **frightened**, (b) as for example, 2Y (c) an electrical storm, dairy cows may refuse **giving** (d) milk. No errors (e)
94. If the ozone gases of the atmosphere **did not filter out** (a) the ultraviolet rays of the sun, life **as** (b) we know **it** (c) would not have evolved **on earth** (d). No errors (e)
95. The pleura that **cover** (a) the **exterior** (b) of the **lungs** (c) and the inner walls of the chest cavity **is** (d) a thin elastic membrane. No errors (e)

DIRECTIONS (Qs. 96 - 100) : Fill in the blanks in the following sentences using the most appropriate word or words from the options given :

96. Learning is more efficient when it is _____. It is less efficient when it is _____
- (a) Fast – slow (b) Fun – drudgery
(c) Rapid – turtle-slow (d) Tedious – like a joy ride
(e) None of these
97. Physicians may soon have _____ to help paralysed people move their limbs bypassing the _____ nerves that once controlled their muscles.
- (a) Instruments – detrimental
(b) Ways – damaged
(c) Reason – involuntary
(d) Impediments – complex
(e) None of these
98. The Internet is a medium where the users have nearly _____ choices and _____ constraints about where to go and what to do.
- (a) Unbalanced – nonexistent
(b) Embarrassing – no
(c) Unlimited – minimal
(d) Choking – shocking
(e) None of these

99. Education is central because electronic networks and software-driven technologies are beginning to _____ the economic barriers between the nations.
 (a) Break down (b) Break
 (c) Crumble (d) Dismantle
 (e) None of these
100. The present Constitution will see _____ amendments but its basic structure will survive.
 (a) Much more (b) Too many more
 (c) Quite a few more (d) Many more
 (e) None of these

RESPONSE SHEET

- | | | | | | | | | | |
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Answer Key

1	(d)	11	(b)	21	(c)	31	(d)	41	(c)	51	(d)	61	(b)	71	(c)	81	(b)	91	(c)
2	(b)	12	(c)	22	(c)	32	(d)	42	(e)	52	(d)	62	(c)	72	(e)	82	(b)	92	(c)
3	(a)	13	(b)	23	(d)	33	(c)	43	(a)	53	(a)	63	(a)	73	(b)	83	(b)	93	(d)
4	(c)	14	(b)	24	(b)	34	(c)	44	(a)	54	(a)	64	(d)	74	(d)	84	(b)	94	(a)
5	(e)	15	(a)	25	(c)	35	(b)	45	(d)	55	(b)	65	(c)	75	(e)	85	(a)	95	(a)
6	(d)	16	(c)	26	(c)	36	(d)	46	(d)	56	(d)	66	(c)	76	(a)	86	(a)	96	(b)
7	(b)	17	(b)	27	(a)	37	(b)	47	(e)	57	(c)	67	(c)	77	(c)	87	(b)	97	(b)
8	(c)	18	(a)	28	(d)	38	(c)	48	(d)	58	(c)	68	(e)	78	(d)	88	(d)	98	(c)
9	(e)	19	(a)	29	(b)	39	(a)	49	(b)	59	(a)	69	(a)	79	(b)	89	(c)	99	(d)
10	(e)	20	(a)	30	(a)	40	(e)	50	(e)	60	(e)	70	(b)	80	(c)	90	(e)	100	(d)

Answers & Explanations

1. (d) $? = \frac{5}{8} \times \frac{4}{9} \times \frac{3}{5} \times 222 = 37$

2. (b) Let the number be x

$$\therefore \frac{56}{100} \times 450 + x = 300$$

$$\text{or } x = 300 - 252 = 48$$

3. (a) $(27)^{1.5} \times (21)^{3.5} = (27)^?$

$$\therefore ? = 5 \left[\because a^x + a^y = a^{(x+y)} \right]$$

4. (c) Let the number be x .

$$\therefore 27.06 \times 25 - x = 600$$

$$\text{or, } x = 676.5 - 600 = 76.5$$

5. (e) $? = \frac{39}{8} \times \frac{30}{13} = \frac{45}{4} = 11\frac{1}{4}$

6. (d) $8^4 \times \frac{1}{8^3} \times 8^5 \times \frac{1}{8^2} = 8^{4-3+5-2} = 8^4 \therefore ? = 4$

7. (b) $-(a-b) \cdot x = b-a$

Put x replacing '?' (question mark)

$$\text{or } -[-(a-b)x] = -[b-a] \text{ or } (a-b)x = a-b$$

$$\text{or } x = \frac{a-b}{a-b} = 1$$

8. (c) $a+b = ? \times (-a-b)$

$$\text{or } a+b = x \cdot (-a-b)$$

[Put x replacing '?' (question mark)]

$$\text{or } a+b = x \cdot (a+b)$$

$$\text{or } x = -1$$

9. (e) $|?+14| = 11$ or $?+14 = 11$ or -11

$$\therefore ? = -25 \text{ or } -3$$

10. (e) $16 + 26 \times 2 = 16 + 52 = 68$

11. (b) $\frac{12}{119} = 0.1008, \frac{1}{10} = 0.1$

$$\frac{4}{39} = 0.102 \text{ and } \frac{7}{69} = 0.101$$

Thus, $\frac{1}{10}$ is the least.

12. (c) Let there be n points marked on the plane.

$$\text{Total number of line segments} = {}^n C_2 = 10$$

$$\Rightarrow \frac{n(n-1)}{2} = 10$$

$$\text{or } n^2 - n - 20 = 0$$

$$\text{or } (n-5)(n+4) = 0$$

$$\text{or } n = 5 \quad [n = -4 \text{ is rejected}]$$

13. (b) Let the sum of money be ₹ x .

$$\text{Now, } 8x = x \left(1 + \frac{r}{100} \right)^3$$

$$\text{or, } \left(1 + \frac{r}{100} \right)^3 = (2)^3 \text{ or } 1 + \frac{r}{100} = 2$$

Again, let the sum becomes 16 times in n years. Then,

$$16x = x \left(1 + \frac{r}{100} \right)^n$$

$$\Rightarrow 16 = 2^n \text{ or } 2^4 = 2^n \text{ or } n = 4$$

14. (b) Let the cost price of machine be ₹ 100

SP of machine at a profit of 10% = ₹ 110

SP of machine at a loss of 10% = ₹ 90

If SP is $(110 - 90) = ₹ 20$ less then CP = ₹ 100

Therefore, if SP is ₹ 40 less, then

$$\text{CP} = \frac{100}{20} \times 40 = ₹ 200$$

15. (a) Let us work with the options.
 For (a), total cost = $7 \times 480 + 2 \times 130 = 3620$
 For (b), total cost = $7 \times 480 + 3 \times 130 = 3750$
 For (c), total cost = $2 \times 480 + 7 \times 130 = 1870$
 Hence, option (a) is correct.
16. (c) Relative speed of the trains = $(40 + 20) = 60$ m/s
 Distance = $(120 + 120) = 240$ m
 Time taken by trains to cross each other completely

$$= \frac{240}{60} = 4\text{s}$$

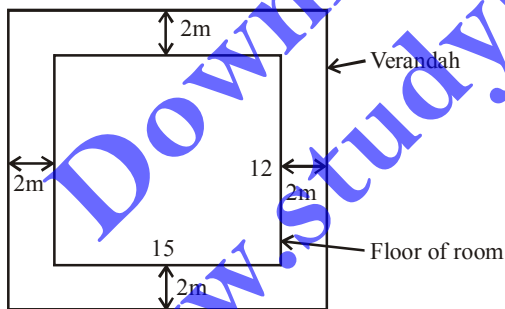
 \therefore Larger the no. of cogs (tooth of wheel) of wheel, lesser will be that no. of revolution made by it.

17. (b) Let Sunil finishes the job in x hours.
 Then, Ramesh will finish the job in $\frac{x}{2}$ hours.
 We have, $x - \frac{x}{2} = 3 \Rightarrow x = 6$
 Therefore, Sunil finishes the job in 6 hours and Ramesh in 3 hours.

$$\text{Work done by both of them in 1 hour} = \frac{1}{6} + \frac{1}{3} = \frac{1}{2}$$

They together finish the piece of work in 2 hours.

18. (a) Let the present age of the man = x years
 Now, $(x + 15) = 4(x - 15)$
 or $3x = 75$ or $x = 25$ years
19. (a) Area of the outer rectangle = $19 \times 16 = 304 \text{ m}^2$



$$\text{Area of the inner rectangle} = 15 \times 12 = 180 \text{ m}^2$$

$$\therefore \text{Required area} = (304 - 180) = 124 \text{ m}^2$$

20. (a) Manoj's monthly income

$$= \frac{2.16 \times 100000}{12} = ₹ 18000$$

 \therefore Pratul's monthly income

$$= 18000 \times \frac{1}{4} = ₹ 4500$$

 \therefore Pratul's annual income

$$= 12 \times 4500 = ₹ 54000$$

21. (c) The terms exhibit the pattern $2^1, 2^2, 2^3$ and so on.
 22. (c) Try the pattern $n^3 - 1, n = 1, 2, \dots$
 23. (d) Pattern is $2^2, 4^2 - 1, 4^2, 6^2 - 1, 6^2$ and so on.
 24. (b) Can you see that the pattern is $1^2, 2^3, 3^2, 4^3, 5^2, 6^3, 7^2$
 25. (c) Note that

$$0 = 1^3 - 1 \quad 6 = 2^3 - 2$$

$$24 = 3^3 - 3$$

 26. (c) $? = \sqrt{1223.9975} \approx 34$
 27. (a) $? = 503 \times 201 = 101103 \approx 101100$
 28. (d) $? = 1205 \div 2.5 = 482 \approx 480$
 29. (b) $? = 22020 \div 0.011 = 2001818 \approx 2002000$
 30. (a) $? = \sqrt{\sqrt{20800}} \approx \sqrt{144} = 12$
 31. (d) Total expenditure

$$= 306 + 300 + 300 + 306 + 300 + 306 + 306$$

$$= ₹ 2124 \text{ thousands}$$

 32. (d) Total expenditure in the year 1998

$$= 300 + 306 + 306 + 312 + 318 + 300 + 312$$

$$= ₹ 2154 \text{ thousands}$$

 Total expenditure in 1997 and 1998

$$= 2124 + 2154 = 4278 \text{ thousands}$$

 33. (c) Average monthly expenditure in year 1999

$$= \frac{312 + 312 + 318 + 318 + 306 + 312 + 318}{7}$$

$$= \frac{2196}{7} = 313.714 \text{ thousands} \approx ₹ 3,14,000$$

 34. (c) In the year 1999, the least expenses of ₹ 306 thousands is in the month of May.
 35. (b) Expenditure in April 1998 = 312 thousands
 Expenditure in April 1999 = 318 thousands

$$\text{Required \%} = \frac{6}{312} \times 100 = 1.92 \approx 2\%$$

 36. (d) Accordingly,

$$F @ N \Rightarrow F \leq N$$

$$N \delta R \Rightarrow N > R$$

$$H @ R \Rightarrow H \leq R$$

$$\therefore F \leq N > R \geq H$$

Conclusion : I. $H \delta N \Rightarrow H > N$ [not true]
II. $F \# R \Rightarrow F < R$ [not true]
 If neither conclusion I nor II is true.
 37. (b) Accordingly,

$$M \# T \Rightarrow M < T$$

$$T @ K \Rightarrow T \leq K$$

$$K \$ N \Rightarrow K \geq N$$

$$\therefore M < T \leq K \geq N$$

Conclusion : I. $M \# N \Rightarrow M < N$ [not true]
II. $K \delta M \Rightarrow K > M$ [not true]
 Only conclusion II is true.

38. (c) Accordingly,

$$T \% H \Rightarrow T = H$$

$$H \$ W \Rightarrow H \geq W$$

$$\therefore T = H \geq W$$

Conclusion : I. $W \# T \Rightarrow W < T$ [true]

II. $W \% T \Rightarrow W = T$ or

If either conclusion I or II is true. [true]

39. (a) Accordingly,

$$N \delta K \Rightarrow N > K$$

$$K \# D \Rightarrow K < D$$

$$D \% M \Rightarrow D = M$$

$$\therefore N > K < D = M$$

Conclusion : I. $M \delta K \Rightarrow M > K$ [true]

II. $D \delta N \Rightarrow D > N$ [not true]

Only conclusion I is true.

40. (e) Accordingly,

$$J \$ B \Rightarrow J \geq B$$

$$B \% R \Rightarrow B = R$$

$$R \delta F \Rightarrow R > F$$

$$\therefore J \geq B = R > F$$

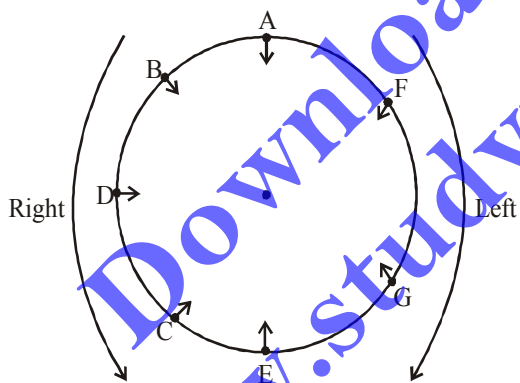
Conclusion : I. $F \# B \Rightarrow F < B$ [true]

II. $R @ J \Rightarrow R \leq J$ [true]

Both conclusion I and II are true.

Solutions (41 - 45)

Sitting arrangement is given below.



41. (c) E is to the immediate right of C

42. (e) F is sitting between A and G

43. (a) B is the immediate left of D

44. (a) Second to the left of C is B

45. (d) E is second to the right of D.

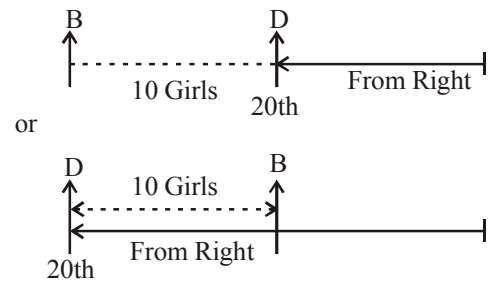
46. (d) According to statements I

D is the 20th from right end.

According to statement (ii)

10 girls are in between B and D.

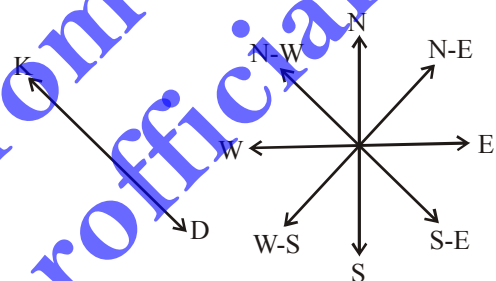
Combining statement (i) and (ii).



Both statements are not sufficient to answer the question.

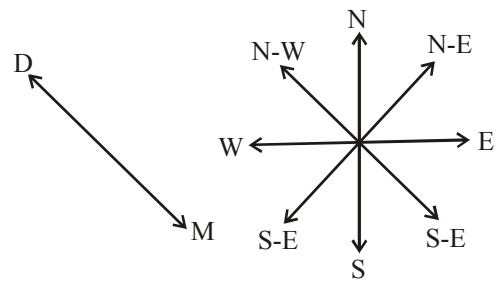
47. (e) According to statement I

Town K is in north-west with respect to town D.

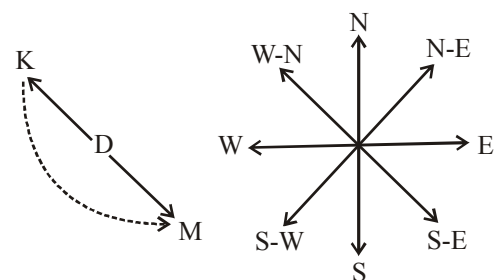


According to statement II.

Town M is in S-E w.r.t to D



Combining statement I and II

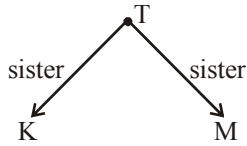


Town M is in S-E w.r.t town, K.

Both statements required to answer the question

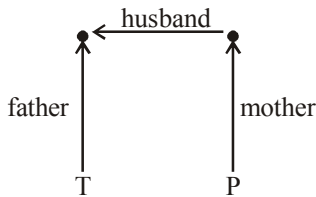
48. (d) From statement I

K and M are sister of T

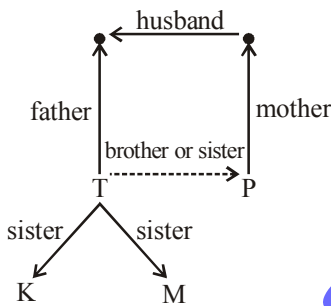


From statement II.

T's father is husband of P's mother.



From statements - I and II



Both statements are not sufficient to answer the question.

49. (b) According to Statement I

Arun did not went London on sunday.

According to statement II:-

Arun's brother went London on Friday

Hence only statement II are sufficient to answer the question.

50. (e) From statement I

new (good) (clothes) ⇒ 5 (3) (9)

From statement II

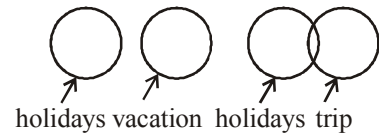
(good) (clothes) are costly ⇒ (9) 6 7 (3)

Combining statement - I and II

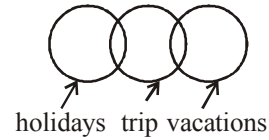
new ⇒ 5

Both statements are required to answer the question.

51. (d) According to statement

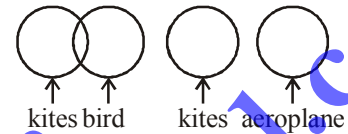


or,



If neither conclusion I and nor II follow.

52. (d) According to statement

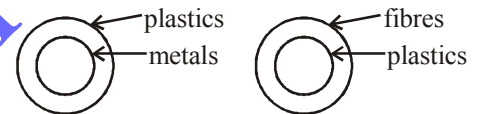


or

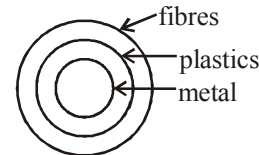


If neither conclusion I and II follows.

53. (a) According to statement

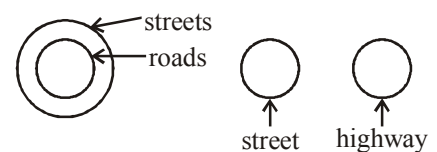


or,

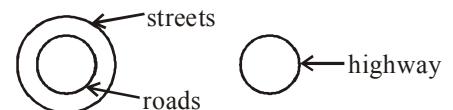


Only conclusion I follows.

54. (a) According to statement

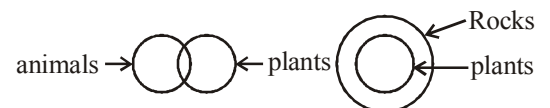


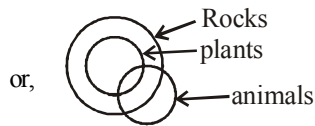
or,



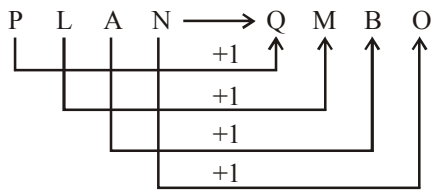
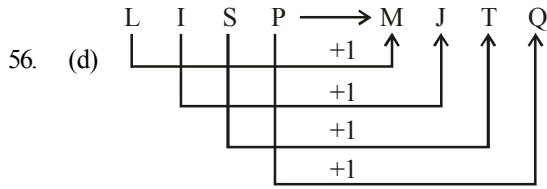
Hence only conclusion I follow.

55. (b) According to statement I

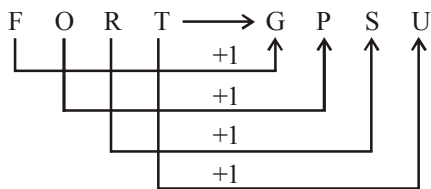




Hence, only conclusion II follows.



Therefore,



57. (c) 'Artificial' is antonym of 'Natural'. Similarly, 'Private' antonyms of 'Public'.
 58. (c) $21 = 7 \times 3$; $91 = 7 \times 13$;
 $77 = 7 \times 11$; $35 = 7 \times 5$;
 But, $65 = 7 \times 9.28$

59. (a) $\xrightarrow{6} \boxed{P} \parallel \boxed{V} \parallel \boxed{V} \xleftarrow{12}$
 Vishal's rank from the top is 10th.
 60. (e) 1, 12, 123, 1234, 12345, 123456, 1234567
 61. (b) Ninth to the right of the 20th from the right means 11th from the right, i.e., M.

62. (c)

Symbol	Consonant	Symbol
--------	-----------	--------

 Such combinations are :

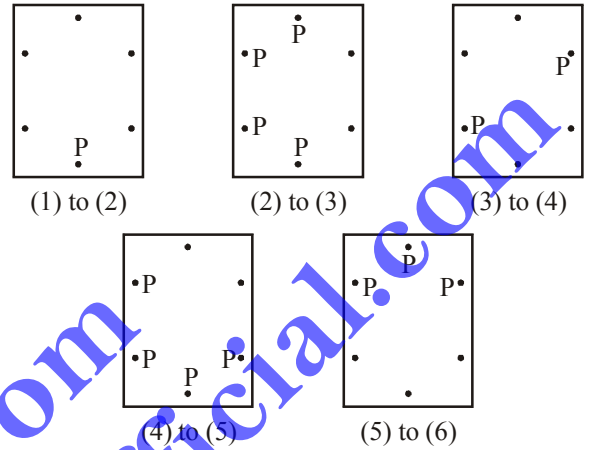
@	F	!	:	+	J	©
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63. (a) New arrangement
 H F 3 U 6 G I T P L 8 9 S 2 7 A M K
 |-----|
 12th from left

64. (d) $L \xrightarrow{+2} S \xrightarrow{-1} 8$
 $A \xrightarrow{+2} K \xrightarrow{-1} M$
 $@ \xrightarrow{+2} I \xrightarrow{-1} F$
 $6 \xrightarrow{+1} \% \xrightarrow{+1} G$
 $J \xrightarrow{+2} D \xrightarrow{-1} ©$

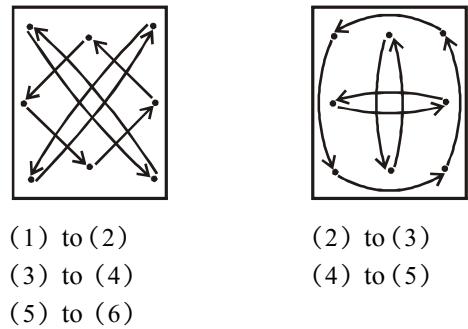
65. (c) $F \xrightarrow{+5} \% \xrightarrow{+6} L \xrightarrow{+7} \boxed{7}$
 $3 \xrightarrow{+5} I \xrightarrow{+6} S \xrightarrow{+7} \boxed{A}$
 $U \xrightarrow{+5} T \xrightarrow{+6} \wedge \xrightarrow{+7} \boxed{M}$

66. (c) ∪ design of question figure inverted in following manner in his next step.



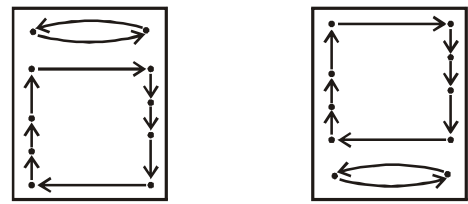
Next figure is similar to option (c)

67. (c) In next figure of each question upper left part is inverse and one part is eliminated and hence in such a way option no (c) will be next figure
 68. (e) Designs of question figure changes their place in following way in his next step.



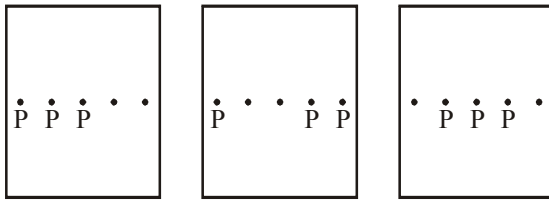
According to above arrangement next figure is (e)

69. (a) Designs of question figure changes their place in following way in his next step.



- (1) to (2) (2) to (3)
 (3) to (4) (4) to (5)
 (5) to (6)
 According to above arrangement next figure is (a)

70. (b) Next figure of each question figure is rotated anticlockwise by 45° and 90° , so according to this next figure is option (b)



- (1) to (2) (2) to (3) (3) to (4)
(4) to (5) (5) to (6)

According to above arrangement next figure is (b)

71. (c) Eminent British economists and political scientists have strongly attacked the tradition of budget secrecy.
72. (e) It leads to the control of public expenditure in order to set realistic taxation implications.
73. (b) He has presented the example of both the open budget system and the secret budget system, practised by various countries and has looked into all their aspects.
76. (a) Sir Richard Clarke was the originating genius of nearly every important development in the British budgeting techniques during the last two decades.

Sol For. (Q.86-90): The required arrangement is ABDCE.

A is the opening sentence as is clear from the given options. A is followed by B as 'the proposal' mentioned in B is referring to whatever has been talked in A. B is followed by D as D continues to talk about the response mentioned in B. Also note that B mentions a 2 : 1 response against the

proposal which is also clear by the 68 : 31 mentioned in D. D is followed by C and C is followed by E. The 'other immigration organizations' mentioned in E clearly states that the previous sentence must have a statement from some other organization, which is the immigration lawyers as mentioned in C.

91. (c) 'Of' is unnecessary. The right use is grade point 'B'.
92. (c) There are two usage of practice-practice which is a noun and practise, which is verb. to + verb is the correct use so the right answer should be 'to practise'.
94. (a) The last part of the sentence refers to the work completed in the past. In the format of, if and then, the tenses of two verbs in both parts should be same so it should have been 'had not filtered out'.
95. (a) For singular subject the verb in the simple present tense is plural so 'covers' not 'cover'.
96. (b) Learning can be made very efficient if it is delivered in the form of fun - games or interesting exercises. Drudgery means hard monotonous routine work. Clearly it makes the learning less efficient.
97. (b) 'Ways' is the best choices among the four as 'ways to help the paralysed people' is the right usage. Further we need to bypass the damaged or blocked nerves.
98. (c) The Internet offers unlimited choices and minimal constraints to the users.
99. (d) Dismantle (to disassemble or pull down; take apart) is the right usage in the context of the passage.
100. (d) Much means great in quantity, measure, or degree. Many means a large or considerable number of persons or things. So many more is the right usage.

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $1/4^{\text{th}}$ of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-15): What will come in place of question mark (?) in the given question?

1. $4\frac{1}{2} + \left(1 \div 2\frac{8}{9}\right) - 3\frac{1}{13} = ?$

(a) $1\frac{9}{26}$

(b) $2\frac{7}{13}$

(c) $1\frac{11}{26}$

(d) $2\frac{4}{13}$

(e) $1\frac{10}{13}$

2. $\frac{6 \times 136 \div 8 + 132}{628 \div 16 - 26.25} = ?$

(a) 15

(b) 24

(c) 18

(d) 12

(e) 28

3. $\{(441)^{1/2} \times 207 \times (343)^{1/3}\} \div \{(14)^2 \times (529)^{1/2}\}$

(a) $6\frac{1}{2}$

(b) $5\frac{1}{2}$

(c) $5\frac{3}{4}$

(d) $6\frac{3}{4}$

(e) $6\frac{1}{4}$

4. $\{\sqrt{7744} \times (11)^2\} \div (2)^3 = (?)^3$

(a) 7

(b) 9

(c) 11

(d) 13

(e) 17

5. $(4356)^{1/2} \div \frac{11}{4} = \sqrt{?} \times 6$

(a) 2

(b) 4

(c) 8

(d) 6

(e) 16

6. $\frac{3}{8}$ of $\{4624 \div (564 - 428)\} = ?$

(a) $13\frac{1}{4}$

(b) $14\frac{1}{2}$

(c) $11\frac{5}{6}$

(d) $12\frac{3}{4}$

(e) $12\frac{1}{8}$

7. $456 \div 24 \times 38 - 958 + 364 = ?$

(a) 112

(b) 154

(c) 128

(d) 136

(e) 118

8. $(43)^2 + 841 = (?)^2 + 1465$

(a) 41

(b) 35

(c) 38

(d) 33

(e) 30

9. $3\frac{3}{8} \times 6\frac{5}{12} - 2\frac{3}{16} \times 3\frac{1}{2} = ?$
 (a) 21 (b) 18
 (c) 14 (d) 15
 (e) 16
10. $(34.5 \times 14 \times 42) + 2.8 = ?$
 (a) 7150 (b) 7365
 (c) 7245 (d) 7575
 (e) 7335
11. $(216)^4 + (36)^4 \times (6)^5 = (6)^?$
 (a) 13 (b) 11
 (c) 7 (d) 9
 (e) 10
12. $\frac{\sqrt{4356 \times \sqrt{?}}}{\sqrt{6084}} = 11$
 (a) 144 (b) 196
 (c) 169 (d) 81
 (e) 121
13. $\left(3\frac{6}{17} \div 2\frac{7}{34} - 1\frac{9}{25}\right) = (?)^2$
 (a) $\frac{2}{5}$ (b) $\frac{1}{3}$
 (c) $\frac{4}{5}$ (d) $\frac{1}{5}$
 (e) $\frac{3}{5}$
14. $(1097.63 + 2197.36 - 2607.24) \div 3.5 = ?$
 (a) 211.5 (b) 196.5
 (c) 209.5 (d) 192.5
 (e) 189.5
15. $\frac{1}{11}$ of $[(17424)^{1/2} \div (66)^2 \times 3^3] = ?^2$
 (a) $\frac{1}{11}$ (b) $\frac{3}{11}$
 (c) $\frac{2}{11}$ (d) $\frac{4}{11}$
 (e) $\frac{5}{11}$
16. 12 yr ago the ratio between the ages of A and B was 3 : 4 respectively. The present age of A is $3\frac{3}{4}$ times of C's present age. If C's present age is 10 yr, then what is B's present age? (in years)
 (a) 48 (b) 46
 (c) 60 (d) 54
 (e) 36
17. A certain number of capsules were purchased for ₹ 216, 15 more capsules could have been purchased in the same amount if each capsule was cheaper by ₹ 10. What was the number of capsules purchased?
 (a) 6 (b) 14
 (c) 8 (d) 12
 (e) 9
18. M, N, O and P divided ₹ 44352 among themselves. M took $\frac{3}{8}$ th of the money, N took $\frac{1}{6}$ th of the remaining amount and rest was divided among O and P in the ratio of 3 : 4 respectively. How much did O get as his share?
 (a) ₹ 9600 (b) ₹ 10600
 (c) ₹ 10300 (d) ₹ 8700
 (e) ₹ 9900
19. Pure milk costs ₹ 16 per litre. After adding water the milkman sells the mixture ₹ 15 per litre and thereby makes a profit of 25%. In what respective ratio does he mix milk with water?
 (a) 3:1 (b) 4:3
 (c) 3:2 (d) 5:3
 (e) 4:1
20. $\frac{1}{3}$ rd the diagonal of a square is $3\sqrt{2}$ m. What is the measure of the side of the concerned square?
 (a) 12m (b) 9m
 (c) 18m (d) 6m
 (e) 7m

DIRECTIONS (Qs. 21-25) : What will come in place of question mark (?) in the given number series?

21. 37, ?, 103, 169, 257, 367
 (a) 61 (b) 59
 (c) 67 (d) 55
 (e) 71
22. 4, 6, 34, ?, 504, 1234
 (a) 194 (b) 160
 (c) 186 (d) 156
 (e) 172
23. 3, ?, 14, 55, 274, 1643
 (a) 11 (b) 5
 (c) 6 (d) 8
 (e) 7
24. 960, 839, 758, 709, ?, 675
 (a) 696 (b) 700
 (c) 688 (d) 678
 (e) 684
25. 61, 72, ?, 73, 59, 367, 74, 58
 (a) 70 (b) 60
 (c) 71 (d) 62
 (e) 63
26. Two pipes can full a tank in 10 h and 16 h respectively. A third pipe can empty the tank in 32 h. If all the three pipes function simultaneously, then in how much time the tank will be full? (in hours)
 (a) $7\frac{11}{21}$ (b) $7\frac{13}{21}$
 (c) $8\frac{4}{21}$ (d) $6\frac{5}{14}$
 (e) $8\frac{9}{14}$

27. A merchant bought some goods worth ₹ 6000 and sold half of them at 12% profit. At what profit per cent should he sell the remaining goods to make an overall profit of 18%?
 (a) 24 (b) 28
 (c) 18 (d) 20
 (e) 26
28. A and B are two numbers. 6 times of square of B is 540 more than the square of A. If the respective ratio between A and B is 3 : 2, what is the value of B?
 (a) 10 (b) 12
 (c) 16 (d) 8
 (e) 14
29. The perimeter of a rectangle whose length is 6 m more than its breadth is 84 m. What would be the area of a triangle whose base is equal to the diagonal of the rectangle and whose height is equal to the length of the rectangle? (in m²)
 (a) 324 (b) 372
 (c) 360 (d) 364
 (e) 348
30. 56 workers can finish a piece of work in 14 days. If the work is to be completed in 8 days, then how many extra workers are required?
 (a) 36 (b) 48
 (c) 44 (d) 42
 (e) 32
35. What is the difference between the total number of pages printed by Printer E in 1st, 2nd and 4th week together and total number of pages printed by Printer C in all the given weeks together?
 (a) 952 (b) 878
 (c) 924 (d) 934
 (e) 918

REASONING ABILITY

DIRECTIONS (Qs. 31-35) : Study the table carefully and answer the given questions.

Number of Pages Printed by 6 Printers in 5 Different Weeks

Printer \ Week	A	B	C	D	E	F
1st	664	618	628	552	638	419
2nd	569	441	519	438	621	537
3rd	440	614	503	527	541	742
4th	256	563	347	651	412	321
5th	717	429	598	582	519	693

31. What is the respective ratio between the number of pages printed by Printer B in 2nd week and the number of pages printed by Printer F in 5th week?
 (a) 4 : 9 (b) 11 : 13
 (c) 9 : 13 (d) 7 : 11
 (e) 9 : 11
32. What is the average number of pages printed by all the given printers in 4th week?
 (a) 375 (b) 425
 (c) 415 (d) 430
 (e) 390
33. Which of the following printer printed maximum number of pages in all the given weeks together?
 (a) Printer A (b) Printer E
 (c) Printer D (d) Printer C
 (e) Printer F
34. Number of pages printed by Printer A in 3rd week is what per cent of the total number of pages printed by Printer D in all the given weeks?
 (a) 22 (b) 18
 (c) 12 (d) 14
 (e) 16
36. Four of the following five are alike in a certain way and hence form a group. Which of the following **does not** belong to that group?
 (a) Walk (b) Cry
 (c) Play (d) Study
 (e) Alive
37. How many such pairs of letters are there in the word 'VIRTUAL', each of which has as many letters between them in the word (in both forward and backward direction) as they have between them in the English alphabetical series?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
38. How many meaningful English words can be formed with the letters 'ILP' using all the letters only once in each word?
 (a) None (b) One
 (c) Two (d) Three
 (e) More than three
39. If each alternate letter in the word 'FLIPPER' starting with F is changed to the next letter in the English alphabetical series and each of the remaining letters is changed to the previous letters in the English alphabetical series then how many letters will appear more than once in the new arrangement?
 (a) None (b) One
 (c) Two (d) Three
 (e) Four
40. Pointing to a girl, Mr. Arun said. "She is the daughter of my mother's only child". How is the girl related to Mr. Arun?
 (a) Sister (b) Mother
 (c) Cousin (d) Daughter
 (e) Cannot be determined

DIRECTIONS (Qs. 41-45) : Study the following information to answer the given questions :

Eight friends A, B, C, D, E, F, G and H are sitting around a circle facing the centre, not necessarily in the same order. F sits fourth to the left of B. A and H are immediate neighbours of F. C sits third to the left of A. G sits third to the right of E.

41. What is D's position with respect to B?
 (a) Immediate left (b) Sixth to the right
 (c) Second to the left (d) Seventh to the left
 (e) Fifth to the right

42. What are the immediate neighbours of G ?
 (a) F and H (b) A and F
 (c) C and H (d) A and B
 (e) B and C
43. If C is related to E in a certain way and similarly F is related to B in the same way, to whom is A related to ?
 (a) H (b) D
 (c) G (d) C
 (e) Non of these
44. Four of the following five are alike in a certain way based on their seating positions in the above arrangement and so form a group. Which is the one that **does not** belong to the group ?
 (a) FE (b) HA
 (c) DG (d) BE
 (e) CF
45. If all the eight friends are made to sit alphabetically in the clockwise direction starting from A, positions of how many will remain unchanged (excluding A) ?
 (a) None (b) One
 (c) Two (d) Three
 (e) Four

DIRECTIONS (Qs. 46-50) : In each question below are two statements followed by two conclusions numbered I and II. You have to take the two given statements to be true even if they seem to be at variance from commonly known facts and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

Give answer (a) if only conclusion I follows.

Give answer (b) if only conclusion II follows.

Give answer (c) if either conclusion I or conclusion II follows.

Give answer (d) if neither conclusion I nor conclusion II follows.

Give answer (e) if both conclusions I and II follow.

46. **Statements :**
 Some windows are grills.
 All glasses are grills.
Conclusions :
 I. All grills are windows.
 II. At least some grills are glasses.
47. **Statements :**
 Some painters are artists. Some dancers are painters.
Conclusions :
 I. All artists are dancers.
 II. All painters are dancers.
48. **Statements :**
 All cabins are rooms.
 All rooms are buildings.
Conclusions :
 I. All buildings are rooms.
 II. All cabins are buildings.
49. **Statements :**
 All rings are necklaces.
 No necklace is a bracelet.

Conclusions:

I. No ring is a bracelet.

II. All necklaces are rings.

50. **Statements :**

All hands are arms.

Some hands are muscles.

Conclusions:

I. Some muscles are arms.

II. All muscles are arms.

DIRECTIONS (Qs. 51-55) : Study the following information to answer the given questions :

- Seven friends - L, M, N, O, P, Q and R are sitting in a straight line facing North, not necessarily in the same order. M sits fifth to the right of O. P sits third to the right of L. Both L and P do not sit at the extreme ends of the line. Q and R are immediate neighbours of each other. N sits third to the left of Q.
51. What is O's position with respect of R ?
 (a) Second to the right (b) Third to the left
 (c) Second to the left (d) Third to the right
 (e) None of these
52. Which of the following represents the friends sitting at the extreme ends of the line?
 (a) O, M (b) Q, O
 (c) N, M (d) Q, N
 (e) None of these
53. If all the seven friends are made to sit in alphabetical order from **left to right**, the positions of how many will remain unchanged ?
 (a) Four (b) Three
 (c) One (d) Two
 (e) None
54. Who sits exactly in the middle of the row ?
 (a) P (b) L
 (c) Q (d) R
 (e) None of these
55. Four of the following five are alike in a certain way based on their seating positions in the above arrangement and so form a group. Which is the one that **does not** belong to the group ?
 (a) MP (b) RQ
 (c) ON (d) LN
 (e) QL

DIRECTIONS (Qs. 56-58) : In each question below is given a group of numbers/symbols followed by five combinations of letter codes numbered (a), (b), (c), (d) and (e). You have to find out which of the combinations correctly represents the group of numbers/symbols based on the following coding system and the conditions and mark the number of that combination as your answer.

Number/ Symbols	9	4	&	5	%	3	#	7	6	@	8	+	2	\$
Letter Codes	X	P	J	H	B	D	K	F	S	T	N	G	R	L

Conditions:

- (i) If the first element is a symbol and the last element is a number, then the codes for both are to be interchanged.
 - (ii) If both the first and last elements are symbols, then the last element is to be coded as the code for the first element.
 - (iii) If the group of elements contains only one symbol, then that symbols is to be coded as A.
56. 28%956
 (a) RNBXHS (b) RNAXSH
 (c) RNBXSH (d) RNAXHS
 (e) RNASHX
57. ©62+74
 (a) PSRGFT (b) TSRFGP
 (c) PSRFGT (d) PRSGFT
 (e) TSRGFP
58. +5963%
 (a) GHXSDG (b) GSHXDB
 (c) GHXDSG (d) GHSXDB
 (e) GXHSDG

DIRECTIONS (Qs. 59-62) : In these questions, relationships between different elements is shown in the statements. These statements are followed by two conclusions.

- Give answer (a) if only conclusion I follows.
- Give answer (b) if only conclusion II follows.
- Give answer (c) if either conclusion I or conclusion II follows.
- Give answer (d) if neither conclusion I nor conclusion II follows.
- Give answer (e) if both conclusions I and II follow.

59. **Statement :**
 $A < L < T < R \leq H > K$

- Conclusions :**
 I. $H > L$
 II. $K > T$

60. **Statement :**
 $P = N > D \geq G < B = J$

- Conclusions :**
 I. $G < P$
 II. $G < J$

61. **Statement :**
 $F \leq C \geq V = Z < X = U$

- Conclusions :**
 I. $V < U$
 II. $Z < F$

62. **Statement :**
 $Q \leq E = I > N \geq R \geq S$

- Conclusions :**
 I. $E = S$
 II. $S \leq N$

63. Which of the following symbols should replace question mark (?) in the given expression in order to make the expressions 'A > D' and 'F ≥ C' definitely true?
 $A > B \geq C ? D \leq E = F$

- (a) >
- (b) <
- (c) ≤
- (d) =
- (e) Either = or ≥

64. Which of the following expressions is definitely true if the given expressions 'R < P' as well as 'S > Q' are definitely true?

- (a) $P > Q = R \leq T < S$
- (b) $S > T \geq R > Q < P$
- (c) $Q > R \leq T > P \geq S$
- (d) $S > T \geq R > Q > P$
- (e) None of these

65. Read the following information carefully and answer the question which follows:

- 'A × B' means 'A is the father of B'.
- 'A + B' means 'A is the daughter of B'.
- 'A ÷ B' means 'A is the son of B'.
- 'A - B' means 'A is the sister of B'.

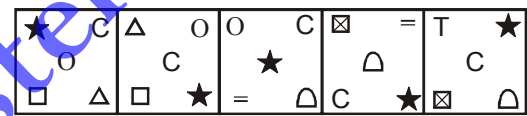
What will come in place of question mark to establish that P is the son-in-law of S in the following expression?

$P \times Q + R - T ? S$

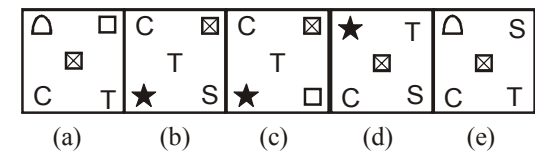
- (a) +
- (b) ×
- (c) -
- (d) ÷
- (e) Either + or ÷

DIRECTIONS (Qs. 66-70) : In each of the questions given below which one of the five answer figures on the right should come after the problem figures on the left, if the sequence were continued?

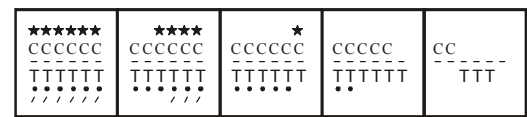
66. **Problem figures**



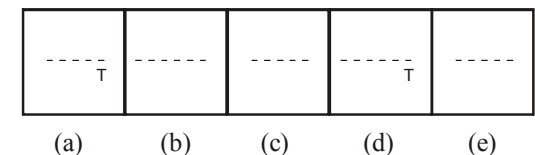
Answer figures



67. **Problem figures**



Answer figures



68. **Problem figures**

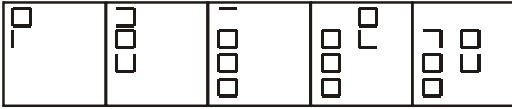


Answer figures

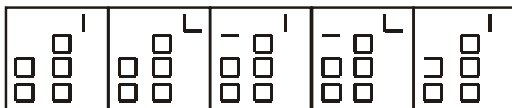
S O	O S	S O	S ★	T S
C	C	C	C	C
T ★	★ T	★ T	O T	★ O

(a) (b) (c) (d) (e)

69. Problem figures



Answer figures



(a) (b) (c) (d) (e)

70. Problem figures



Answer figures



(a) (b) (c) (d) (e)

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-75) : Which phrase should replace the phrase given in bold in the sentence to make it grammatically correct? If the sentence is correct as it is given, then mark 'No correction required' as your answer.

71. We asked her **that how she got** time to write all these books.
 (a) that how did she got
 (b) that how she was getting
 (c) how did she get
 (d) how she got
 (e) No correction required
72. Studies in the past have shown that those who limit their activity span during the day in winters are **more likely to** suffer from depression.
 (a) more likely for (b) mostly likely to
 (c) most likely for (d) most likeliest for
 (e) No correction required
73. In some cases, factors like low salary, lack of growth prospects and lack of motivation **compel all employee** to look for a change.
 (a) compel those employees
 (b) compelling all employees
 (c) compelling the employee
 (d) compel employees
 (e) No correction required

74. Living with compassion and contributing to others lives **would helping us** add happiness to our lives as well.
 (a) will helping us (b) will help us
 (c) would helped them (d) will helped us
 (e) No correction required
75. The **easiest way for** prevent stress caused by work or home pressures is to indulge in high levels of physical activity.
 (a) easily way to (b) easier ways for
 (c) easiest way to (d) easier way from
 (e) No correction required

DIRECTIONS (Qs. 76-80) : Read this sentence to find out whether there is any grammatical mistake/error in it. The error, if any, will be in one part of the sentence. Mark that part with the error as your answer. If the sentence is correct as it is, mark 'No error' as your answer. (Ignore the errors of punctuation if any.)

76. A red and sore tongue/is an indicator from/lack of iron Vitamin-B₁₂/in the body.
 (a) a red and sore tongue
 (b) is an indicator from
 (c) lack of iron and Vitamin-B₁₂
 (d) in the body
 (e) No error
77. In the high-strung life/of over- crowded metros/there a constantly tug of war/over space and resources.
 (a) in the high-strung life
 (b) of over-crowded metros
 (c) there a constantly tug of war
 (d) over space and resources
 (e) No error
78. The foremost criterion of selection we adopted/were the number of years of training/a singer had received/under a particular guru.
 (a) The foremost criterion of selection we adopted
 (b) were the number of years of training
 (c) a singer had received
 (d) under a particular guru
 (e) No error
79. Excess weight is the result of/unhealthy eating habits/which are inherent risk factors/responsible for many diseases.
 (a) excess weight is the result of
 (b) unhealthy eating habits
 (c) which are inherent risk factors
 (d) responsible for many diseases
 (e) No error
80. The therapeutic benefits/at helping others/have long been/recognised by people.
 (a) the therapeutic benefits (b) at helping others
 (c) have long been (d) recognised by people
 (e) No error

DIRECTIONS (Qs. 81-85): Rearrange the given five sentences (A, B, C, D) and (E) in a proper sequence so as to form a meaningful paragraph and then answer the given questions.

- A. With so many products and opportunities available in the market, it is very easy to get this planning wrong.

- B. Planning, therefore, is imperative and should begin as early as possible.
- C. What amount will we need and when will we need it?
- D. Most of us would put our children's education above any other priority in life including our own retirement.
- E. So, let's try to find the best solution by asking two important question.
81. Which of the following should be the **SECOND** sentence after rearrangement?
 (a) D (b) B
 (c) C (d) E
 (e) A
82. Which of the following should be the **FIFTH** sentence after rearrangement?
 (a) A (b) B
 (c) C (d) E
 (e) D
83. Which of the following should be the **FIRST** sentence after rearrangement?
 (a) A (b) B
 (c) E (d) C
 (e) D
84. Which of the following should be the **THIRD** sentence after rearrangement?
 (a) D (b) B
 (c) C (d) E
 (e) A
85. Which of the following should be the **FOURTH** sentence after rearrangement?
 (a) A (b) B
 (c) E (d) D
 (e) C
89. I. In a world so riddled with greed and corruption where every man seems to be out to get another, it is not very to trust others.
 (a) good (b) exciting
 (c) wise (d) easy
 (e) interesting
90. I. The area under our eyes is connected to our kidneys, so any change in the dark circles indicates dehydration or accumulating toxins.
 II. Many Indian adults are struggling with weight, thus indulging in weight loss programmes that require changes in their current lifestyle.
 (a) drastic (b) frequent
 (c) ambiguous (d) severe
 (e) aggressive
90. I. Usually fund-raising events and charity auctions raise a large amount of money as people from all sections of the society get an opportunity to for a cause.
 II. Today, a person needs to very hard for surviving in the corporate race.
 (a) work (b) contribute
 (c) effort (d) donate
 (e) dedication

DIRECTIONS (Qs. 91-100): In the given passage there are blanks, each of which has been numbered. Against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.

Trust is the basic tenet for all relationships, so building an environment of trust is one of the (91) important things one can do to (92) a positive work environment. It is a philosophy that must be demonstrated in everything you and your staff does. Trust is about doing what you say you are going to do and being who you say you (93). It is about showing your staff in everything you do that you are reliable, responsible and accountable and that they can (94) on you for consistency. Also, letting them know you (95) the same from them. When your words and behaviour are congruent you (96) trust. It will take sometime for your staff members to learn that you are a person of your word. If they see that you are consistent you will build trust, but if they see that your words don't match your behaviour their trust in you will be (97). The unfortunate thing about trust is that it takes a long time to build, but is very fragile and breaks easily. Once broken, it takes an (98) longer time to regain and it may never be fully rebuilt. Therefore, it is of primary importance that you are (99) of all your words and behaviour and ensure that they are worthy of your employees' trust. Even while dealing with uncomfortable situations, if you are honest and upfront it will make thing (100) for everyone.

86. I. The report ended on a note.
 II. They must take steps to deal with the problem.
 (a) criticising (b) huge
 (c) positive (d) fancy
 (e) cursory
87. I. In today's world parents usually that their children do not talk to them as they are more involved in electronic gadgets and social media.
 II. He would about every other child on the playground and his parents would fight with other parents so as to protect him.
 (a) feel (b) defend
 (c) fight (d) complain
 (e) observe
88. I. He was good with Mathematics so he could not fathom why other people cribbed about such an subject.
 91. (a) most (b) single
 (c) extreme (d) high
 (e) crucial
 92. (a) believe (b) accept
 (c) create (d) lift
 (e) add

93. (a) is (b) will (c) are (d) would (e) could
94. (a) trust (b) rely (c) believe (d) expect (e) try
95. (a) are (b) belong (c) demands (d) expect (e) harbour
96. (a) foster (b) seek (c) ask (d) built (e) collect
97. (a) broke (b) fall (c) degrade (d) destroyed (e) eliminate
98. (a) even (b) very (c) elaborate (d) much (e) enormous
99. (a) cautious (b) careful (c) worried (d) afraid (e) asking
100. (a) simplest (b) easier (c) real (d) contrast (e) wrong

RESPONSE SHEET

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Answer Key

1	(e)	11	(d)	21	(b)	31	(d)	41	(a)	51	(b)	61	(d)	71	(d)	81	(b)	91	(a)
2	(c)	12	(c)	22	(b)	32	(b)	42	(e)	52	(c)	62	(b)	72	(e)	82	(d)	92	(c)
3	(d)	13	(a)	23	(b)	33	(c)	43	(c)	53	(e)	63	(d)	73	(d)	83	(e)	93	(c)
4	(c)	14	(b)	24	(e)	34	(e)	44	(d)	54	(c)	64	(a)	74	(b)	84	(e)	94	(b)
5	(e)	15	(b)	25	(b)	35	(c)	45	(a)	55	(d)	65	(e)	75	(c)	85	(c)	95	(d)
6	(d)	16	(d)	26	(b)	36	(e)	46	(d)	56	(d)	66	(e)	76	(b)	86	(c)	96	(d)
7	(c)	17	(d)	27	(a)	37	(b)	47	(d)	57	(a)	67	(d)	77	(c)	87	(d)	97	(d)
8	(b)	18	(e)	28	(b)	38	(b)	48	(b)	58	(a)	68	(c)	78	(b)	88	(d)	98	(a)
9	(c)	19	(a)	29	(c)	39	(a)	49	(a)	59	(a)	69	(c)	79	(e)	89	(a)	99	(b)
10	(c)	20	(b)	30	(d)	40	(d)	50	(a)	60	(e)	70	(a)	80	(b)	90	(a)	100	(b)

Answers & Explanations

1. (e) $4\frac{1}{2} + \left(1 \div 2\frac{8}{9}\right) - 3\frac{1}{13} = ?$

$$4 + \frac{1}{2} + 1 \times \frac{9}{26} - \left(3 + \frac{1}{13}\right)$$

$$4 + \frac{1}{2} + \frac{9}{26} - 3 - \frac{1}{13}$$

$$1 + \frac{1}{2} - \frac{1}{13} + \frac{9}{26} = \frac{26 + 13 - 2 + 9}{26} = 1\frac{10}{13}$$

2. (c) $\frac{6 \times 136 \div 8 + 132}{628 \div 16 - 26.25}$

$$= \frac{6 \times 136 \times \frac{1}{8} + 132}{628 \times \frac{1}{16} - 26.25}$$

$$= \frac{102 + 132}{39.25 - 26.25} = \frac{234}{13} = 18$$

3. (d) $\{(441)^{1/2} \times 207 \times (343)^{1/3}\} \div \{(14)^2 \times (529)^{1/2}\}$
 $\{(21^2)^{1/2} \times 207 \times (7^3)^{1/3}\} \div \{(14)^2 \times (23^2)^{1/2}\}$
 $(21 \times 207 \times 7) \div ((14)^2 \times 23)$

$$\frac{21 \times 207 \times 7}{14 \times 14 \times 23} = 6\frac{3}{4}$$

4. (c) $\{\sqrt{7744} \times (11)^2\} \div (2)^3 = (?)^3$

$$\{88 \times (11)^2\} \div (2)^3$$

$$88 \times (11)^2 \times \frac{1}{8} = (11)^3$$

5. (e) $(4356)^{1/2} \div \frac{11}{4} = \sqrt{?} \times 6$

$$(66^2)^{1/2} \times \frac{4}{11}$$

$$66 \times \frac{4}{11} = 4 \times 6 = \sqrt{16} \times 6$$

$$? = 16$$

6. (d) $\frac{3}{8}$ of $\{4624 \div (564 - 428)\} = ?$

$$\frac{3}{8} \times \left\{4624 \times \frac{1}{136}\right\}$$

$$\frac{3}{8} \times 34 = 12\frac{3}{4}$$

7. (c) $456 \div 24 \times 38 - 958 + 364 = ?$

$$= 456 \times \frac{1}{24} \times 38 - 958 + 364 = 722 - 958 + 364$$

$$= 128$$

8. (b) $(43)^2 + 841 = (?)^2 + 1465$

$$1849 + 841 = (?)^2 + 1465$$

$$1225 = (?)^2$$

$$? = 35$$

9. (c) $3\frac{3}{8} \times 6\frac{5}{12} - 2\frac{3}{16} \times 3\frac{1}{2}$

$$\left(3 + \frac{3}{8}\right) \times \left(6 + \frac{5}{12}\right) - \left(2 + \frac{3}{16}\right) \times \left(3 + \frac{1}{2}\right)$$

$$\frac{27}{8} \times \frac{77}{12} - \frac{35}{16} \times \frac{7}{2}$$

$$\frac{2079}{96} - \frac{245}{32} = \frac{2079 - 735}{96} = 14$$

10. (c) $(34.5 \times 14 \times 42) \div 2.8$

$$= 34.5 \times 14 \times 42 \times \frac{1}{2.8}$$

$$= 7245$$

11. (d) $(216)^4 \div (36)^4 \times (6)^5 = (6)^?$
 $(6^3)^4 \div (6^2)^4 \times (6)^5$

$$(6^3)^4 \times \frac{1}{6^8} \times (6)^5$$

$$6^{12+5-8} = 6^9$$

12. (c) $\frac{\sqrt{4356} \times \sqrt{?}}{\sqrt{6084}} = 11$

$$\frac{\sqrt{66 \times 66} \times \sqrt{?}}{\sqrt{78 \times 78}} = 11$$

$$\frac{66 \times \sqrt{?}}{78} = 11$$

$$\sqrt{?} = \frac{11 \times 78}{66}$$

$$\sqrt{?} = 13$$

$$? = 169$$

13. (a) $\left(3\frac{6}{17} \div 2\frac{7}{34} - 1\frac{9}{25}\right) = (?)^2$

$$\frac{57}{17} \times \frac{34}{75} - \frac{34}{25}$$

$$\frac{19 \times 2}{25} - \frac{34}{25} = \frac{4}{25} = \left(\frac{2}{5}\right)^2$$

$$? = \frac{2}{5}$$

14. (b) $(1097.63 + 2197.36 - 260.24) \div 3.5$

$$(3294.99 - 2607.24) \times \frac{1}{3.5}$$

$$687.75 \times \frac{1}{3.5} = 196.5$$

15. (b) $\frac{1}{11} \times \left[(17424)^{\frac{1}{2}} \times \frac{1}{(66)^2} \times 3^3 \right]$

$$\frac{1}{11} \times \left[(132^2)^{\frac{1}{2}} \times \frac{1}{(66)^2} \times 3^3 \right]$$

$$\frac{1}{11} \times \frac{132}{(66)^2} \times 3^3 = \frac{2 \times 27^9}{11 \times 66} = \left(\frac{3}{11}\right)^2$$

16. (d) $\frac{A+12}{B+12} = \frac{3}{4}$

$$A = \frac{15}{4}C$$

$$A = \frac{15}{4} \times 10 = 37.5$$

$$\frac{37.5+12}{B+12} = \frac{3}{4}$$

$$B = 54$$

17. (d) Let x be the price of one capsule
y be the total number of capsule.

$$xy = 216 \quad \dots(1)$$

$$(x-10)(y+15) = 216 \quad \dots(2)$$

From eqs (1) and (2)

$$\left(\frac{216}{y} - 10\right)(y+15) = 216$$

$$(216 - 10y)(y+15) = 216y$$

$$216y + 216 \times 15 - 10y^2 - 150y = 216y$$

$$216y + 3240 - 10y^2 - 150y = 216y$$

$$-10y^2 - 150y + 3240 = 0$$

$$y^2 + 15y - 324 = 0$$

$$y = 12$$

18. (e) M's share = $44352 \times \frac{3}{8} = 16632$

Remaining after M's share = 27720

$$N's \text{ share} = 27720 \times \frac{1}{6} = 4620$$

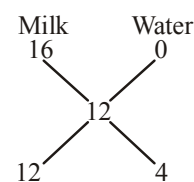
Remaining after M & N's share = 23100

$$\frac{O}{P} = \frac{3}{4} \Rightarrow O's \text{ share} = 23100 \times \frac{3}{7} = 9900$$

19. (a) \therefore SP of the mixture = ₹ 15

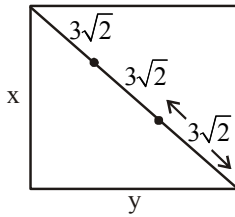
$$\therefore \text{CP of the mixture} = 15 \times \frac{100}{125} = ₹ 12$$

Now, by the rule of mixture,



\therefore Ratio of milk and water in the mixture
= 12 : 4 = 3 : 1

20. (b)

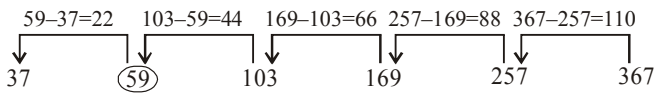


$$x^2 + y^2 = (9\sqrt{2})^2$$

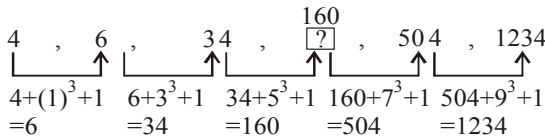
$$2x^2 = 81 \times 9$$

$$x = 9$$

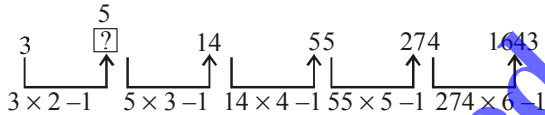
21. (b)



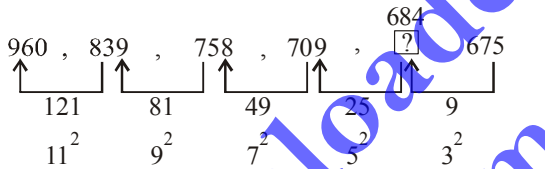
22. (b)



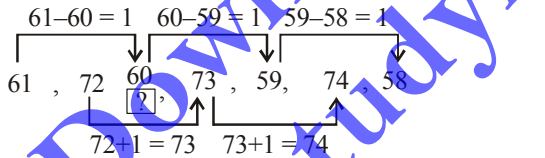
23. (b)



24. (e)



25. (b)



This is mixed series.

26. (b)

10 hr A pipe → 1
 16 hr B pipe → 1
 32 hr C pipe → 1

$$\frac{1}{10} + \frac{1}{16} + \frac{1}{32} = \frac{21}{160}$$

$$\frac{160}{21} = 7\frac{13}{21} \text{ hr}$$

27. (a)

Profit on all the goods = 18% of 6000 = ₹ 1080
 Profit on half of the goods = 12% of 3000 = ₹ 360
 ∴ Profit on remaining half of the objects
 = 1080 - 360 = ₹ 720

Hence, required profit percentage = $\frac{720}{3000} \times 100\%$
 = 24%

28. (b) $6B^2 = A^2 + 540$

$$\frac{A}{B} = \frac{3}{2}$$

$$A = \frac{3B}{2}$$

$$6B^2 = \frac{9B^2}{4} + 540$$

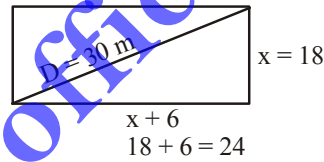
$$3.75B^2 = 540$$

$$B = \sqrt{144} = 12$$

29. (c) $x + x + x + 6 + x + 6 = 84$

$$4x + 12 = 84$$

$$x = 18 \text{ m}$$



$$D^2 = (x+6)^2 + x^2$$

$$D^2 = 24^2 + 18^2$$

$$D^2 = 576 + 324 = 900$$

$$D = 30 \text{ m}$$

Base of triangle = 30 m
 Height of triangle = $x + 6 = 24 \text{ m}$

$$\text{Area of triangle} = \frac{1}{2} \times 30 \times 24 = 360 \text{ m}^2$$

30. (d) Here, $M_1 = 56, D_1 = 14, M_2 = ?, D_2 = 8$

Using

$$M_1 D_1 = M_2 D_2,$$

$$56 \times 14 = M_2 \times 8$$

$$\Rightarrow M_2 = 98$$

Hence, extra workers to be required
 = $98 - 56 = 42$

31. (d) Ratio

$$= \frac{\text{number of pages printed by printer B in 2nd week}}{\text{number of pages printed by printer F in 5th week}}$$

32. (b) Average number of pages printed by all the printer =

$$= \frac{256 + 563 + 347 + 651 + 412 + 321}{6} = 425$$

33. (c)

Printer \ Week	A	B	C	D	E	F
1st	664	618	628	552	638	419
2nd	569	441	519	438	621	537
3rd	440	614	503	527	541	742
4th	256	263	347	651	412	321
5th	717	429	598	582	519	693
Total up to 5th week	2646	2365	2595	2750	2731	2712

Printer D printed maximum pages.

34. (e) Required percentage (%) =

$$= \frac{\text{Pages printed by A in 3rd week}}{\text{Total page printed by D from 1st to 5th weeks}} \times 100$$

$$= \frac{440}{2750} \times 100 = 16\%$$

35. (c) Required difference = Total no. of pages printed by printer C in all given weeks – Total no. of pages by E in 1st, 2nd, 4th week

$$= 2595 - (638 + 621 + 412) = 924$$

36. (e) Alive is different from the other four words. Walk, Cry, Play and Study are various actions of human being. Alive means 'living', 'not dead', 'in existence', 'continuing' etc.

37. (b) $\begin{matrix} 22 & 9 & 18 & 20 & 21 & I & 12 \\ V & I & R & T & U & A & L \end{matrix}$

38. (b) Meaningful word \Rightarrow LIP

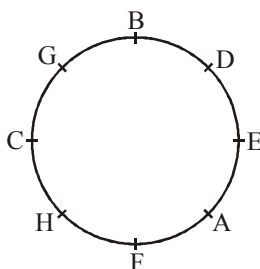
39. (a) $\begin{matrix} F & L & I & P & P & E & R \\ +1 \downarrow & -1 \downarrow & +1 \downarrow & -1 \downarrow & +1 \downarrow & -1 \downarrow & +1 \downarrow \\ G & K & J & O & Q & D & S \end{matrix}$

Mother
|
only child

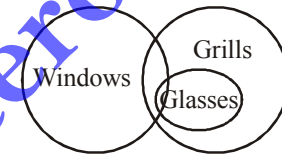
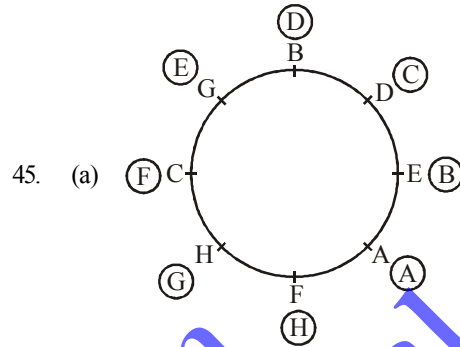
40. (d) Arun (Himself)
|
daughter/She

Therefore, the girl is the daughter of Arun.

(41-45):

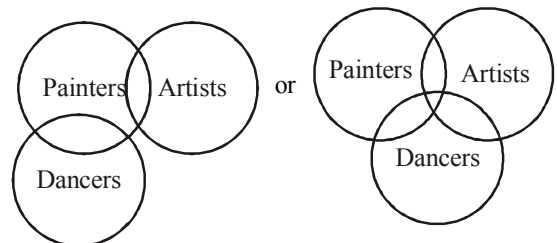


41. (a) D is to the immediate left of B.
 42. (e) B and C are immediate neighbours of G.
 43. (c) C is sitting just opposite to E. F is sitting just opposite to B. Similarly, A is sitting just opposite to G.
 44. (d) Except in the pair BE, in all other pairs the first person is second to the left of the second person. B is second to the right of E.



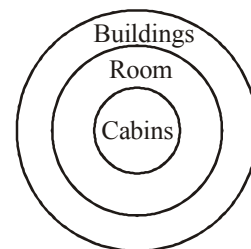
Conclusion-I : False
 II: False

47. (d)

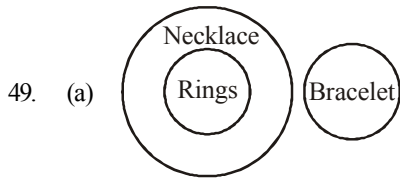


Conclusion-I : False
 II: False

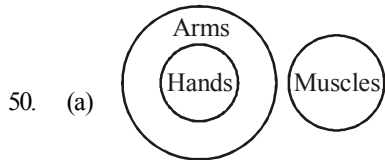
48. (b)



Conclusion-I : False
 II: True

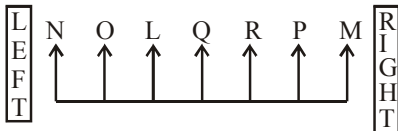


Conclusion-I : True
II: False

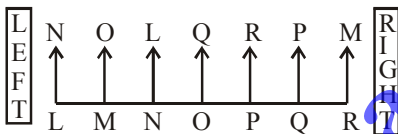


Conclusion-I : True
II: False

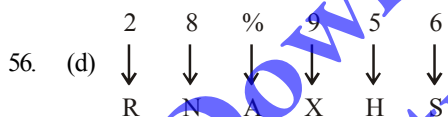
(51-55) :



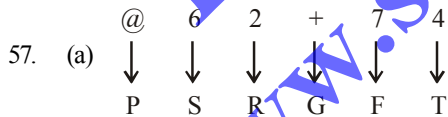
51. (b) O is third to the left of R.
52. (c) N and M are sitting at the extreme ends of the line.



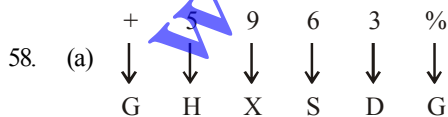
53. (e) Q is sitting exactly in the middle of the row.
54. (c) Except LN, in all others the first person is to immediate right of the second person. L is second to the right of N.



Condition (iii) is applicable.



Condition (i) is applicable.



Condition (ii) is applicable.

59. (a) $H > K \geq R > T > L$
Conclusions:
I. $H > L$: True
II. $K > T$: Not True

60. (e) $P = N > D \geq G < B = J$

Conclusions:

- I. $G < P$: True
II. $G < J$: True

61. (d) $F \leq C \geq V = Z > X = U$

Conclusions:

- I. $V < U$: Not True
II. $Z < F$: Not True

62. (b) $Q \leq E = I > N \geq R \geq S$

Conclusions :

- I. $E = S$: Not True
II. $S \leq N$: True

63. (d) In the expression $A > B \geq C \equiv D \leq E = F$ to make $A > D$ true and $F \geq C$ true.

64. (a) Trying option (a)

$$P > Q = R \leq T < S$$

$$\underbrace{P > R} \quad \underbrace{R \leq T}$$

$R < S$ As $Q = R$ so $Q < S$

Both the expressions are true in option (a)

65. (e) $P \times Q$ means P is a father of Q.

$Q + P$ means Q is daughter of R

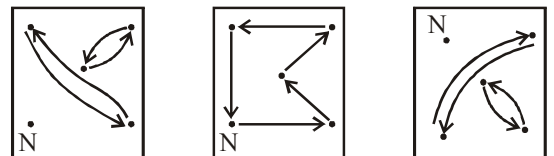
$R - T$ means R is sister of T.

It is clear that P is husband of R. If he establish that T is either son or daughter of S, then P would be son-in-law of S.

$T + S$ means T is daughter of S.

$T \div S$ means T is son of S.

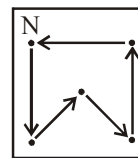
66. (e) Next figure of each question figure is changed by following way and N is replaced by a new design.



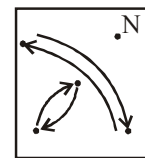
(1) to (2)

(2) to (3)

(3) to (4)



(4) to (5)

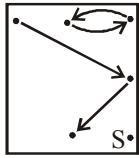


(5) to (6)

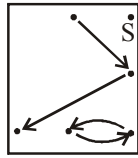
Similarly next figure is (e)

67. (d) In next figure of each question figure, there are two, three design in upper part and three, four design in lower part is eliminate and hence next figure is (d).

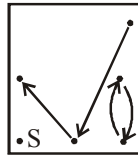
68. (c) Next figure of each question figure follows following ways



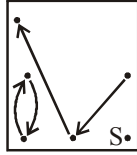
(1) to (2)



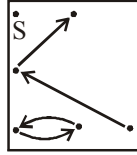
(2) to (3)



(3) to (4)



(4) to (5)



(5) to (6)

Accordingly next figure is (c)

69. (c) In next figure of each question figure there are 1, 2, 1, 2 line in left upper part are eliminated in each figure and 6, 5, 6, 5, line are added in forward most direction, and a square is made by four lines. Hence accordingly option (c) is next figure.
70. (a) Next figure of each question figure is rotated clockwise by 45° and one curve is added each side, hence accordingly next figure is (a).



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INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $1/4^{\text{th}}$ of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-10): What will come in place of the question mark (?) in the following questions?

- $(3325 \div 25) \times (152 \div 16) = ?$
 (a) 1269.4 (b) 1264.9
 (c) 1265.3 (d) 1263.5
 (e) None of these
- $\sqrt{3136} - \sqrt{1764} = \sqrt{?}$
 (a) 14 (b) $(196)^2$
 (c) -14 (d) 144
 (e) None of these
- $5\frac{1}{5} + 2\frac{2}{15} + 3\frac{2}{3} = ?$
 (a) 15 (b) 13
 (c) $\frac{11}{15}$ (d) 12
 (e) None of these
- $-15 - 27 - 88 - 63 + 255 = ?$
 (a) 55 (b) 74
 (c) 62 (d) 59
 (e) None of these
- $(2525 \times 0.25 \div 5) \times 7 = ?$
 (a) 889.43 (b) 883.75
 (c) 886.45 (d) 881.75
 (e) None of these
- $\frac{14}{19} \times \frac{57}{70} \times \frac{20}{21} = ?$
 (a) $\frac{2}{7}$ (b) $\frac{4}{7}$
 (c) $\frac{2}{9}$ (d) $\frac{3}{7}$
 (e) None of these
- $32\% \text{ of } 500 + 162\% \text{ of } 50 = ?$
 (a) 231 (b) 245
 (c) 237 (d) 247
 (e) None of these
- $45316 + 52131 - 65229 = ? + 15151$
 (a) 17063 (b) 17073
 (c) 17076 (d) 17067
 (e) None of these
- $\sqrt{25 - 12 + 155 + 1} = ?$
 (a) 13 (b) 14
 (c) 17 (d) 16
 (e) None of these
- $\frac{184 \times 4}{23 \text{ of } 400} = ?$
 (a) 7 (b) 9
 (c) 8 (d) 5
 (e) None of these
- Joel purchased 40 notebooks at the rate of ₹ 18 per notebook and 55 pencils at the rate of ₹ 8 per pencil. What is the total amount that he paid to the shopkeeper?
 (a) ₹ 1,165 (b) ₹ 1,160
 (c) ₹ 1,166 (d) ₹ 1,161
 (e) None of these
- The sum of five consecutive odd numbers is 265. What is the sum of the largest number and twice the smallest number?
 (a) 156 (b) 153
 (c) 155 (d) 151
 (e) None of these

13. The average of five numbers is 34.4. The average of the first and the second number is 46.5. The average of the fourth and the fifth number is 18. What is the third number?
 (a) 45 (b) 46
 (c) 42 (d) 49
 (e) None of these
14. One of the angles of a parallelogram is 45° . What will be the sum of the larger angle and twice the smaller angle of the parallelogram?
 (a) 228° (b) 224°
 (c) 225° (d) 222°
 (e) None of these
15. 9 women can complete a piece of work in 19 days. How many days will 18 women take to complete the same piece of work?
 (a) 12 days (b) 6.5 days
 (c) 9 days (d) 8.5 days
 (e) None of these
16. If $(11)^3$ is subtracted from $(46)^2$ what will be the remainder?
 (a) 787 (b) 785
 (c) 781 (d) 783
 (e) None of these
17. The ratio between Gloria's and Sara's present ages is 4 : 7 respectively. Two years ago the ratio between their ages was 1 : 2 respectively. What will be Sara's age three years hence?
 (a) 17 years (b) 14 years
 (c) 11 years (d) 8 years
 (e) None of these
18. A plot of 1800 sq. ft. is available at the rate of ₹ 630 per sq. ft. If 45% of the total cost of the plot is to be paid at the time of booking it, how much is the booking amount?
 (a) ₹ 11,34,0007 (b) ₹ 5,10,8007
 (c) ₹ 6,03,0007 (d) ₹ 6,00,300
 (e) None of these
19. 'A', 'B' and 'C' are three consecutive even integers such that four times 'A' is equal to three times 'C'. What is the value of B?
 (a) 12 (b) 10
 (c) 16 (d) 14
 (e) None of these
20. The sum of the squares of two odd numbers is 11570. The square of the smaller number is 5329. What is the other number?
 (a) 73 (b) 75
 (c) 78 (d) 79
 (e) None of these
21. What is the difference between the simple and compound interest earned from a sum of ₹ 13,033 at a rate of 13 percent per annum for a period of 3 years (rounded off to 2 digits after decimal)?
 (a) ₹ 5,082.87 (b) ₹ 689.41
 (c) ₹ 5,772.28 (d) ₹ 680.94
 (e) None of these
22. The sum of three consecutive integers is 5685. Which of the following is the correct set of these numbers?
 (a) 1893, 1894, 1895 (b) 1895, 1896, 1897
 (c) 1899, 1900, 1901 (d) 1897, 1898, 1899
 (e) None of these
23. A factory produces 1515 items in 3 days. How many items will they produce in a week?
 (a) 3530 (b) 3553
 (c) 3533 (d) 3535
 (e) None of these
24. How much will a sum of ₹ 12,0007 deposited at a rate of 9% per annum (simple interest) for 13 years amount to?
 (a) ₹ 14,040 (b) ₹ 20,650
 (c) ₹ 13,404 (d) ₹ 27,800
 (e) ₹ 26,040
25. If the following fractions are arranged in a descending order (from left to right), which of them will be second from the right end?
 $\frac{4}{9}, \frac{6}{13}, \frac{5}{11}, \frac{13}{16}, \frac{7}{12}$
 (a) $\frac{6}{13}$ (b) $\frac{4}{9}$
 (c) $\frac{13}{16}$ (d) $\frac{7}{12}$
 (e) $\frac{5}{11}$

DIRECTIONS (Qs. 26-28) : What should come in place of the question mark (?) in the following number series?

26. 800 400 200 100 50 ?
 (a) 20 (b) 30
 (c) 25 (d) 35
 (e) None of these
27. 2 13 35 68 112 ?
 (a) 173 (b) 178
 (c) 163 (d) 167
 (e) None of these
28. 650 601 565 540 524 ?
 (a) 512 (b) 514
 (c) 511 (d) 515
 (e) None of these

DIRECTIONS (Qs. 29-30) : In the following number series only one number is wrong. Find out the wrong number.

29. 9050 5675 3478 2147 1418 1077 950
 (a) 3478 (b) 1418
 (c) 5675 (d) 2147
 (e) 1077
30. 8424 4212 2106 1051 526.5 263.25 131.625
 (a) 131.625 (b) 1051
 (c) 4212 (d) 8424
 (e) 263.25
31. Rubina could get equal number of ₹ 55, ₹ 85 and ₹ 105 tickets for a movie. She spends ₹ 2940 for all the tickets. How many of each did she buy?
 (a) 12 (b) 14
 (c) 16 (d) Cannot be determined
 (e) None of these

32. Ramola's monthly income is three times Ravina's monthly income. Ravina's monthly income is fifteen percent more than Ruchira's monthly income. Ruchira's monthly income is ₹ 32,000. What is Ramola's annual income ?
 (a) ₹ 1,10,400 (b) ₹ 13,24,800
 (c) ₹ 36,800 (d) ₹ 52,200
 (e) None of these
33. In an Entrance Examination Ritu scored 56 percent marks, Smita scored 92 percent marks and Rina scored 634 marks. The maximum marks of the examination are 875. What are the average marks scored by all the three girls together?
 (a) 1929 (b) 815
 (c) 690 (d) 643
 (e) None of these
34. The respective ratio between the present age of Manisha and Deepali is 5 : X. Manisha is 9 years younger than Parineeta. Parineeta's age after 9 years will be 33 years. The difference between Deepali's and Manisha's age is same as the present age of Parineeta. What will come in place of X?
 (a) 23 (b) 39
 (c) 15 (d) Cannot be determined
 (e) None of these
35. Seema bought 20 pens, 8 packets of wax colours, 6 calculators and 7 pencil boxes. The price of one pen is ₹ 7, one packet of wax colour is ₹ 22, one calculator is ₹ 175 and one pencil box is ₹ 14 more than the combined price of one pen and one packet of wax colours. How much amount did Seema pay to the shopkeeper?
 (a) ₹ 1,491 (b) ₹ 1,725
 (c) ₹ 1,667 (d) ₹ 1,527
 (e) None of these

REASONING ABILITY

36. A school bus driver starts from the school, drives 2 km towards North, takes a left turn and drives for 5 km. He then takes a left turn and drives for 8 km before taking a left turn again and driving for 5 km. The driver finally takes a left turn and drives 1 km before stopping. How far and towards which direction should the driver drive to reach the school again?
 (a) 3 km towards North (b) 7 km towards East
 (c) 6 km towards South (d) 6 km towards West
 (e) 5 km towards North

DIRECTIONS (Qs. 37-38) : Read the following information carefully and answer the questions which follow:

A, B, C, D, E and F live on different floors in the same building having six floors numbered one to six (the ground floor is numbered 1, the floor above it, number 2 and so on and the topmost floor is numbered 6).

A lives on an even numbered floor. There are two floors between the floors on which D and F live. F lives on a floor above D's floor. D does not live on floor number 2. B does not live on an odd numbered floor. C does not live on any of the floors below F's floor. E does not live on a floor immediately above or immediately below the floor on which B lives.

37. Who amongst the following live on the floors exactly between D and F ?
 (a) E, B (b) C, B
 (c) E, C (d) A, E
 (e) B, A

38. On which of the following floors does B live?
 (a) 6th (b) 4th
 (c) 2nd (d) 5th
 (e) Cannot be determined

DIRECTIONS (Qs. 39-40) : Study the following information to answer the given questions:

In a five letter English word (which may or may not be a meaningful English word), there are two letters between L and P. S is not placed immediately next to L. There is only one letter between S and A. S is towards the right of A. S is not placed immediately next to E.

39. Which of the following is correct with respect to the word thus formed?
 (a) E is at one of the extreme ends of the word.
 (b) P is not placed immediately next to A.
 (c) There are two letters between A and E in the word thus formed.
 (d) P is placed second to the right of E.
 (e) None is correct
40. Which of the following words will be formed based on the given conditions?
 (a) SPAEL (b) PEALS
 (c) LEAPS (d) SEPAL
 (e) LAPSE

DIRECTIONS (Qs. 41-45) : In each question below are two/three statements followed by two conclusions numbered I and II. You have to take the two/three given statements to be true even if they seem to be at variance from commonly known facts and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

Give answer (a) if only conclusion I follows

Give answer (b) if only conclusion II follows.

Give answer (c) if either conclusion I or conclusion II follows.

Give answer (d) if neither conclusion I nor conclusion II follows.

Give answer (e) if both conclusion I and conclusion II follow.

(Qs. 41-43) :

Statements : All gliders are parachutes.

No parachute is an airplane.

All airplanes are helicopters.

41. Conclusions : I. No glider is an airplane.
 II. All gliders being helicopters is a possibility.
42. Conclusions : I. No helicopter is a glider.
 II. All parachutes being helicopters is a possibility.
43. Statements : Some mails are chats.
 All updates are chats.
 Conclusions : I. All mails being updates is a possibility.
 II. No update is a mail.

(Qs. 44-45) :

Statement : No stone is metal.

Some metals are papers.

All papers are glass.

44. Conclusions : I. All stones being glass is a possibility.
II. No stone is a paper.
45. Conclusions : I. No glass is a metal.
II. Atleast some glass is metal.

DIRECTIONS (Qs. 46-50) : Each of the questions below consists of a question and three statements numbered I, II and III given below it. You have to decide whether the data provided in the statements are sufficient to answer the question.

46. How many daughters does W have?
I. B and D are sisters of M.
II. M's father T is husband of W.
III. Out of the three children which T has, only one is a boy.
(a) Only I and III
(b) All I, II and III are required to answer the question
(c) Only II & III are sufficient to answer the question
(d) Question cannot be answered even with all I, II and III
(e) Only I and II
47. Who among A, B, C, D, E and F each having a different height, is the tallest?
I. B is taller than A but shorter than E.
II. Only two of them are shorter than C.
III. D is taller than only F.
(a) Only I and II
(b) Only I and III
(c) Only II and III
(d) All I, II and III are required to answer the question
(e) All I, II and III are not sufficient to answer the question
48. How is 'go' written in a code language?
I. 'now or never again' is written as 'tom ka na sa' in that code language.
II. 'you come again now' is written as 'a ka ta sa' in that code language.
III. 'again go now or never' is written as 'na ho ka sa tom' in that code language.
(a) Only I and III
(b) Only II and III
(c) Only I and II
(d) All I, II and III are required to answer the question
(e) None of these
49. Towards which direction is village J from village W ?
I. Village R is to the west of Village W and to the north of Village T.
II. Village Z is to the east of Village J and to the south of Village T.
III. Village M is to the northeast of Village J and north of Village Z.
(a) Only III (b) Only II and III
(c) All I, II and III are required to answer the question
(d) Question cannot be answered even with all I, II and III
(e) None of these
50. On which day of the week starting from Monday did Suresh visit Chennai ?
I. Suresh took leave on Wednesday.
II. Suresh visited Chennai the day after his mother's visit to his house
III. Suresh's mother visited Suresh's house neither on Monday nor on Thursday

- (a) Only II and III
(b) Only I and II
(c) Only I and III
(d) All I, II and III are required to answer the question
(e) Question cannot be answered even with all I, II and III

DIRECTIONS (Qs 51- 55): Study the information below and answer questions based on it.

Twelve people are sitting in two parallel rows containing six people each, in such a way that there is an equal distance between adjacent persons. In rows 1 there are p, q, r, s, t, and v are seated and all of them are facing south. In row 2 there are a, b, c, d, e, and f are seated and all of them are facing north. Therefore, in the given seating arrangement each member seated in a row faces another member of the other row.

1. a, sits third to right of d
2. Neither a nor d sits at the extremes ends
3. 't' faces 'd'
4. v does not face a and v does not sit at any of the extreme ends.
5. 'v' is not an immediate neighbor of t.
6. 'b' sit at on the extreme ends.
7. Only two people sit between b and e
8. 'e' does not face v
9. Two persons sit between r and q
10. r is not the immediate neighbor of t
11. c does not face v
12. p is not an immediate neighbor of r
51. Who among the following sit at extreme ends of the rows?
(a) b,e (b) s,t
(c) p,r (d) b,f
(e) none
52. Who among the following faces a?
(a) r (b) t
(c) p (d) q
(e) s
53. How many persons are seated between t and s?
(a) one (b) two
(c) three (d) four
(e) none
54. p is related to v in the same way as the c is related to f. To which of the following is e related to, following the same pattern:
(a) b (b) d
(c) c (d) a
(e) none
55. Which of the following is true regarding f?
(a) f sits second to the right of c
(b) f is not an immediate neighbor of a
(c) f sits third to the left of d
(d) f sits at the one of the extreme ends of the line
(e) f faces v

DIRECTIONS (Qs. 56 - 60) : Study the information below and answer questions based on it.

P, Q, R, S, T, V, Wand Z are travelling to three destinations Delhi, Chennai and hyderabad in three different vehicles-Honda City, Swift D'Zire and Ford Ikon. There are three females among them one in each car. There are at least two persons in each car. R is not

travelling with Q and W. T, a male, is travelling with only Z and they are not travelling to Chennai. P is travelling in Honda City to Hyderabad. S is sister of P and travels by Ford Ikon. V and R travel together. W does not travel to Chennai.

56. Members travelling to Chennai are in the car:
 (a) Honda City (b) Swift D'Zire
 (c) Ford Ikon
 (d) Either Swift D'Zire or Ford Ikon
 (e) None of these
57. In which car are four members travelling?
 (a) None (b) Honda City
 (c) Swift D'Zire (d) Ford Ikon
 (e) Honda City or Ford Ikon
58. Which of the following combinations represents the three female members?
 (a) QSZ (b) WSZ
 (c) PSZ (d) Cannot be determined
 (e) None of these
59. Who is travelling with W?
 (a) Only Q (b) Only P
 (c) Both P and Q (d) Cannot be determined
 (e) None of these
60. Members in which of the following combinations are travelling in Honda City?
 (a) PRS (b) PQW
 (c) PWS (d) Data inadequate
 (e) None of these

DIRECTIONS (Qs. 61-65) : In the following questions the symbols @, ⊕, =, ⊙ and ⊖ are used with the following meaning:

- $P \odot Q$ means P is less than Q .
- $P @ Q$ means P is greater than Q .
- $P \oplus Q$ means P is greater than or equal to Q .
- $P = Q$ means P is equal to Q .
- $P \ominus Q$ means P is either smaller than or equal to Q .

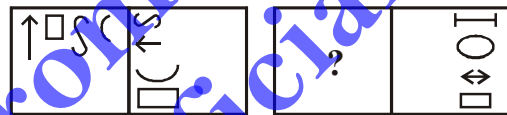
Now in each of the following questions, assuming the given statements to be true, find which of the two conclusions I and II given below them is/are definitely true? Give answer.

- (a) if only conclusion I is true.
 (b) if only conclusion II is true.
 (c) if either I or II is true.
 (d) if neither I nor II is true, and
 (e) if both I and II are true.
61. **Statements:** $B @ V, K \odot C, C \ominus B$
Conclusions : I. $V @ C$
 II. $B @ K$
62. **Statements :** $K @ T, S = K, T \ominus R$
Conclusions : I. $S @ R$
 II. $T = R$

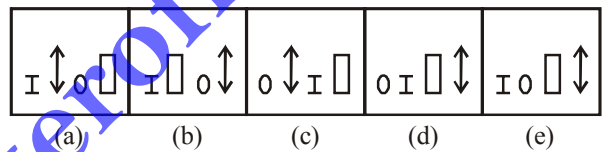
63. **Statements :** $U = M, P \oplus U, M \oplus B$
Conclusions : I. $P = B$
 II. $P @ B$
64. **Statements:** $L \oplus N, J \ominus P, P \oplus L$
Conclusions : I. $J = L$
 II. $P = N$
65. **Statements:** $H \oplus G, D @ E, H = E$
Conclusions : I. $D @ H$
 II. $G \odot D$

DIRECTIONS (Qs. 66-70) : The first figure in the first unit of the problem figures bears a certain relationship to the second figure. Similarly one of the figures in the answer figures bears the same relationship to the second figure in the second unit of the problem figures. You are therefore to locate the figure which would fit in the question mark.

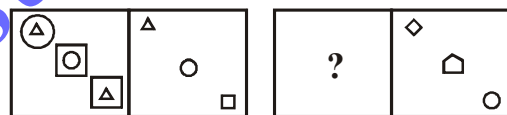
66. **PROBLEM FIGURES**



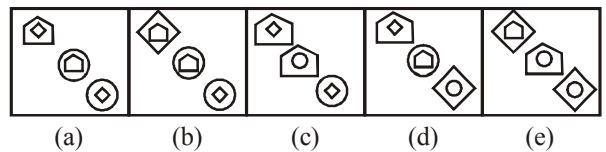
ANSWER FIGURES



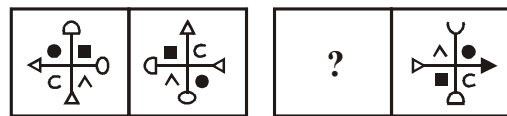
67. **PROBLEM FIGURES**



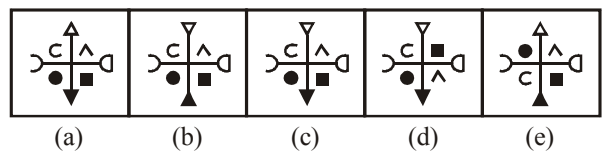
ANSWER FIGURES



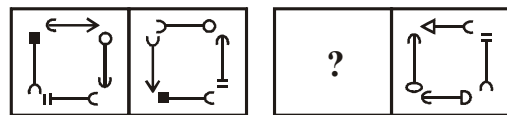
68. **PROBLEM FIGURES**



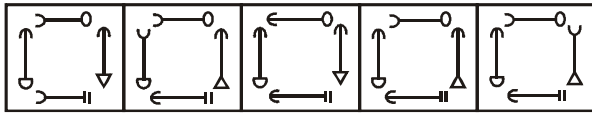
ANSWER FIGURES



69. **PROBLEM FIGURES**

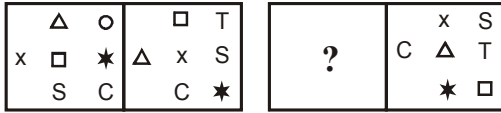


ANSWER FIGURES



(a) (b) (c) (d) (e)

70. PROBLEM FIGURES



ANSWER FIGURES



(a) (b) (c) (d) (e)

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-75): In each of the following sentences, an idiomatic expression or a proverb is highlighted. Select the alternative which best describes its use in the sentence.

71. The stunt that I recently attempted was a **piece of cake**.
- (a) The stunt that I recently attempted was enjoyable to watch.
- (b) The stunt that I recently attempted was very challenging.
- (c) The stunt that I recently attempted was celebrated by all.
- (d) The stunt that I recently attempted turned out to be a failure.
- (e) The stunt that I recently attempted was a simple task.
72. The boy broke the window and **took to his heels**.
- (a) The boy broke the window and fell on his heels.
- (b) The boy broke the window and ran away.
- (c) The boy broke the window with his heels.
- (d) The boy ran into the window.
- (e) The boy broke the window and robbed a pair of heels.
73. I **pledged myself** to serve the king faithfully.
- (a) I made a mistake by promising to serve the king faithfully.
- (b) I made a fool of myself in order to serve the king.
- (c) I boasted about serving the king faithfully.
- (d) I was forcibly made to serve the king.
- (e) I made a solemn and formal promise to serve the king faithfully.
74. There is a **crying need** for improvements to our public transport system.
- (a) There is an obvious need for improvements to our public transport system.
- (b) There is a well documented need for improvements to our public transport system.
- (c) There is a minor need for improvements to our public transport system.
- (d) There is a serious need for improvements to our public transport system.
- (e) There is no urgency for improvements to our public transport system.

75. In an old bookshop I happened to **light upon** a volume that belonged to my grandfather.
- (a) In an old bookshop I happened to discard a volume that belonged to my grandfather.
- (b) In an old bookshop I happened to purchase a volume that belonged to my grandfather.
- (c) In an old bookshop I happened to look for a volume that belonged to my grandfather.
- (d) In an old bookshop I happened to discover by chance a volume that belonged to my grandfather.
- (e) In an old bookshop I happened to reveal a volume that belonged to my grandfather.

DIRECTIONS (Qs. 76-80): Pick out the most effective word/phrases from the given alternatives marked (a), (b), (c), (d) and (e) given below each sentence to fill in the blank to make the sentence meaningful and grammatically correct.

76. By the middle of the 19th Century, the urban population of England _____ the rural population.
- (a) have exceed (b) exceeded
- (c) was to exceeds (d) exceeds
- (e) will exceed
77. The house that the actress lives in is beautiful, but the surroundings are _____ unpleasant.
- (a) quite (b) more and more
- (c) a little quite (d) very little
- (e) quite few
78. My friend and I decided to watch a play, however _____ enjoyed it.
- (a) hardly of us (b) some few of us
- (c) we scarcely only (d) neither of us
- (e) no one of us
79. It is difficult to speak a language fluently unless _____ regularly.
- (a) it is in practice (b) it is by practising
- (c) it will be practised (d) it is practised
- (e) it had been practised.
80. By the time he was eighteen years old, Peter _____ to make a living and support his family.
- (a) begins (b) began
- (c) started beginning (d) would begin
- (e) has just begun

DIRECTIONS (Qs. 81-85): Read the following passage carefully and answer the questions given below it.

Lumbini is a beautiful place in the southern part of Nepal. About 2,500 years ago, a baby boy was born to the king and queen. The baby was named Siddharth. His mother, died when he was five days old. The baby boy grew into a **handsome** prince. His father tried to keep him happy. The little prince had everything he needed — fine clothes, the best food and good toys. But he was not interested in them. He wanted to be alone and was always found in deep thought. Later, he was married to a beautiful princess. She was called Yashodhara. They had a son and named him Rahul. The king hoped that Siddharth would become a great ruler.

One day Siddharth was driving through the street in his chariot. He saw an old man and then a sick man. The oldman could **hardly** walk. The sick man groaned in pain. Then he saw some people carrying a dead body, others were wailing and

weeping at the loss of a dear one. Siddharth was very upset to see so much suffering and unhappiness. He was shocked. Then he saw an entirely different sight. A man in yellow robes was walking along the street. There was no trace of sadness on his **radiant** face, instead it shone with peace. He was a monk who had given up the world to escape the misery of life.

Siddharth wanted to find out why there was so much suffering in the world. He wanted to find out how men could be free of misery. He could find neither peace nor happiness in the life he was leading at the palace. One night Siddharth left his home, his wife and his little son. He went into the forest. He wanted to search for a way out of suffering and sorrow for all mankind. He meditated and got enlightenment. He became Lord Buddha, the enlightened one. Truth was **revealed to** him and he learnt all the secrets of life and the world.

He found out that the world was full of sorrow and unhappiness. The reason for it was greed and selfishness. To be free from suffering, we must be free from greed and desire. Desire is the **root** cause of all human suffering. He advocated the Middle Path and asked his followers to avoid the two extremes.

81. Which of the following sentences is **true** according to the passage?
- Lord Budha was born in Lumbini.
 - The little boy was very happy with fine clothes, good food and toys.
 - Siddharth divorced his first wife.
 - Siddharth and Yashodhara had no children and so they were very unhappy.
 - None of these
82. What was Siddharth interested in as a child ?
- He was interested in making new friends as he did not have any siblings.
 - His interests were largely in studying and reading books.
 - He was interested in the best of clothes and good toys.
 - In spending time alone in deep thought.
 - In spending time with nature.
83. Which of the following can be inferred about Siddharth ?
- Siddharth was different from other princes his age.
 - Siddharth was a spoilt child.
 - Siddharth was lonely because he did not have a mother.
- Only (A)
 - Only (B)
 - Only (C)
 - Only (B) and (C)
 - All (A), (B) and (C)
84. What did the King wish for his son, Siddharth ?
- He wanted Siddharth to become a great ruler.
 - He wished that Siddharth would not marry Yashodhara.
 - He wished that Siddharth's son would take over his kingdom.
 - He wished that Siddharth would behave like the other princes.
 - He wished that Siddharth would find the answer to all the suffering in the world.
85. What incident changed Siddharth's life forever ?
- His mother's death.
 - The incident where he saw a monk free from the misery of life.
 - The birth of his son
 - His marriage to Yashodhara.
 - The time he met Lord Buddha.
86. Why did Siddharth leave his home?
- He wanted to run away from his wife and son
 - He did not want to become heir to his father's throne
 - He was in search of a bigger kingdom
 - He wanted to see the world
 - He wanted to search for a way out of suffering and spend time in meditation.
87. According to Siddharth what was the reason for suffering and unhappiness in the world?
- The increased number of deaths
 - The advocacy of the Middle Path
 - Human greed and selfishness
 - People were unaware of the benefits of meditation.
 - None of these
88. What according to passage is the root cause for all human suffering?
- Desire
 - Happiness
 - Meditation
- Only (A)
 - Only (B) and (C)
 - Only (B)
 - Only (C)
 - All (A), (B) and (C)
89. Why was Siddharth called the enlightened one ?
- He was smarter than all the princes of his age.
 - He was the King's son.
 - Truth was revealed to him through meditation.
 - He had a great ability to resist temptation
 - He always wanted to be left alone
90. Why did Lord Buddha advocate the Middle Path ?
- He believed that it was the only way to eliminate poverty.
 - He believed that it was the only way of obtaining true happiness.
 - He was a staunch believer of living an extreme life.
 - He did not have a happy life being a prince.
 - He was not a risk-taker.

DIRECTIONS (Qs. 91-93) : Choose the word which is most nearly the SAME in meaning as the word printed in bold as used in the passage.

91. **Root**
- Secondary
 - Burning
 - Main
 - Common
 - True
92. **Hardly**
- Easily
 - Suddenly
 - Readily
 - Barely
 - Carefully
93. **Radiant**
- Full
 - Burning
 - Sickly
 - Happy
 - Sober

DIRECTIONS (Qs. 94 & 95) : Choose the word which is most OPPOSITE in meaning to the word printed in bold as used in the passage.

94. **Revealed to**
- Hidden from
 - Presented to
 - Obtained from
 - Exposed to
 - Manifested from

95. Handsome

- (a) Dear (b) Ugly
(c) Precious (d) Spoilt
(e) Attractive

DIRECTIONS (Qs. 96-100) : Read each sentence to find out whether there is any grammatical error in it. The error, if any, will be in one part of the sentence. The number of that part is the answer. If there is no error, the answer is (e) i.e. 'No Error', (Ignore the errors of punctuation, if any).

96. If tomorrow is (a)/ declared a holiday, (b)/ we shall go (c)/ to a picnic. (d)/ No Error (e)
97. My grandfather used (a)/ to go (b)/ for a walk (c)/ every morning. (d)/ No Error (e)
98. The blast from (a)/ the explosion (b)/ knocked the factory worker (c)/ to unconsciousness. (d)/ No Error (e)
99. Raju found it difficult (a)/ to explain (b)/ his final exam marks (c)/ to his parents. (d)/ No Error (e)
100. My friend become (a)/terribly upset (b)/ after losing her purse (c)/ at the supermarket. (d)/ No Error (e)

RESPONSE SHEET

- | | | | | | | | | | |
|-----|---------------------|-----|---------------------|-----|---------------------|-----|---------------------|------|---------------------|
| 1. | (a) (b) (c) (d) (e) | 2. | (a) (b) (c) (d) (e) | 3. | (a) (b) (c) (d) (e) | 4. | (a) (b) (c) (d) (e) | 5. | (a) (b) (c) (d) (e) |
| 6. | (a) (b) (c) (d) (e) | 7. | (a) (b) (c) (d) (e) | 8. | (a) (b) (c) (d) (e) | 9. | (a) (b) (c) (d) (e) | 10. | (a) (b) (c) (d) (e) |
| 11. | (a) (b) (c) (d) (e) | 12. | (a) (b) (c) (d) (e) | 13. | (a) (b) (c) (d) (e) | 14. | (a) (b) (c) (d) (e) | 15. | (a) (b) (c) (d) (e) |
| 16. | (a) (b) (c) (d) (e) | 17. | (a) (b) (c) (d) (e) | 18. | (a) (b) (c) (d) (e) | 19. | (a) (b) (c) (d) (e) | 20. | (a) (b) (c) (d) (e) |
| 21. | (a) (b) (c) (d) (e) | 22. | (a) (b) (c) (d) (e) | 23. | (a) (b) (c) (d) (e) | 24. | (a) (b) (c) (d) (e) | 25. | (a) (b) (c) (d) (e) |
| 26. | (a) (b) (c) (d) (e) | 27. | (a) (b) (c) (d) (e) | 28. | (a) (b) (c) (d) (e) | 29. | (a) (b) (c) (d) (e) | 30. | (a) (b) (c) (d) (e) |
| 31. | (a) (b) (c) (d) (e) | 32. | (a) (b) (c) (d) (e) | 33. | (a) (b) (c) (d) (e) | 34. | (a) (b) (c) (d) (e) | 35. | (a) (b) (c) (d) (e) |
| 36. | (a) (b) (c) (d) (e) | 37. | (a) (b) (c) (d) (e) | 38. | (a) (b) (c) (d) (e) | 39. | (a) (b) (c) (d) (e) | 40. | (a) (b) (c) (d) (e) |
| 41. | (a) (b) (c) (d) (e) | 42. | (a) (b) (c) (d) (e) | 43. | (a) (b) (c) (d) (e) | 44. | (a) (b) (c) (d) (e) | 45. | (a) (b) (c) (d) (e) |
| 46. | (a) (b) (c) (d) (e) | 47. | (a) (b) (c) (d) (e) | 48. | (a) (b) (c) (d) (e) | 49. | (a) (b) (c) (d) (e) | 50. | (a) (b) (c) (d) (e) |
| 51. | (a) (b) (c) (d) (e) | 52. | (a) (b) (c) (d) (e) | 53. | (a) (b) (c) (d) (e) | 54. | (a) (b) (c) (d) (e) | 55. | (a) (b) (c) (d) (e) |
| 56. | (a) (b) (c) (d) (e) | 57. | (a) (b) (c) (d) (e) | 58. | (a) (b) (c) (d) (e) | 59. | (a) (b) (c) (d) (e) | 60. | (a) (b) (c) (d) (e) |
| 61. | (a) (b) (c) (d) (e) | 62. | (a) (b) (c) (d) (e) | 63. | (a) (b) (c) (d) (e) | 64. | (a) (b) (c) (d) (e) | 65. | (a) (b) (c) (d) (e) |
| 66. | (a) (b) (c) (d) (e) | 67. | (a) (b) (c) (d) (e) | 68. | (a) (b) (c) (d) (e) | 69. | (a) (b) (c) (d) (e) | 70. | (a) (b) (c) (d) (e) |
| 71. | (a) (b) (c) (d) (e) | 72. | (a) (b) (c) (d) (e) | 73. | (a) (b) (c) (d) (e) | 74. | (a) (b) (c) (d) (e) | 75. | (a) (b) (c) (d) (e) |
| 76. | (a) (b) (c) (d) (e) | 77. | (a) (b) (c) (d) (e) | 78. | (a) (b) (c) (d) (e) | 79. | (a) (b) (c) (d) (e) | 80. | (a) (b) (c) (d) (e) |
| 81. | (a) (b) (c) (d) (e) | 82. | (a) (b) (c) (d) (e) | 83. | (a) (b) (c) (d) (e) | 84. | (a) (b) (c) (d) (e) | 85. | (a) (b) (c) (d) (e) |
| 86. | (a) (b) (c) (d) (e) | 87. | (a) (b) (c) (d) (e) | 88. | (a) (b) (c) (d) (e) | 89. | (a) (b) (c) (d) (e) | 90. | (a) (b) (c) (d) (e) |
| 91. | (a) (b) (c) (d) (e) | 92. | (a) (b) (c) (d) (e) | 93. | (a) (b) (c) (d) (e) | 94. | (a) (b) (c) (d) (e) | 95. | (a) (b) (c) (d) (e) |
| 96. | (a) (b) (c) (d) (e) | 97. | (a) (b) (c) (d) (e) | 98. | (a) (b) (c) (d) (e) | 99. | (a) (b) (c) (d) (e) | 100. | (a) (b) (c) (d) (e) |

Answer Key

1	(d)	11	(b)	21	(b)	31	(a)	41	(a)	51	(a)	61	(b)	71	(e)	81	(a)	91	(e)
2	(e)	12	(c)	22	(e)	32	(b)	42	(b)	52	(e)	62	(d)	72	(b)	82	(d)	92	(b)
3	(e)	13	(e)	23	(d)	33	(d)	43	(d)	53	(b)	63	(c)	73	(e)	83	(a)	93	(b)
4	(c)	14	(c)	24	(e)	34	(e)	44	(a)	54	(a)	64	(d)	74	(d)	84	(a)	94	(a)
5	(b)	15	(e)	25	(e)	35	(c)	45	(b)	55	(e)	65	(e)	75	(d)	85	(b)	95	(b)
6	(b)	16	(b)	26	(c)	36	(e)	46	(c)	56	(c)	66	(b)	76	(b)	86	(e)	96	(d)
7	(e)	17	(a)	27	(d)	37	(d)	47	(d)	57	(a)	67	(a)	77	(a)	87	(c)	97	(e)
8	(d)	18	(b)	28	(d)	38	(a)	48	(a)	58	(d)	68	(c)	78	(d)	88	(a)	98	(a)
9	(a)	19	(d)	29	(e)	39	(d)	49	(e)	59	(c)	69	(a)	79	(d)	89	(c)	99	(b)
10	(c)	20	(d)	30	(c)	40	(c)	50	(e)	60	(b)	70	(b)	80	(b)	90	(b)	100	(a)

Answers & Explanations

1. (d) Given expression implies $? = \frac{3325}{25} \times \frac{152}{16}$
 $= 133 \times 9.5 = 1263.5$

2. (e) $\sqrt{3136} - \sqrt{1764} = \sqrt{?}$
 $\Rightarrow 56 - 42 = \sqrt{?}$
 $\Rightarrow \sqrt{?} = 14$

On squaring both the side
 $\therefore ? = 14 \times 14 = 196$

3. (e) $? = 5 + \frac{1}{5} + 2 + \frac{2}{15} + 3 + \frac{2}{3}$
 $= 10 + \frac{1}{5} + \frac{2}{15} + \frac{2}{3}$
 $= 10 + \frac{3+2+10}{15} = 10 + \frac{15}{15}$
 $= 10 + 1 = 11$

4. (c) $? = -15 - 27 - 88 - 63 + 255$
 $= -193 + 255 = 62$

5. (b) Given expression can be written as
 $? = \frac{2525 \times 0.25 \times 7}{5} = 883.75$

6. (b) $? = \frac{14}{19} \times \frac{57}{70} \times \frac{20}{21} = \frac{2}{1} \times \frac{3}{10} \times \frac{20}{21} = \frac{2}{1} \times \frac{1}{1} \times \frac{2}{7} = \frac{4}{7}$

7. (e) $? = \frac{500 \times 32}{100} + \frac{50 \times 162}{100}$
 $= 160 + 81 = 241$

8. (d) $45316 + 52131 - 65229$
 $= ? + 15151$
 $\Rightarrow 32218 = ? + 15151$
 $\therefore ? = 32218 - 15151 = 17067$

9. (a) $? = \sqrt{25 - 12 + 155 + 1}$
 $= \sqrt{169} = 13$

10. (c) $? = \frac{184 \times 4}{400 \times 23} = \frac{184 \times 4}{4 \times 23} = 8$

11. (b) Amount paid
 $= ₹(40 \times 18 + 55 \times 8)$
 $= ₹(720 + 440)$
 $= ₹1160$

12. (c) Third number = $\frac{265}{5} = 53$

\therefore Smallest number = 49
Largest number = 57

\therefore Required value
 $= 57 + 2 \times 49$
 $= 57 + 98 = 155$

13. (e) Third number
 $= 5 \times 34.4 - 2 \times 46.5 - 2 \times 18$
 $= 172 - 93 - 36 = 43$

14. (c) Second angle of parallelogram
 $= 180^\circ - 45^\circ = 135^\circ$
 \therefore Required value
 $= 135 + 2 \times 45$
 $= 135 + 90 = 225^\circ$

15. (e) $M_1 D_1 = M_2 D_2$
 $\Rightarrow 9 \times 19 = 18 \times D_2$
 $\Rightarrow D_2 = \frac{9 \times 19}{18} = 9.5$ days

16. (b) Required remainder
 $= (46)^2 - (11)^3$
 $= 2116 - 1331 = 785$

17. (a) Let Gloria's and Sara's present ages be $4x$ and $7x$ years respectively.

Two years ago,

$$\frac{4x-2}{7x-2} = \frac{1}{2}$$

$$\Rightarrow 8x-4=7x-2$$

$$\Rightarrow x=2$$

\therefore Sara's age three years hence = $7x + 3$
= 17 years

18. (b) Total cost of plot
= ₹ 630×1800

$$\therefore \text{Booking amount} \\ = \frac{630 \times 1800 \times 45}{100}$$

$$= ₹ 510300$$

19. (d) Let $A = x$,

$$B = x + 2,$$

$$C = x + 4$$

\therefore According to the Question

$$4x = 3(x + 4)$$

$$\Rightarrow 4x - 3x = 12 \Rightarrow x = 12$$

$$\therefore B = x + 2 = 12 + 2 = 14$$

20. (d) (Larger number)²

$$= 11570 - 5329$$

$$= 6241$$

\therefore Larger number

$$= \sqrt{6241} = 79$$

21. (b) S.I. = $\frac{13033 \times 13 \times 3}{100}$

$$= ₹ 5082.87$$

$$C.I. = 13033 \left[\left(1 + \frac{13}{100} \right)^3 - 1 \right]$$

$$= 13033 \times 0.44$$

$$= ₹ 5772.28$$

$$\text{Difference} = 5772.28 - 5082.87$$

$$= ₹ 689.41$$

22. (e) Smallest number

$$= \frac{5685 - 3}{3} = 1894$$

23. (d) Number of items produced in 3 days = 1515

$$\text{Number of items produced in 1 day} = \frac{1515}{3}$$

Required number of items

$$= \frac{1515 \times 7}{3} = 3535$$

24. (e) S.I. = $\frac{12000 \times 9 \times 13}{100}$

$$= ₹ 14040$$

\therefore Amount = $12000 + 14040$

$$= ₹ 26040$$

25. (e) Given fractions can be written in decimal forms as

$$\frac{4}{9} = 0.44; \quad \frac{6}{13} = 0.46; \quad \frac{5}{11} = 0.45; \quad \frac{13}{16} = 0.8125$$

$$\frac{7}{12} = 0.583$$

\therefore Clearly,

$$\frac{13}{16} > \frac{7}{12} > \frac{6}{13} > \frac{5}{11} > \frac{4}{9}$$

26. (c) The pattern of the number series is :

$$800 \div 2 = 400$$

$$400 \div 2 = 200$$

$$200 \div 2 = 100$$

$$100 \div 2 = 50$$

$$50 \div 2 = \boxed{25}$$

27. (d) The pattern of the number series is :

$$2 + 1 \times 11 = 2 + 11 = 13$$

$$13 + 2 \times 11 = 13 + 22 = 35$$

$$35 + 3 \times 11 = 35 + 33 = 68$$

$$68 + 4 \times 11 = 68 + 44 = 112$$

$$112 + 5 \times 11 = 112 + 55 = \boxed{167}$$

28. (d) The pattern of the number series is :

$$650 - 7^2 = 650 - 49 = 601$$

$$601 - 6^2 = 601 - 36 = 565$$

$$565 - 5^2 = 565 - 25 = 540$$

$$540 - 4^2 = 540 - 16 = 524$$

$$524 - 3^2 = 524 - 9 = \boxed{515}$$

29. (e) The given number series is based on the following pattern:

$$\begin{array}{cccccccc} 9050 & 5675 & 3478 & 2147 & 1418 & \boxed{1077} & 950 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ - (15)^3 & - (13)^3 & - (11)^3 & - (9)^3 & - (7)^3 & - (5)^3 & \end{array}$$

Hence, the number 1077 is wrong and it should be replaced by 1075.

30. (b) The given number series is based on the following pattern :

$$\begin{array}{cccccccc} 8424 & 4212 & 2106 & \boxed{1053} & 526.5 & 263.25 & 131.625 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ \times \frac{1}{2} & \times \frac{1}{2} & \times \frac{1}{2} & \times \frac{1}{2} & \times \frac{1}{2} & \times \frac{1}{2} & \times \frac{1}{2} \end{array}$$

Hence, the number 1051 is wrong and it should be replaced by 1053.

31. (a) Value of one ticket of each kind = $55 + 85 + 105 = ₹ 245$

\therefore Required number of ticket of each kind

$$= \frac{2940}{245} = 12$$

32. (b) Ravina's monthly income

$$= 32000 \times \frac{100+15}{100} = 32000 \times \frac{115}{100} = ₹ 36800$$

$$= \text{Ramola's annual income} = 36800 \times 3 \times 12$$

$$= ₹ 1324800$$

33. (d) Marks scored by Ritu = $875 \times \frac{56}{100} = 490$

$$\text{Marks scored by Smita} = 875 \times \frac{92}{100} = 805$$

∴ Average marks scored by all the three together

$$= \frac{490 + 805 + 634}{3} = \frac{1929}{3} = 643$$

34. (e) According to the question

$$\text{Present age of Parineeta} = 33 - 9 = 24 \text{ years}$$

$$\text{Present age of Manisha} = 24 - 9 = 15 \text{ years}$$

$$\text{Present age of Deepali} = 24 + 15 = 39 \text{ years}$$

$$\therefore 5 : X = 15 : 39$$

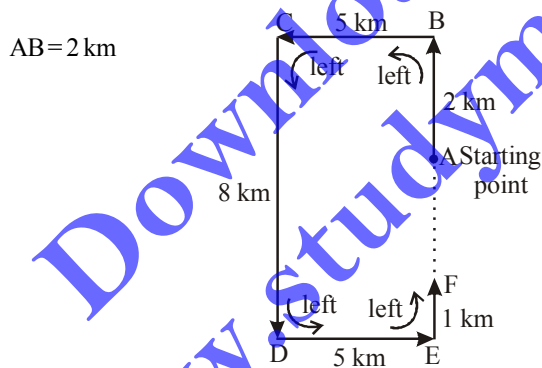
$$\therefore X = \frac{5 \times 39}{15} = 13$$

35. (c) Cost of one pencil box = $7 + 22 + 14 = ₹ 43$

$$\therefore \text{Required amount} = (20 \times 7) + (8 \times 22) + (6 \times 175) + (7 \times 43)$$

$$= 140 + 176 + 1050 + 301 = ₹ 1667$$

36. (e) According to questions.



$$BC = 5 \text{ km}$$

$$CD = 8 \text{ km}$$

$$DE = 5 \text{ km}$$

$$EF = 1 \text{ km}$$

$$BC = DE = 5 \text{ km}$$

$$CD = BE = 8 \text{ km}$$

$$BE = EF + AF + AB$$

$$\therefore AF = BE - (EF + AB)$$

$$= 8 - (1 + 2) = 8 - 3 = 5 \text{ km}$$

∴ Required distance = $AF = 5 \text{ km}$ and required direction is North

For questions 37-38 :

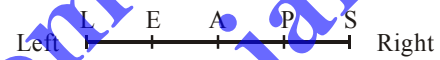
Person	Floor
B	6th
C	5th
F	4th
E	3rd
A	2nd
D	1st/Ground

37. (d) A and E live on the floors exactly between D and F.

38. (a) B lives on floor number 6.

For questions 39-40 :

The meaningful english word 'LEAPS' will be formed.

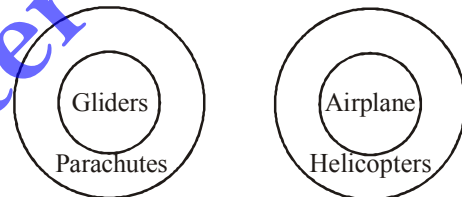


39. (d) P is placed second to the right of E.

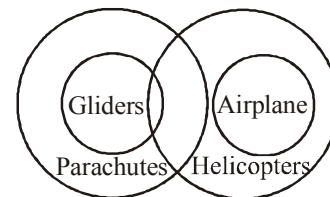
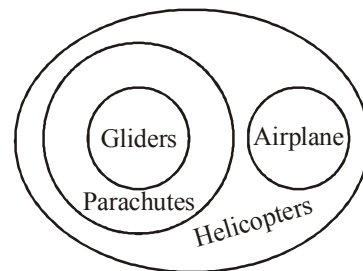
40. (c) The word 'LEAPS' will be formed based on the given conditions.

For questions 41-43 :

According to statements:



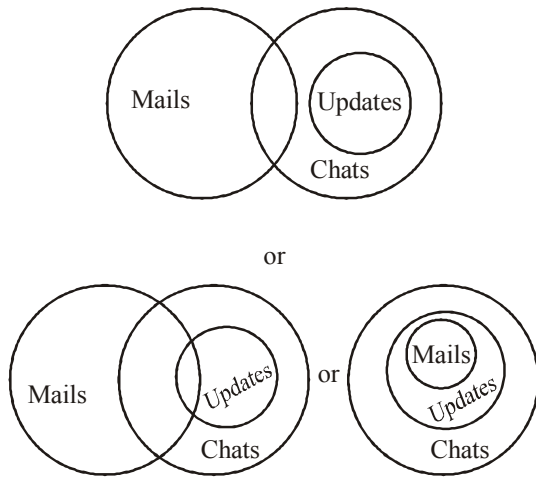
or



41. (a) Hence, only conclusion I follows.

42. (b) Hence, conclusion II follows.

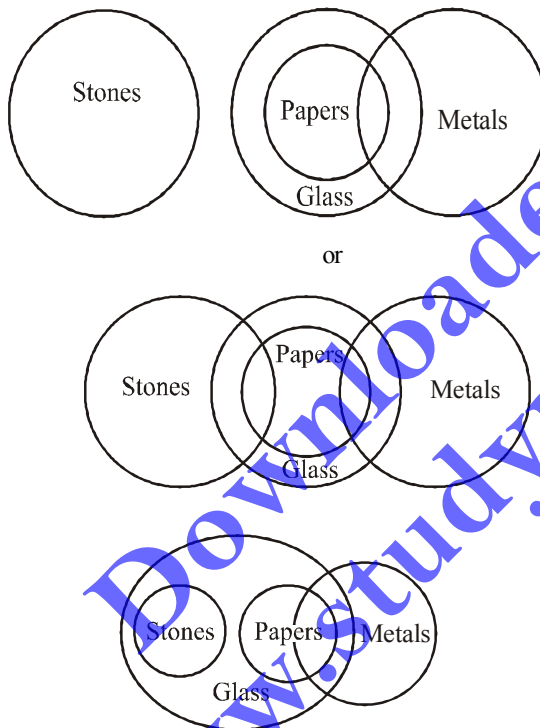
43. (d) According to statements.



Hence, conclusion I follows.

For questions 44 -45 :

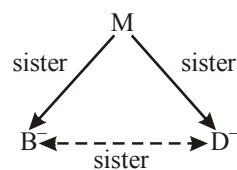
According to statements



- 44. (a) Hence, conclusion I follows.
- 45. (b) Hence, only conclusion II follows.
- 46. (c) **From statement I.**

B and D are sisters of M

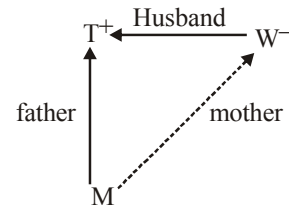
+ indicates Male



- indicates Female

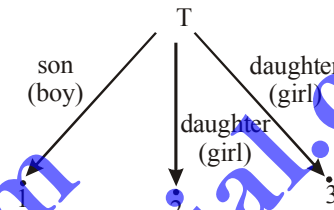
From statement II.

M's father T is husband of W



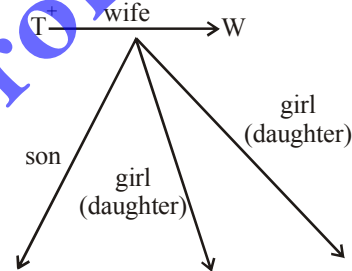
From statement III

Out of the three children which T has, only one is a boy.



From statements II and III

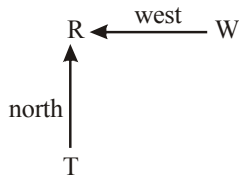
Since W is the wife of T, Hence W has 2 daughters



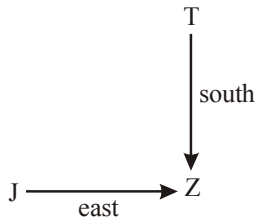
So, II and III, are required to answer the question.

- 47. (d) **From statement I,**
E > B > A.
From statement II
• > • > • > C > • > •
From statement III
• > • > • > • > D > F
From statements I, II and III
E > B > A > C > D > F
Hence E is the tallest.
So, all I, II and III are required to answer the question.
- 48. (a) **From statement I**
now or never again ⇒ tom ka na sa
From statement II
you come again now ⇒ ja ka ta sa
From statement III
again go now or never ⇒ na ho ka sa tom
From statement I and III
now or never again ⇒ tom ka na sa
again go now or never ⇒ na ho ka sa tom
Hence, go ⇒ ho
So, only I and III, are required to answer the question.

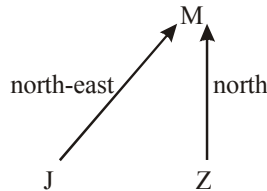
49. (e) From statement I



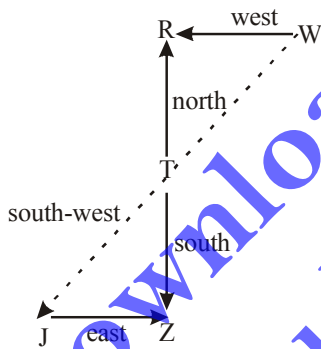
From statement II



From statement III



From statement I and II



Hence, village J is to the south-west of Village W. So, only I and II are required to answer the question.

50. (e) From statement I, II, III

Monday	Suresh's mother does not visit
Tuesday	
Wednesday	Leave
Thursday	Suresh's mother does not visit
Friday	
Saturday	

From statement II, Suresh visited Chennai the day after his mothers visit and the day of his mother's visit day is not given, so, we cannot answer the question even with all I, II and III.

Sol: 51-55

From the given data we can come up with the following sequence:

Row 1	P	T	q	v	s	r
Row 2	C	D	e	f	a	b

Sol: 55-60

The following table can be built to infer the answers:

Members	Car	Destination
TZ	Swift	Delhi
PQW	Honda city	Hyderabad
SVR	Ford Icon	Chennai

61. (b) $B > V \dots (i)$; $K < C \dots (ii)$; $C \leq B \dots (iii)$

No relationship can be find out between V and C. Hence I does not follow.

From (ii) and (iii), $B > K$. Hence II follows.

62. (d) $K > T \dots (i)$; $S = K \dots (ii)$; $T \leq R \dots (iii)$

Neither relationship can be established .

63. (c) $U = M \dots (i)$; $P \geq U \dots (ii)$; $M \geq B \dots (iii)$

Combining, we get $P \geq U = M \geq B \Rightarrow P \geq B$
 $\Rightarrow P = B$ or $P > B$

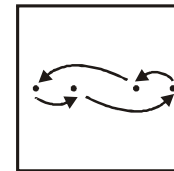
64. (d) $L \geq N \dots (i)$; $J \leq P \dots (ii)$; $P \geq L \dots (iii)$

Neither relationship can be established.

65. (e) $H \geq G \dots (i)$; $D > E \dots (ii)$; $H = E \dots (iii)$

Combining, we get $D > E = H \geq G$
 $\Rightarrow D > H$ and $G < D$

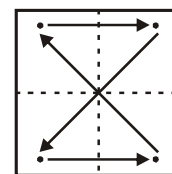
66. (b) From 2nd figure to 1st figure, the group of four symbols moves one step clockwise and the symbols change their position as follows :



The larger figure gets reduced in size and vice-versa.

67. (a) From 2nd to 1st figure, lower symbol moves one step upper side, gets enlarged and covers existing design. Inside lowermost symbol change its shape as upper most design.

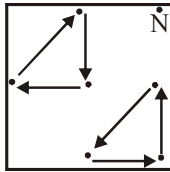
68. (c) The symbols of horizontal line become vertical and the symbols of vertical line become horizontal. Other four symbols move their position as follows:



69. (a) From 2nd figure to 1st figure, lower side symbol forms at left, left side design forms at upside after reversing

of its one end, upperside symbol forms right after reversing of its one end and the right side symbol forms at lowside after reversing of its one end.

70. (b) From 2nd figure to 1st figure, the symbol move as follows and new symbols form at the place of N.



71. (e) Piece of cake means something easy to do. Therefore, option (e) is the correct choice.
72. (b) Took to one's heels means to run away. Therefore, option (b) is the correct choice.
73. (e) To pledged means to make a promise. Therefore, option (e) is the correct choice.
74. (d) Crying need means a definite or desparate need for someone or something. Therefore, option (d) is the correct choice.
75. (d) Light upon means to arrive at something by chance. Therefore, option (d) is the correct choice.
91. (e) The meaning of the word **Root (Noun)** as used in the passage is : the main cause of something, such as a problem or difficult situation.

92. (b) The meaning of the word **Hardly (Adverb)** as used in the passage is : almost no; almost none. Hardly, barely and scarcely can all be used to say that something is only just true or possible.

Look at the sentence :

Hardly anyone bothered to reply.

93. (b) The meaning of the word **Radiant (Adjective)** as used in the passage is : showing great happiness, love or health; giving a bright light.

94. (a) The word **Reveal (Verb)** means : to make something known to somebody; disclose; display.

Look at the sentence :

Details of the murder were revealed by the local paper. The word **Hide (verb)** means : to put or keep something secret; conceal.

Hence, the antonym of revealed to should be hidden from.

95. (b) The word **Handsome (Adjective)** means good looking; attractive; beautiful to look at.

Look at the sentence :

The two of them made a handsome couple.

Its antonym should be **ugly**.

96. (d) Here, **for a picnic** should be used.
98. (a) Here, **The burst from** should be used. The words **blast** and **explosion** are synonymous.
99. (b) Here, **to reveal** should be used.
100. (a) The event shows past time. Hence, Simple Past i.e. My friend became should be used.

INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $1/4^{\text{th}}$ of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-15) : What should come in place of the question mark (?) in the following questions?

- 16% of 450 \div ? % of 250 = 4.8
 (a) 12 (b) 6
 (c) 4 (d) 10
 (e) None of these
- 19.5% of 524 = ?
 (a) 102.18 (b) 122.81
 (c) 120.18 (d) 112.81
 (e) None of these
- $\sqrt{?} - 11 = \sqrt{1521}$
 (a) $\sqrt{2500}$ (b) $(28)^2$
 (c) $\sqrt{28}$ (d) 50
 (e) None of these
- $700 \div 70 \div 0.5 = ?$
 (a) 10 (b) 2.5
 (c) 1.5 (d) 20
 (e) None of these
- $12.8 \times 4.5 \times 2.2 = ?$
 (a) 168.72 (b) 126.72
 (c) 128.27 (d) 162.72
 (e) None of these
- $55 \div 5.5 - 0.5 = ?$
 (a) 11 (b) 10
 (c) 8.5 (d) 10.5
 (e) None of these
- $(5 \times 5 \times 5 \times 5 \times 5 \times 5)^4 \times (5 \times 5)^6 \div (5)^2 = (25)^?$
 (a) 10 (b) 17
 (c) 19 (d) 12
 (e) None of these
- $8059 - 7263 = ? \times 40$
 (a) 19.9 (b) 18.7
 (c) 15.9 (d) 17.7
 (e) None of these
- $4 \times ? = 4062 \div 5$
 (a) 203.1 (b) 213.1
 (c) 205.1 (d) 215.1
 (e) None of these
- $3.5 \times (80 \div 2.5) = ?$
 (a) 122 (b) 111
 (c) 222 (d) 212
 (e) None of these
- $5\frac{1}{5} + 2\frac{3}{5} + 1\frac{2}{5} = ?$
 (a) $7\frac{4}{5}$ (b) $8\frac{3}{5}$
 (c) $6\frac{2}{5}$ (d) $9\frac{1}{5}$
 (e) None of these
- 13% of 258 - ? = 10
 (a) 23.45 (b) 24.53
 (c) 23.54 (d) 24.35
 (e) None of these

13. $\frac{4}{5} \times 2\frac{3}{4} \div \frac{5}{8} = ?$
- (a) $4\frac{12}{35}$ (b) $1\frac{12}{35}$
 (c) $2\frac{11}{35}$ (d) $3\frac{13}{25}$
 (e) None of these
14. $623.15 - 218.82 - 321.43 = ?$
- (a) 89.2 (b) 82.2
 (c) 89.9 (d) 79.2
 (e) None of these
15. $5437 - 3153 + 2284 = ? \times 50$
- (a) 96.66 (b) 91.36
 (c) 96.13 (d) 93.16
 (e) None of these
-
- DIRECTIONS (Qs. 16-20) : What should come in place of the question mark (?) in the following number series?**
16. 2 16 112 672 3360 13440 ?
- (a) 3430 (b) 3340
 (c) 40320 (d) 43240
 (e) None of these
17. 4 9 19 ? 79 159 319
- (a) 59 (b) 39
 (c) 49 (d) 29
 (e) None of these
18. 4000 2000 1000 500 250 125 ?
- (a) 80 (b) 65
 (c) 62.5 (d) 83.5
 (e) None of these
19. 588 563 540 519 ? 483 468
- (a) 500 (b) 496
 (c) 494 (d) 490
 (e) None of these
20. 121 ? 81 64 49 36 25
- (a) 92 (b) 114
 (c) 98 (d) 100
 (e) None of these
21. The sum of 15% of a positive number and 10% of the same number is 70. What is twice of that number?
- (a) 440 (b) 280
 (c) 560 (d) 140
 (e) None of these
22. Vikram scored 72 per cent marks in five subjects together, viz; Hindi, Science, Maths, English and Sanskrit together, where in the maximum marks of each subject were 100. How many marks did Vikram score in Science if he scored 80 marks in Hindi, 70 marks in Sanskrit, 76 marks in Maths and 65 marks in English?
- (a) 72 (b) 69
 (c) 59 (d) 71
 (e) None of these
23. The respective ratio between Pooja's, Prarthana's and Falguni's monthly income is 53:70: 57. If Prarthana's annual income is ₹4,20,000, what is the sum of Pooja's and Falguni's annual incomes? (In some cases monthly income and in some cases annual income is used.)
- (a) ₹ 5,92,500 (b) ₹ 6,83,500
 (c) ₹ 6,60,000 (d) ₹ 7,79,200
 (e) None of these
24. Manhar sold an item for ₹ 8,400 and incurred a loss of 25%. At what price should he have sold the item to have gained a profit of 40%?
- (a) ₹ 15,680
 (b) ₹ 16,220
 (c) ₹ 14,540
 (d) Cannot be determined
 (e) None of these
25. What will come in place of both the question marks (?) in the following question?
- $$\frac{(?)^{2.3}}{8} = \frac{2}{(?)^{1.7}}$$
- (a) 8 (b) 1
 (c) 4 (d) 16
 (e) 2
26. What would be the simple interest accrued in 4 years on a principal of ₹16,500 at the rate of 16 p.c.p.a.?
- (a) ₹ 11,560 (b) ₹ 10,250
 (c) ₹ 12,500 (d) ₹ 9,980
 (e) None of these
27. A truck covers a distance of 360 km in 8 hours. A car covers the same distance in 6 hours. What is the respective ratio between the speed of the truck and the car?
- (a) 3:5 (b) 3:4
 (c) 1:2 (d) 4:5
 (e) None of these
28. In order to pass in an exam a student is required to get 975 marks out of the aggregate marks. Priya got 870 marks and was declared failed by 7 per cent. What are the maximum aggregate marks a student can get in the examination?
- (a) 1500
 (b) 1000
 (c) 1200
 (d) Cannot be determined
 (e) None of these
29. The average of four consecutive numbers A, B, C and D respectively is 56.5. What is the product of A and C?
- (a) 3363 (b) 3306
 (c) 3192 (d) 3080
 (e) None of these
30. Parag walks 226 metres everyday. How many kilometres will he walk in five weeks?
- (a) 6.57 (b) 7.91
 (c) 8.23 (d) 9.41
 (e) None of these
31. On children's day sweets were to be equally distributed amongst 200 children. But on that particular day 40 children remained absent; hence each child got 2 sweets extra. How many sweets were distributed?
- (a) 3000 (b) 1500
 (c) 2000 (d) 1600
 (e) Cannot be determined

32. The perimeter of a square is one-fourth the perimeter of a rectangle. If the perimeter of the square is 44 cm and the length of the rectangle is 51 cm, what is the difference between the breadth of the rectangle and the side of the square?
 (a) 30 cm (b) 18 cm
 (c) 26 cm (d) 32 cm
 (e) None of these
33. What is the difference between the compound interest and simple interest accrued on an amount of ₹12,000 at the end of three years at the rate of 12%?
 (a) ₹539.136 (b) ₹602.242
 (c) ₹495.248 (d) ₹488.322
 (e) None of these
34. The area of a rectangle is equal to the area of a circle with circumference equal to 220 metres. What is the length of the rectangle if its breadth is 50 metres?
 (a) 56 metres (b) 83 metres
 (c) 77 metres (d) 69 metres
 (e) None of these
35. Prashant incurred a loss of 75 per cent on selling an article for ₹6,800. What was the cost price of the article?
 (a) ₹27,700 (b) ₹25,600
 (c) ₹21,250 (d) ₹29,000
 (e) None of these
- (a) 56 (b) 40
 (c) 52 (d) 44
 (e) None of these
41. Laxman went 15 km to the west from my house, then turned left and walked 20 km. He then turned East and walked 25 km and finally turning left covered 20 km. How far was he from my house ?
 (a) 5 km (b) 10 km
 (c) 40 km (d) 80 km
 (e) None of these
42. If 'yellow' means 'green', 'green' means 'white', white means 'red', 'red' means 'black', 'black' means 'blue' and 'blue' means 'violet', which of the following represents the colour of human blood ?
 (a) black (b) violet
 (c) red (d) blue
 (e) None of these
43. A trader in order to code the prices of article used the letters of PSICHOLAZY in the form of '0 to 9' respectively. Which of the following code stands for ₹875.50 ?
 (a) AIL.HP (b) AIL.HS
 (c) ZYA.HO (d) ZCA.OP
 (e) None of these

REASONING ABILITY

36. In a certain code, a number 13479 is written as AQFJL and 2568 is written as DMPN. How is 396824 written in that code?
 (a) QLPNMJ (b) QLPNMF
 (c) QLPMNF (d) QLPNDF
 (e) None of these
37. In the following sequence or instructions, 1 stands for Run, 2 stands for Stop, 3 stands for Go, 4 stands for Sit and 5 stands for Wait. If the sequence is continued, which instruction will come next?
 4 4 5 4 5 3 4 5 3 1 4 5 3 1 2 4 5 4 5 3 4 5 3
 (a) Wait (b) Sit
 (c) Stop (d) Run
 (e) None of these
38. If the first and second letters in the word DEPRESSION were interchanged, also the third and the fourth letters, the fifth and the sixth letters and so on, which of the following would be the seventh letter from the right ?
 (a) R (b) O
 (c) S (d) P
 (e) None of these
39. In a certain code 'na pa ka so' means 'birds fly very high', 'ri so la pa' means 'birds are very beautiful' and 'ti me ka bo' means 'the parrots could fly'. Which of the following is the code for 'high' in that language ?
 (a) na (b) ka
 (c) bo (d) so
 (e) None of these
40. If 'P' denotes '-'; 'Q' denotes '÷'; 'R' denotes '×' and 'W' denotes '+' then-
 48 Q 12 R 10 P 8 W 4 = ?
 (a) 56 (b) 40
 (c) 52 (d) 44
 (e) None of these
- DIRECTIONS (Qs. 44-48):** In each of the following questions there are three items. These three items may or may not be related with one another. Each group of items may fit into one of the diagrams (a), (b), (c), (d) and (e). You have to decide in which of the following diagrams and groups of items may fit. The number of that diagram is the answer.
- Give answer (a)** if only conclusion I follows.
Give answer (b) if only conclusion II follows.
Give answer (c) if either I or II follows.
Give answer (d) if neither I nor II follows.
Give answer (e) if both I and II follow.
44. **Statements:**
 All leaders are good team workers.
 All good team workers are good orators.
Conclusions:
I Some good team workers are leaders.
II All good orators are leaders.
45. **Statements:**
 All terrorists are human.
 All humans are bad.
Conclusions:
I All terrorists are bad.
II No human can be a terrorist.
46. **Statements:**
 Some teachers are followers.
 Some followers are famous.
Conclusions:
I Some teachers are famous.
II Some followers are teachers.
47. **Statements:**
 Some books are pens.
 No pen is pencil.
Conclusions:
I Some books are pencils.
II No book is pencil.

48. **Statements:**

Some dedicated souls are angles
All social workers are angles.

Conclusions:

- I** Some dedicated souls are social workers
II Some social workers are dedicated souls

DIRECTIONS (Qs. 49-50) : Study the information given below and answer the questions following it:

Mohan is son of Arun's father's sister. Prakash is son of Reva, who is mother of Vikash and grandmother of Arun. Pranab is father of Neela and grandfather of Mohan. Reva is wife of Pranab.

49. How is Mohan related to Reva ?

- (a) Grandson (b) Son
(c) Nephew (d) Data inadequate
(e) None of these

50. How is Vikash's wife related to Neela ?

- (a) Sister (b) Niece
(c) Sister-in-law (d) Data inadequate
(e) None of these

DIRECTIONS (Qs. 51-55) : Read the following information carefully to answer the questions that follow.

There are six teachers A, B, C, D, E and F in a school. Each of the teachers teaches two subjects, one compulsory subject and the other optional subject. D's optional subject is History while three others have it as compulsory subject. E and F have Physics as one of their subjects. F's compulsory subject is Mathematics which is an optional subject of both C and E. History and English are A's subjects but in terms of compulsory and optional subjects, they are reverse of those of D's. Chemistry is an optional subject of any one of them. There is only one female teacher in the school who has English as her compulsory subject.

51. What is C's compulsory subject ?

- (a) History (b) Physics
(c) Chemistry (d) English
(e) None of these

52. Who is a female member in the group ?

- (a) A (b) B
(c) C (d) D
(e) None of these

53. Who among the following has same optional subjects as that of the compulsory subject of F ?

- (a) D (b) B
(c) A (d) C
(e) None of these

54. Disregarding which is compulsory and which is the optional subject, who has the same two subjects combination as F ?

- (a) A (b) B
(c) E (d) D
(e) None of these

55. Which of the following groups of teachers has History as the compulsory subject ?

- (a) A, C and D (b) B, C and D
(c) C and D (d) A, B and C
(e) None of these

DIRECTIONS (Qs. 56-60) : In each of the questions below a group of letters are given followed by four groups of digits/symbol combinations numbered (a), (b), (c) and (d). Letters are to be coded as per the codes and conditions given below. You have to find out which of the combinations (a), (b), (c) and (d) is correct and indicate your answer accordingly. If none of the four represents the correct code, mark (e) i.e. 'None of these' as your answer.

Letter	B	H	S	N	T	O	A	K	R	I	E	U	G
Digit/ Symbol Code	6	8	1	#	5	2	\$	3	9	@	4	7	%

Conditions :

- (i) If the first as well as last letter is vowel, both are to be coded as 'O'.
(ii) If the first letter is a vowel and the last letter is consonant, both are to be coded as 'Z'.
(iii) If the first letter is a consonant and the last letter is vowel, both are to be coded as '*'.
56. **ONSIRT**

- (a) 2#1@95 (b) Z#@195
(c) Z#1@9Z (d) Z#1@95
(e) None of these

57. **KIUBSR**

- (a) O@76129 (b) O@7610
(c) 3@7691 (d) 3@6719
(e) None of these

58. **BKAEUG**

- (a) 03\$470 (b) 63\$470
(c) 03\$47% (d) 63\$47%
(e) None of these

59. **STOKGA**

- (a) 1523%\$ (b) 1523%*
(c) *523%* (d) *523%\$
(e) None of these

60. **ORHSNU**

- (a) O98#17 (b) O981#O
(c) 298#10 (d) 2981#7
(e) None of these

DIRECTIONS (Qs. 61-65) : In the following questions, the symbols @, #, \$, % and © are used with the following meaning as illustrated below :

'P \$ Q' means 'P is not greater than Q'

'P @ Q' means 'P is neither smaller than nor equal to Q'.

'P % Q' means 'P is neither greater than nor equal to Q'.

'P © Q' means 'P is not smaller than Q'.

'P # Q' means 'P is neither greater than nor smaller than Q'.

Now in each of the following questions assuming the given statements to be true, find which of the three conclusions I, II and III given below them is/are definitely true.

61. **Statements :** M @ R, R © K, J % K

- Conclusions :** I. M @ J
II. J % R
III. K % M

- (a) Only I follows (b) Only I and II follow
(c) Only II and III follow (d) All follow
(e) None of these

62. **Statements :** D © N, N # V, W \$ V

Conclusions : I. D # W
II. W % D
III. V # D

- (a) Only III follows
(b) Only either I or II follows
(c) Only either II or III follows
(d) Only either I or III follows
(e) None of these

63. **Statements :** H % B, M © B, K # M

Conclusions : I. K @ H
II. B # K
III. K @ B

- (a) All follow
(b) Only I follows
(c) Only either II or III follows
(d) Only either II or III and I follow
(e) None of these

64. **Statement :** V © M, N \$ V, J @ N

Conclusions : I. J @ M
II. M @ N
III. V @ J

- (a) Only II follows
(b) Only I follows
(c) Only either I or II follows
(d) Only III follows
(e) None of these

65. **Statements :** A @ B, B © E, F % E

Conclusions : I. A @ F
II. F % B
III. E % A

- (a) Only I follows
(b) Only I and II follow
(c) Only I and III follow
(d) I, II and III follow
(e) None of these

DIRECTIONS (Qs. 66-70) : Study the following information carefully and answer the given questions.

If A + B means A is the father of B

If A × B means A is the sister of B

If A \$ B means A is the wife of B

If A % B means A is the mother of B

If A ÷ B means A is the son of B

66. What should come in place of the question mark, to establish that J is the brother of T in the expression?

J ÷ P % H ? T % L

- (a) × (b) ÷
(c) \$ (d) Either ÷ or ×
(e) Either + or ÷

67. Which among the given expressions indicate that M is the daughter of D?

- (a) L % R \$ D + T × M (b) L + R \$ D + M × T

(c) L % R % D + T ÷ M (d) D + L \$ R + M × T

(e) L \$ D ÷ R % M ÷ T

68. Which among the following options is true if the expression 'I + T % J × L ÷ K' is **definitely true**?

- (a) L is the daughter of T
(b) K is the son-in-law of I
(c) I is the grandmother of L
(d) T is the father of L
(e) J is the brother of L

69. Which among the following expression is true if Y is the son of X is **definitely false**?

- (a) W % L × T × Y ÷ X (b) W + L × T × Y ÷ X
(c) X + L × T × Y ÷ W (d) W \$ X + L + Y + T
(e) W % X + T × Y ÷ L

70. What should come in place of the question mark, to establish that T is the sister-in-law of Q in the expression?

R % T × P ? Q + V

- (a) ÷ (b) %
(c) × (d) \$
(e) Either \$ or ×

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-75) : In each question below a sentence with four words printed in bold type is given. These are numbered as (a), (b), (c) and (d). One of these four words printed in bold may be either wrongly spelt or inappropriate in the context of the sentence. Find out the word, which is wrongly spelt or inappropriate, if any. The number of that word is your answer. If all the words printed in bold are correctly spelt and also appropriate in the context of the sentence, mark (e) i.e. 'All Correct' as your answer.

71. **Bye** (a) / the summer of 1939, Hitler was **ready** (b) / to **unleash** (c) / his army on **Europe**. (d) / All correct (e).

72. The two **national** (a) / **emblems** (b) / **of** India are of (c) / Buddhist **origin**. (d) / All correct (e)

73. **Political** (a) / **desicions** (b) / **ought** (c) / to have a **rationale**. (d) / All correct (e)

74. **Traditionalli**, (a) / sales get a **boost** (b) / in the **festival** (c) / **season**. (d) / All correct (e)

75. **Fifteen** (a) percent of India's land is **still** (b) / **covered** (c) / by **forrests**. (d) / All correct (e)

DIRECTIONS (Qs. 76-80) : Which of the phrases (a), (b), (c) and (d) given below should replace the phrase given in bold in the following sentence to make the sentence grammatically and correct. If the sentence is correct as it is and 'No correction is required', mark (e) as the answer.

76. **One of the factor** for her failure is the lack of concern for others.

- (a) The mainly factor (b) One off factor
(c) One of the factors (d) Among of the factor
(e) No correction required

77. In reality, this policy will only lead to more corruption in an **already corrupt** environment

- (a) a already corrupt (b) already an corrupt
(c) among already corrupt (d) overly corrupt already
(e) No correction required

78. **At currently estimates**, the cost of modernizing the airport would be more than double the earlier estimate.
 (a) By currently estimates (b) On current estimates
 (c) With estimates currently (d) At current estimates
 (e) No correction required
79. **No of these** moves brought credit to the management.
 (a) Any of these (b) Some off these
 (c) None of these (d) These of all
 (e) No correction required
80. India has **always been** primarily an agricultural country.
 (a) always be (b) been towards
 (c) become always (d) always become
 (e) No correction required

DIRECTIONS (Qs. 81-90) : Read the following passage to answer the given questions based on it.

Organized retail has fuelled new growth categories-like liquid hand wash, breakfast cereals and pet foods in the consumer goods industry, accounting for almost 50% of their sales, said data from market search firm Nielsen. The figures showed some of these new categories got more than 40% of their business from modern retail outlets. The data also suggests how products in these categories reach the neighbourhood Kirana stores after they have established themselves in modern trade.

While grocers continue to be an important channel, for the new and evolving categories we saw an increased presence of high-end products in modern trade. For example, premium products in laundry detergents, dishwashing, car air fresheners and surface care increased in availability through this format as these products are aimed at affluent consumers who are more likely to shop in supermarket/ hypermarket outlets and who are willing to pay more for specialized products.

Some other categories that have grown exceptionally and now account for bulk of the sales from modern retail are frozen and ready-to-eat foods, pet food, diapers, pre-and post-wash products, hair conditioners, and high-end shaving products besides others. "With the evolution of modern trade, our growth in this channel has been healthy as it is for several other categories. Modern retail is an important part of our business" said managing director, Kellogg India.

What modern retail offers to companies experimenting with new categories is the chance to educate customers which was not the case with a general trade store. "Category creation and market development starts with modern trade but as more consumers start consuming this category, they penetrate into other channels," said president, food & FMCG category, Future Group - the country's largest retailer which operates stores like Big Bazaar.

But a point to note here is that modern retailers themselves push their own private brands in these very categories and can emerge as a big threat for the consumers goods and foods companies.

For instance, Big Bazaar's private label Clean Mate is hugely popular and sells more than a brand like Harpic in its own stores. "So there is a certain amount of conflict and competition that will play out over the next few years which the FMCG companies will have to watch out for," said, KPMG's executive director (retail).

In the past there have been instances of retailers boycotting products from big FMCG players on the issue of margins; but as modern retail becomes increasingly significant for pushing new

categories, experts say we could see more partnerships being forged between retailers and FMCG companies. "Market development for new categories takes time so brand wars for leadership and consumer franchise will be fought on the modern retail platform. A new brand can overnight compete with established companies by tying up with few retailers in these categories," President of Future Group added.

81. Which of the following is being referred to as new growth category?
 (a) Soap cake (b) Fresh fruits
 (c) Fresh vegetables (d) Liquid Hand-wash
 (e) Usual groceries
82. Which of the following is being referred to as modern retail outlet?
 (a) Kirana Store (b) On-line Store
 (c) Door-to-door Selling
 (d) Road-side Hawkers
 (e) Supermarket
83. Which of the following best conveys the meaning of the phrase, "**watch out for**" as used in the passage?
 (a) demand justice (b) avoid conflict
 (c) be on the alert (d) passively accept
 (e) open for competition
84. Which of the following is being referred to as 'certain amount of conflict'?
 (a) Retailers selling their own products with products of companies.
 (b) Retailers selling similar products of different consumer companies
 (c) Offering differential rate of margin for different products
 (d) New products killing the old products
 (e) Different retailers selling same category of products
85. The new growth category products-
 (a) reach first the neighbourhood Kirana shop and then the modern retail outlets
 (b) account for less than 20% of sales in organized retail
 (c) reach all the outlets almost at the same time
 (d) first become popular in modern trade outlets before reaching Kirana shops
 (e) are aimed at the poor section of the society
86. Which of the following **is not** true in the context of the passage?
 (a) Clean Mate is a product of an organized retailers
 (b) Some retailers don't keep some products if the profit margin is not good
 (c) A new brand can never quickly displace an established brand
 (d) Kirana store still remains an important channel
 (e) In future there will be more partnerships between retailers and FMCG Companies
87. Which of the following categories has become very popular through sales from modern retail outlets?
 (a) Frozen foods (b) Computers
 (c) Cell phones (d) Fresh fruits
 (e) Soft drinks
88. Which class/section of people are more likely to shop in Hypermarket outlets?
 (a) Senior citizens (b) Younger generation
 (c) Rich consumers (d) Poor section
 (e) Women

89. Which of the following advantages do modern retail outlets provide for new categories of products as compared to general trade stores?
 (a) Higher profit margins
 (b) Experimenting with new products
 (c) Competition with similar products
 (d) Better packing of the product
 (e) Products at much lower price
90. "..... penetrate into other Channels." Which of the following is being referred to as Channels?
 (a) Products (b) Companies
 (c) New products (d) Existing products
 (e) None of these
- DIRECTIONS (Qs. 91-100) :** In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate word in each case.
- Today the economies of African countries are growing at 5 per cent every year.
 Rich countries usually help poorer ones (91) African countries through donations and aid. Their (92) are not always successful as loans are (93) not used for the projects for which they are (94). China, however, has found a different (95) to help Africa - by trading more with the (96). In 2009 China's trade with African countries was \$ 90 billion - (97) than the U.S., which was \$ 86 billion. (98) countries have now begun to notice the (99) available in Africa. China's attitude has (100) the way the world deals with poor countries. "Trade not aid" is the new mantra of African nations.
91. (a) belonging (b) similarly
 (c) compared (d) with
 (e) like
92. (a) efforts (b) practices
 (c) challenges (d) achievements
 (e) attempt
93. (a) given (b) approved
 (c) regular (d) often
 (e) being
94. (a) grant (b) sanctioned
 (c) took (d) hired
 (e) apply
95. (a) goal (b) fund
 (c) way (d) skill
 (e) dream
96. (a) countries (b) others
 (c) abroad (d) neighbours
 (e) poor
97. (a) further (b) extra
 (c) more (d) less
 (e) high
98. (a) Recently (b) Any
 (c) Friendly (d) Many
 (e) While
99. (a) differences (b) supply
 (c) quantity (d) people
 (e) opportunities
100. (a) substitute (b) changed
 (c) exchanged (d) transform
 (e) convert

RESPONSE SHEET

- | | | | | | | | | | |
|-----|---------------------|-----|---------------------|-----|---------------------|-----|---------------------|------|---------------------|
| 1. | (a) (b) (c) (d) (e) | 2. | (a) (b) (c) (d) (e) | 3. | (a) (b) (c) (d) (e) | 4. | (a) (b) (c) (d) (e) | 5. | (a) (b) (c) (d) (e) |
| 6. | (a) (b) (c) (d) (e) | 7. | (a) (b) (c) (d) (e) | 8. | (a) (b) (c) (d) (e) | 9. | (a) (b) (c) (d) (e) | 10. | (a) (b) (c) (d) (e) |
| 11. | (a) (b) (c) (d) (e) | 12. | (a) (b) (c) (d) (e) | 13. | (a) (b) (c) (d) (e) | 14. | (a) (b) (c) (d) (e) | 15. | (a) (b) (c) (d) (e) |
| 16. | (a) (b) (c) (d) (e) | 17. | (a) (b) (c) (d) (e) | 18. | (a) (b) (c) (d) (e) | 19. | (a) (b) (c) (d) (e) | 20. | (a) (b) (c) (d) (e) |
| 21. | (a) (b) (c) (d) (e) | 22. | (a) (b) (c) (d) (e) | 23. | (a) (b) (c) (d) (e) | 24. | (a) (b) (c) (d) (e) | 25. | (a) (b) (c) (d) (e) |
| 26. | (a) (b) (c) (d) (e) | 27. | (a) (b) (c) (d) (e) | 28. | (a) (b) (c) (d) (e) | 29. | (a) (b) (c) (d) (e) | 30. | (a) (b) (c) (d) (e) |
| 31. | (a) (b) (c) (d) (e) | 32. | (a) (b) (c) (d) (e) | 33. | (a) (b) (c) (d) (e) | 34. | (a) (b) (c) (d) (e) | 35. | (a) (b) (c) (d) (e) |
| 36. | (a) (b) (c) (d) (e) | 37. | (a) (b) (c) (d) (e) | 38. | (a) (b) (c) (d) (e) | 39. | (a) (b) (c) (d) (e) | 40. | (a) (b) (c) (d) (e) |
| 41. | (a) (b) (c) (d) (e) | 42. | (a) (b) (c) (d) (e) | 43. | (a) (b) (c) (d) (e) | 44. | (a) (b) (c) (d) (e) | 45. | (a) (b) (c) (d) (e) |
| 46. | (a) (b) (c) (d) (e) | 47. | (a) (b) (c) (d) (e) | 48. | (a) (b) (c) (d) (e) | 49. | (a) (b) (c) (d) (e) | 50. | (a) (b) (c) (d) (e) |
| 51. | (a) (b) (c) (d) (e) | 52. | (a) (b) (c) (d) (e) | 53. | (a) (b) (c) (d) (e) | 54. | (a) (b) (c) (d) (e) | 55. | (a) (b) (c) (d) (e) |
| 56. | (a) (b) (c) (d) (e) | 57. | (a) (b) (c) (d) (e) | 58. | (a) (b) (c) (d) (e) | 59. | (a) (b) (c) (d) (e) | 60. | (a) (b) (c) (d) (e) |
| 61. | (a) (b) (c) (d) (e) | 62. | (a) (b) (c) (d) (e) | 63. | (a) (b) (c) (d) (e) | 64. | (a) (b) (c) (d) (e) | 65. | (a) (b) (c) (d) (e) |
| 66. | (a) (b) (c) (d) (e) | 67. | (a) (b) (c) (d) (e) | 68. | (a) (b) (c) (d) (e) | 69. | (a) (b) (c) (d) (e) | 70. | (a) (b) (c) (d) (e) |
| 71. | (a) (b) (c) (d) (e) | 72. | (a) (b) (c) (d) (e) | 73. | (a) (b) (c) (d) (e) | 74. | (a) (b) (c) (d) (e) | 75. | (a) (b) (c) (d) (e) |
| 76. | (a) (b) (c) (d) (e) | 77. | (a) (b) (c) (d) (e) | 78. | (a) (b) (c) (d) (e) | 79. | (a) (b) (c) (d) (e) | 80. | (a) (b) (c) (d) (e) |
| 81. | (a) (b) (c) (d) (e) | 82. | (a) (b) (c) (d) (e) | 83. | (a) (b) (c) (d) (e) | 84. | (a) (b) (c) (d) (e) | 85. | (a) (b) (c) (d) (e) |
| 86. | (a) (b) (c) (d) (e) | 87. | (a) (b) (c) (d) (e) | 88. | (a) (b) (c) (d) (e) | 89. | (a) (b) (c) (d) (e) | 90. | (a) (b) (c) (d) (e) |
| 91. | (a) (b) (c) (d) (e) | 92. | (a) (b) (c) (d) (e) | 93. | (a) (b) (c) (d) (e) | 94. | (a) (b) (c) (d) (e) | 95. | (a) (b) (c) (d) (e) |
| 96. | (a) (b) (c) (d) (e) | 97. | (a) (b) (c) (d) (e) | 98. | (a) (b) (c) (d) (e) | 99. | (a) (b) (c) (d) (e) | 100. | (a) (b) (c) (d) (e) |

Answer Key

1	(b)	11	(d)	21	(c)	31	(d)	41	(b)	51	(a)	61	(d)	71	(a)	81	(d)	91	(e)
2	(a)	12	(c)	22	(b)	32	(c)	42	(e)	52	(d)	62	(b)	72	(e)	82	(e)	92	(a)
3	(e)	13	(d)	23	(c)	33	(a)	43	(e)	53	(d)	63	(d)	73	(b)	83	(c)	93	(d)
4	(d)	14	(e)	24	(a)	34	(c)	44	(a)	54	(c)	64	(e)	74	(a)	84	(a)	94	(b)
5	(b)	15	(b)	25	(e)	35	(e)	45	(a)	55	(d)	65	(d)	75	(d)	85	(d)	95	(c)
6	(e)	16	(c)	26	(e)	36	(d)	46	(b)	56	(c)	66	(a)	76	(c)	86	(c)	96	(a)
7	(b)	17	(b)	27	(b)	37	(d)	47	(c)	57	(e)	67	(b)	77	(e)	87	(a)	97	(c)
8	(a)	18	(c)	28	(a)	38	(d)	48	(d)	58	(d)	68	(b)	78	(d)	88	(c)	98	(d)
9	(a)	19	(a)	29	(e)	39	(a)	49	(a)	59	(c)	69	(d)	79	(c)	89	(b)	99	(e)
10	(e)	20	(d)	30	(b)	40	(e)	50	(c)	60	(b)	70	(d)	80	(e)	90	(a)	100	(b)

Answers & Explanations

1. (b) $16\% \text{ of } 450 \div ?\% \text{ of } 250 = 4.8$

$$\Rightarrow 450 \times \frac{16}{100} \div 250 \times \frac{?}{100} = 4.8$$

$$\Rightarrow 72 \div 2.5 \times ? = 4.8$$

$$\Rightarrow 2.5 \times ? = \frac{72}{4.8}$$

$$\therefore ? = \frac{72}{4.8 \times 2.5} = 6$$

2. (a) $? = 19.5\% \text{ of } 524 = 524 \times \frac{19.5}{100} = 102.18$

3. (e) $\sqrt{?} - 11 = \sqrt{1521}$

$$\Rightarrow \sqrt{?} - 11 = 39$$

$$\Rightarrow \sqrt{?} = 39 + 11 = 50$$

$$\therefore ? = (50)^2 = 2500$$

4. (d) $? = 700 \div 70 \div 0.5 = 700 \times \frac{1}{70} \times \frac{1}{0.5} = 20$

5. (b) $? = 12.8 \times 4.5 \times 2.2 = 126.72$

6. (e) $? = 55 \div 5.5 - 0.5 = 55 \times \frac{1}{5.5} - 0.5$
 $= 10 - 0.5 = 9.5$

7. (b) $(25)^? = (5 \times 5 \times 5 \times 5 \times 5 \times 5)^4 \times (5 \times 5)^6 \div (5)^2$

$$= (25 \times 25 \times 25)^4 \times (25)^6 \div (25)^1$$

$$= (25^3)^4 \times (25)^6 \div 25^1 = (25)^{12} \times (25)^6 \div (25)^1$$

$$= (25)^{12+6-1} = (25)^{17}$$

$$\therefore ? = 17$$

8. (a) $? \times 40 = 8059 - 7263 = 796$

$$\therefore ? = \frac{796}{40} = 19.9$$

9. (a) $4 \times ? = 4062 \div 5 = 4062 \times \frac{1}{5} = 812.4$

$$\therefore ? = \frac{812.4}{4} = 203.1$$

10. (e) $? = 3.5 \times (80 \div 2.5) = 3.5 \times \left(80 \times \frac{1}{2.5}\right)$

$$= 3.5 \times 32 = 112$$

11. (d) $? = 5\frac{1}{5} + 2\frac{3}{5} + 1\frac{2}{5} = \frac{26}{5} + \frac{13}{5} + \frac{7}{5}$

$$= \frac{26+13+7}{5} = \frac{46}{5} = 9\frac{1}{5}$$

12. (c) $13\% \text{ of } 258 - ? = 10$

$$\therefore ? = 13\% \text{ of } 258 - 10$$

$$= 258 \times \frac{13}{100} - 10 = 33.54 - 10 = 23.54$$

13. (d) $? = \frac{4}{5} \times 2\frac{3}{4} \div \frac{5}{8} = \frac{4}{5} \times \frac{11}{4} \div \frac{5}{8}$

$$= \frac{4}{5} \times \frac{11}{4} \times \frac{8}{5} = \frac{88}{25} = 3\frac{13}{25}$$

14. (e) $? = 623.15 - 218.82 - 321.43 = 623.15 - 540.25 = 82.9$

15. (b) $? \times 50 = 5437 - 3153 + 2284 = 7721 - 3153 = 4568$

$$\therefore ? = \frac{4568}{50} = 91.36$$

16. (c) Given series.

$$\begin{array}{cccccccc} 2 & 16 & 112 & 672 & 3360 & 13440 & \boxed{40320} \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ \times 8 & \times 7 & \times 6 & \times 5 & \times 4 & \times 3 & \end{array}$$

$$\therefore ? = 40320$$

17. (b) Given series.

$$\begin{array}{ccccccccc} 4 & 9 & 19 & \boxed{39} & 79 & 159 & 319 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ \times 2+1 & \times 2+1 & \times 2+1 & \times 2+1 & \times 2+1 & \times 2+1 & \times 2+1 \end{array}$$

$$\therefore ? = 39$$

18. (c) Given series

$$\begin{array}{ccccccccc} 4000 & 2000 & 1000 & 500 & 250 & 125 & \boxed{62.5} \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ \div 2 & \div 2 & \div 2 & \div 2 & \div 2 & \div 2 & \div 2 \end{array}$$

$$\therefore ? = 62.5$$

19. (a) Given series.

$$\begin{array}{ccccccccc} 588 & 563 & 540 & 519 & \boxed{500} & 483 & 468 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ -25 & -23 & -21 & -19 & -17 & -15 & \end{array}$$

$$\therefore ? = 500$$

20. (d) Given series.

$$\begin{array}{ccccccccc} 121 & \boxed{100} & 81 & 64 & 49 & 36 & 25 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ (11)^2 & (10)^2 & (9)^2 & (8)^2 & (7)^2 & (6)^2 & (5)^2 \end{array}$$

$$\therefore ? = 100$$

21. (c) Let the positive no. be
- x
- .

According to question. 15% of x + 10% of x = 70

$$\Rightarrow x \times \frac{15}{100} + \frac{x \times 10}{100} = 70$$

$$\Rightarrow \frac{15x}{100} + \frac{10x}{100} = 70$$

$$\Rightarrow \frac{25x}{100} = 70$$

$$\therefore x = \frac{70 \times 100}{25} = 280$$

$$\therefore \text{Double of given no.} = 280 \times 2 = 560$$

22. (b) Total number obtained by Vikram

$$= (100 \times 5) \times \frac{72}{100} = 500 \times \frac{72}{100} = 360$$

\therefore Number in science

$$= 360 - (80 + 70 + 76 + 65) = 360 - 291 = 69$$

23. (c) Monthly income of Prarthana's =
- $\frac{4,20,000}{12} = ₹ 35,000$

Monthly income of Pooja and Falgunis

$$= 35,000 \times \frac{53+57}{70} = 35,000 \times \frac{110}{70} = ₹ 55,000$$

\therefore Annual income of Pooja and Falgunis

$$= 55,000 \times 12 = ₹ 6,60,000$$

24. (a) Cost price of item.

$$= 8400 \times \frac{100}{100-25} = 8400 \times \frac{100}{75} = ₹ 11200$$

SP of item

$$= 11200 \times \frac{100+40}{100} = 11200 \times \frac{140}{100} = ₹ 15680$$

$$25. (e) \frac{(?)^{2.3}}{8} = \frac{2}{(?)^{1.7}}$$

$$\Rightarrow (?)^{2.3+1.7} = 16 \Rightarrow (?)^4 = 16 = (2)^4$$

$$\therefore ? = 2$$

26. (e) Simple interest

$$= \frac{\text{principle} \times \text{time} \times \text{rate}}{100} = \frac{16500 \times 4 \times 16}{100} = ₹ 10560$$

27. (b) Speed of truck

$$= \frac{\text{distance}}{\text{time}} = \frac{360}{8} = 45 \text{ km/hr}$$

Speed of car

$$= \frac{\text{distance}}{\text{time}} = \frac{360}{6} = 60 \text{ km/hr}$$

$$\therefore \text{Ratio} = 45 : 60 = 3 : 4$$

28. (a) Minimum marks to pass = 975

Priya failed by $975 - 870 = 105$ marks

$$\therefore \text{Maximum mark} = \frac{105}{7} \times 100 = 1500$$

29. (e) Let four consecutive numbers are

$$A = (x), B = (x+1), C = (x+2) \text{ and } D = (x+3)$$

According to question

$$\text{Average} = \frac{(x) + (x+1) + (x+2) + (x+3)}{4}$$

$$\Rightarrow 56.5 = \frac{4x+6}{4}$$

$$\Rightarrow 226 = 4x+6$$

$$\Rightarrow 4x = 226 - 6 = 220 \quad \therefore x = \frac{220}{4} = 55$$

\therefore Product of A and C

$$= (x) \times (x+2) = (55) \times (55+2) = 55 \times 57 = 3135$$

30. (b) Required distance

$$= 226 \times (5 \times 7) = 226 \times 35 = 7910 \text{ m} = 7.91 \text{ km}$$

31. (d) Let
- x
- sweets is distributed to each children

According to question $(200 - 40) \times (x + 2) = 200 \times x$

$$\Rightarrow (160) \times (x + 2) = 200x \Rightarrow 160x + 320 = 200x$$

$$\Rightarrow 200x - 160x = 320 \Rightarrow 40x = 320$$

$$\therefore x = \frac{320}{40} = 8$$

$$\therefore \text{Total no. of sweets} = 200 \times x = 200 \times 8 = 1600$$

For (Qs. 51 to 55)

The given information is summarised in a table as follows :

Teachers	Subjects	
	Compulsory	Optional
A	History	English
B	History	Chemistry
C	History	Mathematics
D	(Female) English	History
E	Physics	Mathematics
F	Mathematics	Physics

51. (a) History is the compulsory subject of C.
 52. (d) D is a female member in the group.
 53. (d) The compulsory subject of F (Mathematics) is the optional subject of C.
 54. (c) E has physics and Mathematics as his two subjects.
 55. (d) A, B and C all have History as the compulsory subjects.

Letter	O	N	S	I	R	T
Code	Z	#	1	@	9	Z

56. (c)

Condition (ii) is applied.

Letter	K	I	U	B	S	R
Code	3	@	7	6	1	9

57. (e)

Letter	B	K	A	E	U	G
Code	6	3	\$	4	7	%

58. (d)

Letter	S	T	O	K	G	A
Code	*	5	2	3	%	*

59. (c)

Condition (iii) is applied.

Letter	O	R	H	S	N	U
Code	O	9	8	1	#	O

60. (b)

Condition (i) is applied.

61. (d) $M > R$... (i)
 $R \geq K$... (ii)
 $J < K$... (iii)

Combining (i), (ii) and (iii), we get

$$M > R \geq K > J \Rightarrow M > J \text{ (conclusion I)}$$

$$R > J \text{ (conclusion II)}$$

$$M > K \text{ (conclusion III)}$$

Hence, conclusion I ($M > J$), conclusion II ($J < R$) and conclusion III ($K < M$) are true.

62. (b) $D \geq N$... (i)
 $N = V$... (ii)
 $W \leq V$... (iii)

Combining (i) and (ii), we get

 $D \geq N = V \Rightarrow D \geq V$. Hence, conclusion III ($V = D$) is not necessary true.

Again, combining all (i), (ii) and (iii), we get

 $D \geq N = V \geq W \Rightarrow D \geq W$. Hence, neither conclusion I ($D = W$) nor conclusion II ($W < D$) is true. But both conclusion I ($D = W$) and conclusion II ($W < D$) together make a complementary pair. Hence, either conclusion I or conclusion II is true.

63. (d)
- $H < B$
- ... (i)

$M \geq B$... (ii)

$K = M$... (iii)

Combining (ii) and (iii), we get

 $K = M \geq B \Rightarrow K \geq B$. Hence, neither conclusion II ($B = K$) nor conclusion III ($K > B$) is true. But, both conclusion I and conclusion II together make a complementary pair. Hence, either conclusion II ($B = K$) or conclusion III ($K > B$) is true.

Again, combining all (i), (ii) and (iii), we get

 $K = M \geq B > H \Rightarrow K > H$ (conclusion I). Hence, conclusion I ($K > H$) is true.

64. (e)
- $V \geq M$
- ... (i)

$N < V$... (ii)

$J > N$... (iii)

From (i) and (ii), no specific relation between M and N can be established. Hence, conclusion II ($M > N$) is not necessarily true.Again, from all (i), (ii) and (iii), no specific relation between J and M can be established. Hence, conclusion I ($J > M$) is not necessarily true. Again, from (ii) and (iii), no specific relation between V and J can be established. Hence, conclusion III ($V > J$) is not necessarily true.

65. (d)
- $A > B$
- ... (i)

$B \geq E$... (ii)

$F < E$... (iii)

Combining (i), (ii) and (iii), we get

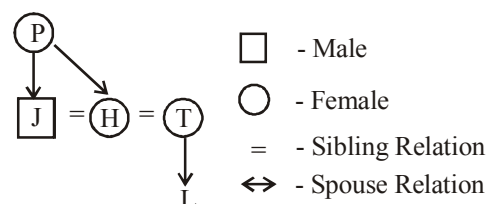
$A > B \geq E > F$

Hence, Conclusion I ($A > F$)Conclusion II ($F < B$)and Conclusion III ($E < A$) are true.

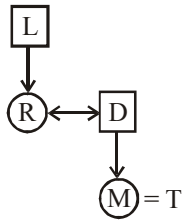
(66-70).

 $A + B \Rightarrow A$ is the father of B. $A \times B \Rightarrow A$ is the sister of B. $A \$ B \Rightarrow A$ is the wife of B. $A \% B \Rightarrow A$ is the mother of B. $A \div B \Rightarrow A$ is the son of B.

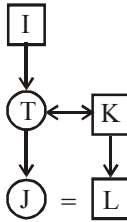
66. (a)
- $J \div P \% H \times T \% L$
- can be represented in diagram. As follows.



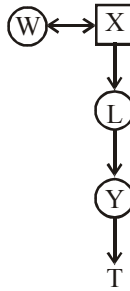
67. (b) $L + R \div D + M \times T$



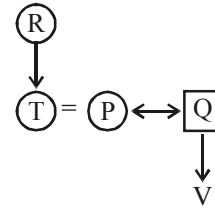
68. (b) $I + T \% J \times L \div K$



69. (d) $W \$ X + L + Y + T$



70. (d) $R \% T \times P \$ Q + V$



71. (a) Replace 'Bye' by 'By'.

73. (b) Replace 'desicions' by 'decisions'.

74. (a) Replace 'Traditionall' by 'traditionally'.

75. (d) Replace 'forrests' by 'forests'.

76. (c) One of the factors is the correct phrase.

77. (e) Sentence is correct.

78. (d) At current estimates is the correct phrase.

81. (d) The answer is in the first two lines of the first paragraph.

83. (c) 'Watch out for' here means that FMCG companies will have to be on the alert for competition from the emerging retailers.

84. (a) Paragraph 6 answers the question.

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INSTRUCTIONS

- This practice set consists of three sections. Quantitative Aptitude (Qs. 1-35); Reasoning Ability (Qs. 36-70) and English Language (Qs. 71-100).
- All the questions are compulsory.
- Each question has five options, of which only one is correct. The candidates are advised to read all the options thoroughly.
- There is negative marking equivalent to $1/4^{\text{th}}$ of the mark allotted to the specific question for wrong answer.

Time : 1 hour

Max. Marks : 100

QUANTITATIVE APTITUDE

DIRECTIONS (Qs. 1-10) : What will come in place of question mark (?) in the following questions ?

- 48% of 525 + ?% of 350 = 399
(a) 42 (b) 46 (c) 28
(d) 26 (e) None of these
- $\frac{3}{7}$ of $\frac{4}{5}$ of $\frac{5}{8}$ of 490 = ?
(a) 115 (b) 105 (c) 108
(d) 116 (e) None of these
- $\sqrt{7} + 17^2 = 335$
(a) 46 (b) 42 (c) 1764
(d) 2116 (e) None of these
- 125% of 560 + 22% of 450 = ?
(a) 799 (b) 700 (c) 782
(d) 749 (e) None of these
- $\frac{28 \times 5 - 15 \times 6}{7^2 + \sqrt{256} + (13)^2} = ?$
(a) $\frac{27}{115}$ (b) $\frac{22}{117}$ (c) $\frac{25}{117}$
(d) $\frac{22}{115}$ (e) None of these
- 18.76 + 222.24 + 3242.15 = ?
(a) 3384.15 (b) 3483.15 (c) 3283.25
(d) 3383.25 (e) None of these
- 784 ÷ 16 ÷ 7 = ?
(a) 49 (b) 14 (c) 21
(d) 7 (e) None of these
- $\frac{3}{2}$ of 455 + $\frac{5}{8}$ of 456 = ?
(a) 448 (b) 476 (c) 480
(d) 464 (e) None of these
- 1.05% of 2500 + 2.5% of 440 = ?
(a) 37.50 (b) 37.25 (c) 370.25
(d) 372.50 (e) None of these
- 4900 ÷ 28 × 444 ÷ 12 = ?
(a) 6575 (b) 6475 (c) 6455
(d) 6745 (e) None of these
- What is the compound interest accrued on an amount of Rs 8500 in two years @ interest 10% per annum?
(a) Rs 1875 (b) Rs 1885 (c) Rs 1775
(d) Rs 1765 (e) None of these
- A train running at the speed of 60 kmph crosses a 200 m long platform in 27 s. What is the length of the train ?
(a) 250m (b) 200m (c) 240m
(d) 450m (e) None of these
- 10 men can complete a piece of work in 8 days. In how many days can 16 men complete that work?
(a) 4 days (b) 5 days (c) 6 days
(d) 3 days (e) None of these
- If the numerator of a certain fraction increased by 100% and the denominator is increased by 200%; the new fraction thus formed is $\frac{4}{21}$. What is the original fraction?
(a) $\frac{2}{7}$ (b) $\frac{3}{7}$ (c) $\frac{2}{5}$
(d) $\frac{4}{7}$ (e) None of these

15. The ratio of the ages of A and B seven years ago was 3 : 4 respectively. The ratio of their ages nine years from now will be 7 : 8 respectively. What is B's age at present ?
 (a) 16 years (b) 19 years (c) 28 years
 (d) 23 years (e) None of these
16. The perimeter of a square is thrice the perimeter of a rectangle. If the perimeter of the square is 84 cm and the length of the rectangle is 8 cm, what is the difference between the breadth of the rectangle and the side of the square?
 (a) 15 cm (b) 19 cm (c) 10 cm
 (d) 8 cm (e) None of these
17. The area of a circle is equal to the area of a rectangle with perimeter equal to 42 m and breadth equal to 8.5 m. What is the area of the circle?
 (a) 116.25 sq m (b) 104.25 sq m (c) 146.25 sq m
 (d) 128.25 sq m (e) None of these
18. The product of 5% of a positive number and 3% of the same number is 504.6. What is half of that number?
 (a) 290 (b) 340 (c) 680
 (d) 580 (e) None of these
19. 4 women and 12 children together take four days to complete a piece of work. How many days will four children alone take to complete the piece of work if two women alone can complete the piece of work in 16 days?
 (a) 32 (b) 24 (c) 16
 (d) 12 (e) None of these
20. Anu walks 2.31 km in three weeks by walking an equal distance each day. How many metres does she walk each day?
 (a) 110m (b) 90m (c) 140m
 (d) 120m (e) None of these
21. A man riding a bicycle completes one lap of a square field along its perimeter at the speed of 43.2 km/hr in 1 minute 20 seconds. What is the area of the field?
 (a) 52900 sq m (b) 57600 sq m (c) 48400 sq m
 (d) Can't be determined (e) None of these
22. On Teacher's Day, 4800 sweets were to be equally distributed among a certain number of children. But on that particular day 100 children were absent. Hence, each child got four sweets extra. How many children were originally supposed to be there?
 (a) 300 (b) 400 (c) 540
 (d) 500 (e) Can't be determined.
23. The ratio of the monthly incomes of Sneha, Tina and Akriti is 95:110:116. If Sneha's annual income is ₹3,42,000, what is Akriti's annual income?
 (a) ₹3,96,900 (b) ₹5,63,500 (c) ₹4,17,600
 (d) ₹3,88,000 (e) None of these
24. A truck covers a distance of 256 km at the speed of 32 km/hr. What is the average speed of a car which travels a distance of 160 km more than the truck in the same time?
 (a) 46 kmh⁻¹ (b) 52 kmh⁻¹ (c) 49 kmh⁻¹
 (d) 64 kmh⁻¹ (e) None of these
25. In an examination, the maximum aggregate marks is 1020. In order to pass the exam a student is required to obtain 663 marks out of the aggregate marks. Shreya obtained 612 marks. By what per cent did Shreya fail the exam?

- (a) 5% (b) 8% (c) 7%
 (d) Can't be determined
 (e) None of these

DIRECTIONS (Qs. 26-30): Study the following information and answer the questions that follow :

The premises of a bank are to be renovated. The renovation is in terms of flooring. Certain areas are to be floored either with marble or wood. All rooms/halls and pantry are rectangular. The area to be renovated comprises of a hall for customer transaction measuring 23 m by 29 m, branch manager's room measuring 13 m by 17 m, a pantry measuring 14 m by 13 m, a record keeping cum server room measuring 21 m by 13 m and locker area measuring 29 m by 21 m. The total area of the bank is 2000 square meters. The cost of wooden flooring is ₹ 170/- per square meter and the cost of marble flooring is ₹ 190/- per square meter. The locker area, record keeping cum server room and pantry are to be floored with marble. The branch manager's room and the hall for customer transaction are to be floored with wood. No other area is to be renovated in terms of flooring.

26. What is the respective ratio of the total cost of wooden flooring to the total cost of marble flooring ?
 (a) 1879 : 2527 (b) 1887 : 2386
 (c) 1887 : 2527 (d) 1829 : 2527
 (e) 1887 : 2351
27. If the four walls and ceiling of the branch managers room (The height of the room is 12 meters) are to be painted at the cost of ₹ 190/- per square meter, how much will be the total cost of renovation of the branch manager's room including the cost of flooring ?
 (a) ₹ 1,36,800/- (b) ₹ 2,16,660/-
 (c) ₹ 1,78,790/- (d) ₹ 2,11,940/-
 (e) None of these
28. If the remaining area of the bank is to be carpeted at the rate of ₹ 110/- per square meter, how much will be the increment in the total cost of renovation of bank premises ?
 (a) ₹ 5,820/- (b) ₹ 4,848/-
 (c) ₹ 3,689/- (d) ₹ 6,890/-
 (e) None of these
29. What is the percentage area of the bank that is not to be renovated ?
 (a) 2.2 (b) 2.4
 (c) 4.2 (d) 4.4
 (e) None of these
30. What is the total cost of renovation of the hall for customer transaction and the locker area ?
 (a) ₹ 2,29,100/- (b) ₹ 2,30,206/-
 (c) ₹ 2,16,920/- (d) ₹ 2,42,440/-
 (e) None of these

DIRECTIONS (Qs. 31-35) : What should come in place of question mark (?) in the following number series?

31. 8 52 ? 1287 4504.5 11261.25 16891.875
 (a) 462 (b) 286 (c) 194
 (d) 328 (e) None of these

32. 3 42 504 ? 40320 241920 967680
 (a) 6048 (b) 5544 (c) 4536
 (d) 5040 (e) None of these
33. 403 400 394 382 358 310 ?
 (a) 244 (b) 210 (c) 214
 (d) 256 (e) None of these
34. 7 8 4 13 -3 22 ?
 (a) -7 (b) -10 (c) -12
 (d) -14 (e) None of these
35. 250000 62500 12500 3125 625 ? 31.25
 (a) 156.25 (b) 172.25 (c) 125
 (d) 150 (e) None of these

REASONING ABILITY

DIRECTIONS (Qs. 36-40) : Study the following information carefully and answer the questions carefully :

Five experts on Nino-technology involved in an international Research Project hold a Quarterly Review Meeting in Singapore. There are certain limitations on their language skills. Expert R1 knows only Japanese and Hindi; R2 is good at Japanese and English; R3 is good at English and Hindi; R4 knows French and Japanese quite well, and R5, an Indian, knows Hindi, English, and French.

36. Besides R5, which of the following can converse with R4 without an interpreter?
 (a) Only R1 (b) Only R2
 (c) Only R3 (d) Both R1 and R2
 (e) None of these
37. Which of the following cannot converse without an interpreter?
 (a) R2 and R5 (b) R1 and R2
 (c) R1 and R3 (d) R3 and R4
 (e) None of these
38. Choose the language that is least commonly used at the meeting.
 (a) English (b) French
 (c) Japanese (d) Hindi
 (e) None of these
39. Which of the following can act as an interpreter when R3 and R4 wish to discuss?
 (a) Only R1 (b) Only R2
 (c) Only R5 (d) All of the above
 (e) None of these
40. Suppose a sixth Expert R6 joins the session. Which are the languages that he should know so that a maximum number of original experts are able to understand him?
 (a) English and French
 (b) Japanese and Hindi
 (c) English and Hindi
 (d) French and Japanese
 (e) None of these

DIRECTIONS (Qs. 41-43): Study the following information carefully and answer the questions carefully :

In the English alphabet, letters from A to M denote numeric values from 1 to 13 (such that A is 1, B is 2,) and letters from N to Z denote numeric values from -13 to -1 (such that N is -13, O is -12,).

41. The numeric value of which of the following equations will be a whole number?
 (a) KISS/RAPP (b) HIS/HELL
 (c) HISS/YOUR (d) KISS/HELL
 (e) None of these
42. Assuming that the salaries are basically coded with the help of employee names using the code given above, who among the following will be drawing the highest salary?
 (a) PREM (b) SHAN
 (c) RAMU (d) RHAN
 (e) None of these
43. Following the above mentioned code, which of the following will be true?
 (a) GS - TSZ = 0 (b) PRO = DLW
 (c) ROD = YET (d) ROD = DLW
 (e) None of these

DIRECTIONS (Qs. 44-48): Study the following information carefully and answer the questions carefully :

In a Public Sector Undertaking Township, there are five executives - Ambrish, Amit, Rohit, Manu and Tarun and they stay in five different flats, numbered 1 to 5.

- Two of them play Cricket while the other three play different games viz. Football, Tennis and Chess.
 - One Cricket player and a Chess player stay in the third flat, whereas the other three stay in different flats, i.e. 2nd, 4th and 5th.
 - Two of these five players are mechanical engineers while the other three are quality inspector, design engineer, and power engineer respectively.
 - The chess player is the oldest in age while one of the cricket players, who plays at the national level, is the youngest in age.
 - The age of the other cricket player, who plays at the regional level, lies between the football player and the chess player.
 - Manu is a regional level player and stays in the 3rd flat while Tarun is a quality inspector and stays in the 5th flat.
 - The football player is a design engineer and stays in the 2nd Flat.
 - Amit is a power engineer and plays Chess while Ambrish is the mechanical engineer and plays Cricket at the national level.
44. Who stays in the 4th flat?
 (a) Ambrish (b) Amit
 (c) Rohit (d) Manu
 (e) None of these
45. Which sport does Tarun play?
 (a) Chess (b) Football
 (c) Cricket (d) Tennis
 (e) None of these
46. Who plays football?
 (a) Ambrish (b) Amit
 (c) Rohit (d) Manu
 (e) None of these
47. Who stay in the same flat?
 (a) Ambrish and Amit
 (b) Maim and Tarun
 (c) Amit and Manu
 (d) Rohit and Tarun
 (e) None of these

48. The Chess player is a:
 (a) Power engineer
 (b) Mechanical Engineer
 (c) Design engineer
 (d) Quality inspector
 (e) None of these

DIRECTIONS (Qs. 49-51) : Study the information given below carefully to answer the following questions.

In a certain code language the following lines written as:

'lop eop aop fop' means 'Traders are above laws'

'fop cop bop gop' means 'Developers were above profitable'

'aop bop uop qop' means 'Developers stopped following traders'

'cop jop eop uop' means 'Following maps were laws'

49. 'Developers are following laws' would be correctly written as
 (a) 'bop cop uop eop' (b) 'lop bop eop uop'
 (c) 'oup cop lop aop' (d) 'gop cop uop qop'
 (e) None of these
50. 'qop gop cop eop' would correctly mean
 (a) profitable laws were stopped
 (b) developers stopped following laws
 (c) traders were above profitable
 (d) were laws profitable traders
 (e) None of the above
51. 'aop qop bop' would correctly mean
 (a) following were above
 (b) traders stopped developers
 (c) developers are laws
 (d) traders above stopped
 (e) laws are stopped

DIRECTIONS (Qs. 52-56) : In each of the questions below are given four statements followed by three conclusions numbered I, II and III. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follows from the given statements disregarding commonly known facts.

52. Statements: All petals are flowers. Some flowers are buds. Some buds are leaves. All leaves are plants.
 Conclusions: I. Some petals are not buds.
 II. Some flowers are plants.
 III. No flower is plant.
 (a) Only I follows (b) Either II or III follows
 (c) I and II follow (d) Only III follows
 (e) None of the above
53. Statements: Some pens are keys. Some keys are locks. All locks are cards. No card is paper
 Conclusions:
 I. No lock is paper.
 II. Some cards are keys.
 III. Some keys are not paper.
 (a) I and II follow (b) Only I follows
 (c) Only II follows (d) All follow
 (e) None follows
54. Statements: Some pearls are gems. All gems are diamonds. No diamond is stone. Some stones are corals.

Conclusions:

I. Some stones are pearls.

II. Some corals being diamond is a possibility.

III. No stone is pearl.

- (a) Only I follows (b) Only II follows
 (c) Either I or III follows (d) I and II follow
 (e) None of these
55. Statements: Some apartments are flats. Some flats are buildings. All buildings are bungalows. All bungalows are gardens.
 Conclusions:
 I. All apartments being building is a possibility
 II. All bungalows are not buildings.
 III. No flat is garden.
 (a) None follows (b) Only I follows
 (c) Either I or III follows (d) II and III follow
 (e) Only II follows
56. Statements: All chairs are tables. All tables are bottles. Some bottles are jars. No jar is bucket.
 Conclusions:
 I. Some tables being jar is a possibility.
 II. Some bottles are chairs.
 III. Some bottles are not bucket.
 (a) Only I follows (b) I and II follow
 (c) All follow (d) Only II follows
 (e) None of these

DIRECTIONS (Qs. 57-61) : In these questions the symbols @, #, \$, % and * are used with different meanings as follow.

'A @ B' means 'A is not smaller than B'.

'A # B' means 'A is neither smaller than nor equal to B'.

'A \$ B' means 'A is neither greater than nor smaller than B'.

'A % B' means 'A is not greater than B'.

'A * B' means 'A is neither greater than nor equal to B'.

In each questions, four statements showing relationships have been given, which are followed by three conclusions I, II and III. Assuming that the given statements are true, find out which conclusion (s) is/are definitely true?

57. **Statements:** V \$ Y, Y @ Z, Z % X, X # T

Conclusions:

I. T # Z

II. X # Y

III. Z * Y

- (a) None follows (b) Only I follows
 (c) II and III follow (d) I and III follow
 (e) Only III follows

58. **Statements:** R @ J, J % F, F * E, E % M

Conclusions:

I. M # J

II. F % M

III. M * R

- (a) Only I follows (b) Only II follows
 (c) Only III follows (d) I and II follow
 (e) All follow

59. **Statements:** H # R, R @ L, L * W, W % F

Conclusions:

I. H # J

II. F # L

III. H \$ F

- (a) Only I follows (b) I and II follow
 (c) II and III follow (d) Either I or II follows
 (e) All follow

60. **Statements:** M # K, M \$ F, F % Q, Q ★ H
Conclusions:
 I. H # K
 II. Q # K
 III. Q @ M
 (a) I and II follow (b) Either I or II follows
 (c) All follow (d) II and III follow
 (e) None of the above
61. **Statements:** D ★ Q, Q \$ L, L # T, T % H
Conclusions:
 I. D ★ L
 II. L @ H
 III. H # L
 (a) Only I follows (b) I and II follow
 (c) Either II or III follows (d) All follow
 (e) None follow

DIRECTIONS (Qs. 62-66) : Each of the questions below consists of a question and two statements numbered I and II are given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and

Give answer:

- (a) If the data in Statements I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question
 (b) If the data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question
 (c) If the data in Statement I alone or in Statement II alone is sufficient to answer the question
 (d) If the data in both the Statements I and II are not sufficient to answer the question
 (e) If the data in both the Statements I and II together are necessary to answer the question
62. How many children are there in the group if no two children have same weight?
Statements:
 I. Sahil is fifth from the top in order of weight if all the children in the group were arranged in descending order.
 II. Ramesh, who is heavier than 14 children in the group is immediately next to Sahil in weight.
63. What is the code for 'healthy' in the code language?
Statements:
 I. In the code language 'cat healthy food' is written as 'ka mare'.
 II. In code language 'food for healthy people' is written as 'ta ma jo re'.
64. How many brothers does 'H' have?
Statements:
 I. 'H' is sister of 'K' who is son of 'T'.
 II. T is mother of 'K' who is brother of 'H'.
65. Who among J, T, W, R and Q reached the office first?
Statements:
 I. J reached before Q, R and T but after W.
 II. Q reached before R but after W.
66. Village 'F' is in which direction with respect to village 'K'?
Statements:

- I. Village 'J' is to the East of village 'F' and to the North of village 'K'.
 II. Village 'R', which is to the South of village 'F' is to the West of village 'K'.

DIRECTIONS (Qs. 67-70) : Read the following passage carefully and answer the Question given below it.

Six friends Abhishek, Deepak, Mridul, Pritam, Ranjan and Salil married within a year in the months of February, April, July, September, November and December and in the cities of Ahmedabad, Bengaluru, Chennai, Delhi, Mumbai and Kolkata, but not necessarily following the above order. The brides' names were Geetika, Jasmine, Hema, Brinda, Ipsita and Veena, once again not following any order. The following are some facts about their weddings.

- (i) Mridul's wedding took place in Chennai, however he was not married to Geetika or Veena
 (ii) Abhishek's wedding took place in Ahmedabad and Ranjan's in Delhi; however neither of them was married to Jasmine or Brinda
 (iii) The wedding in Kolkata took place in February
 (iv) Hema's wedding took place in April, but not in Ahmedabad
 (v) Geetika and Ipsita got married in February and November and in Chennai and Kolkata but not following the above order
 (vi) Pritam visited Bengaluru and Kolkata only after his marriage in December
 (vii) Salil was married to Jasmine in September
67. Hema's husband is
 (a) Abhishek (b) Deepak
 (c) Ranjan (d) Pritam
 (e) Mridul
68. Deepak's wedding took place in
 (a) Bengaluru (b) Mumbai
 (c) Kolkata (d) Delhi
 (e) Chennai
69. In Mumbai, the wedding of one of the friends took place in the month of
 (a) April (b) September
 (c) November (d) December
 (e) July
70. Salil's wedding was held in
 (a) Bengaluru (b) Chennai
 (c) Kolkata (d) Delhi
 (e) Mumbai

ENGLISH LANGUAGE

DIRECTIONS (Qs. 71-82) : Read the following passage carefully and answer the questions given below it. Certain words have been printed in bold to help you locate them while answering some of the questions.

Govind's father was a rich landlord, who was loved and respected by all his tenants. When he died, he left large tracts of land to Govind. But Govind did not **spend** a single day looking after his land. He had a funny idea, that there existed a magic potion which, if it was poured on any object would turn it into gold. He spent all his time trying to learn more about this potion.

People took advantage of him and cheated him. His wife grew anxious. Given the amount of money Govind was spending, she was sure that they would soon be paupers.

One day, a widely respected sage who had been to the Himalayas came to their town. Govind asked him about the potion. To his surprise the sage answered, "I have learnt how to brew such a potion. But it is a difficult process." "Tell me!" insisted Govind, hardly able to believe his luck. "You have to collect the dew which settles on the leaves of a banana tree every morning during winter. There is a condition though. The tree should be planted and watered regularly with your own hands. Store the collected dew in an earthen vessel and when you have five litres, bring it to me. I will recite a sacred mantra to transform the dew into the potion. A drop of the potion will be sufficient to change any object into gold."

Govind was worried "Winter is only for a few months in the year. It will take me years to collect the dew." "you can plant as many trees as you want," replied the sage. Govind went home and after talking to his wife, began clearing the large fields which has been **lying** vacant for years. He planted rows of banana saplings. He **tended** them with great care. His wife helped him too. She would take the banana crop to market and get a good price. Over the years the plantation grew and finally after six years Govind had five litres of dew. He went to the sage who smiled, uttered a mantra and sprinkled a few drops of dew on a copper vessel. To Govind's **dismay**, nothing happened. "you have cheated me!" he shouted at the sage.

The sage however smiled. Govind's wife then came forward with a box. The sage opened it and revealed stacks of gold coins inside. Turning to Govind he said, "you worked hard on your land and created a plantation. Your wife sold 'the produce in the market. It was your hard work which created this wealth, not magic. If I had told you this earlier, you would not have listened." Govind understood the wisdom behind the sage's words and worked even harder from that day on.

71. Why did Govind's father give him large plots of land?
- It was his way of instilling a sense of responsibility in his son
 - Govind was his only son and sole heir
 - To provide Govind with sufficient funds to pursue his interest of discovering a magic potion
 - He wanted Govind to continue to look after the tenants
 - None of these
72. Which of the following can be said about the sage?
- He was cunning and plotted with Govind's wife to cheat him.
 - He had no magical powers as such and used to swindle people
 - He was a good judge of people
 - He did not deserve his good reputation
 - He was dishonest because he had cheated Govind out of his gold
73. Why was Govind's wife worried ?
- Govind had no knowledge of farming and could not cultivate the land he had inherited from his father
 - Govind had not friends because he was obsessed with finding a potion which would turn any thing into gold
 - Govind was only interested in studying under different sages and neglected his family duties

- Since Govind had devoted all his time and wealth to finding a magic potion they would soon be poor
 - Govind's experiments to find a magic potion were dangerous
74. Why did Govind's wife help him in the fields?
- To support her husband in his endeavour to find a magic potion.
 - The sage had advised her to help her husband succeed.
 - He needed someone to help him collect the dew.
- only (B)
 - only (A)
 - Both (A) and (B)
 - All (A), (B) and (C)
 - None of these
75. Why did Govind decide to cultivate a banana crop?
- The soil of his land was suitable only for cultivating bananas
 - It was the most highly priced commodity in the region
 - It could be grown at any time of the year including winter
 - His wife pressurised him to do so
 - The ingredient for the magic potion could only be obtained from a banana tree
76. What made Govind angry with the sage?
- The sage had conspired with Govind's wife against him
 - He had forgotten the magic spell and all Govind's hard work was in vain
 - He had lost a good deal of money in cultivating bananas
 - The sage had made a fool of him in front of other villagers
 - None of these
77. How did Govind acquire his dream of gold finally ?
- The sage gave him gold as a reward for his hard work was in vain
 - His wife diligently saved the gold he had received from his father
 - By selling the banana plantation
 - His wife sold bananas at a higher price than others did
 - None of these
78. Which of the following is **TRUE** in the context of the passage?
- Govind was easily fooled by people
 - Govind was preserving by nature
 - The sage had never actually been to the Himalayas
- Only (A)
 - Both (A) and (B)
 - Only (C)
 - Both (A) and (C)
 - None of these
-
- DIRECTIONS (Qs. 79-80) : Choose the word which is most similar in meaning to the word printed in bold as used in the passage.**
79. **SPEND**
- pay
 - bought
 - devote
 - settle
 - empty

80. **LYING**

- (a) sleeping (b) dishonest
(c) relaxing (d) remaining
(e) untruthful

DIRECTIONS (Qs. 81-82) : Choose the word which is most opposite in meaning to the word printed in bold as used in the passage.

81. **DISMAY**

- (a) joy (b) interest
(c) desire (d) humour
(e) luck

82. **TENDED**

- (a) negligible (b) watched
(c) inclined (d) ignored
(e) spoil

DIRECTIONS (Qs. 83-85) : Which of the following phrases (a), (b), (c) and (d) given below each sentence should replace the phrase printed in bold in the sentence to make it grammatically correct? If the sentence is correct as it is given and 'No correction is required', mark (e) as the answer.

83. **Starting out my** own business at this time would affect the financial stability of my family.
(a) Starting up my (b) For starting with
(c) To start out mine (d) By starting my
(e) No correction required
84. **Use a tactic for** mixing the inferior with good quality rice is dishonest and you will lose your license.
(a) Using tacti as (b) Using a tactic like
(c) To use tactics (d) Used to tactics like
(e) No correction required
85. The company **will invest more** six hundred crores in the next five years to expand its operations in Britain.
(a) will future invest
(b) has invested more than
(c) have invested over
(d) will be invested above
(e) No correction required

DIRECTIONS (Qs. 86-90) : In each question below a sentence with four words printed in bold type is given. These are numbered as (a), (b), (c) and (d). One of these four words printed in bold may be either wrongly spelt or inappropriate in the context of the sentence. Find out the word which is wrongly spelt or inappropriate if any. The number of that word is your answer. If all the words printed in bold are correctly spelt and also appropriate in the context of the sentence, mark (e) i.e. 'All correct' as your answer.

86. Under **existing** (a) / regulations we are not **permitted** (b) / to **owe** (c) / more than a forty percent **share** (d) / of the family business. All correct (e).
87. In case of any land **dispute** (a) / panchayat **officials** (b) / will **determine** (c) / how the property is to be **dividend** (d) / All correct (e).

88. The World Bank has **consented** (a) / to **sanction** (b) / the **necessary** (c) / **finance** (d) / for the project. All correct (e).

89. To **obtain** (a) / a refund you will have to **fill** (b) / a **claim** (c) / with the **appropriate** (d) / authority. All correct (e).

90. Experts **predict** (a) / there will be **shortage** (b) / of **investment** (c) / in the **infrastructure** (d) / sector. All correct (c).

DIRECTIONS (Qs. 91-92) : Rearrange the following six sentences (A), (B), (C), (D), (E) and (F) in the proper sequence to form a meaningful paragraph; then answer the questions given below them.

- A. The hall was filled with children, teachers, students, family members and those who were close to him.
B. Normally such ceremonies are attended by important people like industrialists, politicians and VIP's.
C. What I saw when I stepped into the hall amazed me.
D. I went home with the feeling that it was a most unusual oath taking ceremony with only those who were 'important' to him present.
E. When he was elected President, he invited me to the swearing in ceremony in the Central Hall of Parliament.
F. However in this case everyone who attended the ceremony seemed to know him personally.
91. Which of the following should be the **FIRST** sentence after rearrangement?
(a) A (b) B
(c) C (d) D
(e) E
92. Which of the following should be the **SECOND** sentence after rearrangement?
(a) B (b) C
(c) D (d) E
(e) F

DIRECTIONS (Qs. 93-100) : In the following passage there are blanks each of which has been numbered. These numbers are printed below the passage and against each, five words are suggested, one of which fits the blank appropriately. Find out the appropriate words in each case.

When we **93** started thirty years ago in 1977, we did not know anything about how to run a bank for the poor. We therefore looked at how others ran their operations and **94** from their mistakes. In Bangladesh, conventional banks and credit co-operatives always **95** lump sum repayments. This created **96** problems because repaying in a lump sum was a mental hurdle for borrowers. They tended to delay repayment and get further into debt in the **97**. In the end they usually **98** totally on the loan, which was a loss to the bank. In structuring our own loans, I decided to ask for a daily payment, Monitoring repayment was **99** and it filled people with **100** that they could repay their loans.

93. (a) firstly (b) freshly
(c) foremost (d) initially
(e) recently
94. (a) copied (b) observed
(c) learned (d) understood
(e) improving

95. (a) asked (b) insisted
(c) demanded (d) settled
(e) lend
96. (a) severe (b) no
(c) additionally (d) variety
(e) plenty
97. (a) time (b) process
(c) return (d) event
(e) action
98. (a) neglected (b) abandoned
(c) defaulted (d) depended
(e) disappointed
99. (a) benefit (b) easier
(c) reckless (d) disorganised
(e) secure
100. (a) sense (b) confidence
(c) challenge (d) doubt
(e) believe

RESPONSE SHEET

- | | | | | |
|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|
| 1. (a) (b) (c) (d) (e) | 2. (a) (b) (c) (d) (e) | 3. (a) (b) (c) (d) (e) | 4. (a) (b) (c) (d) (e) | 5. (a) (b) (c) (d) (e) |
| 6. (a) (b) (c) (d) (e) | 7. (a) (b) (c) (d) (e) | 8. (a) (b) (c) (d) (e) | 9. (a) (b) (c) (d) (e) | 10. (a) (b) (c) (d) (e) |
| 11. (a) (b) (c) (d) (e) | 12. (a) (b) (c) (d) (e) | 13. (a) (b) (c) (d) (e) | 14. (a) (b) (c) (d) (e) | 15. (a) (b) (c) (d) (e) |
| 16. (a) (b) (c) (d) (e) | 17. (a) (b) (c) (d) (e) | 18. (a) (b) (c) (d) (e) | 19. (a) (b) (c) (d) (e) | 20. (a) (b) (c) (d) (e) |
| 21. (a) (b) (c) (d) (e) | 22. (a) (b) (c) (d) (e) | 23. (a) (b) (c) (d) (e) | 24. (a) (b) (c) (d) (e) | 25. (a) (b) (c) (d) (e) |
| 26. (a) (b) (c) (d) (e) | 27. (a) (b) (c) (d) (e) | 28. (a) (b) (c) (d) (e) | 29. (a) (b) (c) (d) (e) | 30. (a) (b) (c) (d) (e) |
| 31. (a) (b) (c) (d) (e) | 32. (a) (b) (c) (d) (e) | 33. (a) (b) (c) (d) (e) | 34. (a) (b) (c) (d) (e) | 35. (a) (b) (c) (d) (e) |
| 36. (a) (b) (c) (d) (e) | 37. (a) (b) (c) (d) (e) | 38. (a) (b) (c) (d) (e) | 39. (a) (b) (c) (d) (e) | 40. (a) (b) (c) (d) (e) |
| 41. (a) (b) (c) (d) (e) | 42. (a) (b) (c) (d) (e) | 43. (a) (b) (c) (d) (e) | 44. (a) (b) (c) (d) (e) | 45. (a) (b) (c) (d) (e) |
| 46. (a) (b) (c) (d) (e) | 47. (a) (b) (c) (d) (e) | 48. (a) (b) (c) (d) (e) | 49. (a) (b) (c) (d) (e) | 50. (a) (b) (c) (d) (e) |
| 51. (a) (b) (c) (d) (e) | 52. (a) (b) (c) (d) (e) | 53. (a) (b) (c) (d) (e) | 54. (a) (b) (c) (d) (e) | 55. (a) (b) (c) (d) (e) |
| 56. (a) (b) (c) (d) (e) | 57. (a) (b) (c) (d) (e) | 58. (a) (b) (c) (d) (e) | 59. (a) (b) (c) (d) (e) | 60. (a) (b) (c) (d) (e) |
| 61. (a) (b) (c) (d) (e) | 62. (a) (b) (c) (d) (e) | 63. (a) (b) (c) (d) (e) | 64. (a) (b) (c) (d) (e) | 65. (a) (b) (c) (d) (e) |
| 66. (a) (b) (c) (d) (e) | 67. (a) (b) (c) (d) (e) | 68. (a) (b) (c) (d) (e) | 69. (a) (b) (c) (d) (e) | 70. (a) (b) (c) (d) (e) |
| 71. (a) (b) (c) (d) (e) | 72. (a) (b) (c) (d) (e) | 73. (a) (b) (c) (d) (e) | 74. (a) (b) (c) (d) (e) | 75. (a) (b) (c) (d) (e) |
| 76. (a) (b) (c) (d) (e) | 77. (a) (b) (c) (d) (e) | 78. (a) (b) (c) (d) (e) | 79. (a) (b) (c) (d) (e) | 80. (a) (b) (c) (d) (e) |
| 81. (a) (b) (c) (d) (e) | 82. (a) (b) (c) (d) (e) | 83. (a) (b) (c) (d) (e) | 84. (a) (b) (c) (d) (e) | 85. (a) (b) (c) (d) (e) |
| 86. (a) (b) (c) (d) (e) | 87. (a) (b) (c) (d) (e) | 88. (a) (b) (c) (d) (e) | 89. (a) (b) (c) (d) (e) | 90. (a) (b) (c) (d) (e) |
| 91. (a) (b) (c) (d) (e) | 92. (a) (b) (c) (d) (e) | 93. (a) (b) (c) (d) (e) | 94. (a) (b) (c) (d) (e) | 95. (a) (b) (c) (d) (e) |
| 96. (a) (b) (c) (d) (e) | 97. (a) (b) (c) (d) (e) | 98. (a) (b) (c) (d) (e) | 99. (a) (b) (c) (d) (e) | 100. (a) (b) (c) (d) (e) |

Answer Key

1	(a)	11	(e)	21	(b)	31	(b)	41	(d)	51	(b)	61	(e)	71	(b)	81	(a)	91	(e)
2	(b)	12	(a)	22	(b)	32	(d)	42	(a)	52	(b)	62	(e)	72	(c)	82	(d)	92	(a)
3	(d)	13	(b)	23	(c)	33	(c)	43	(a)	53	(d)	63	(d)	73	(d)	83	(a)	93	(d)
4	(a)	14	(a)	24	(b)	34	(d)	44	(a)	54	(e)	64	(c)	74	(e)	84	(b)	94	(c)
5	(c)	15	(d)	25	(a)	35	(a)	45	(d)	55	(a)	65	(a)	75	(e)	85	(a)	95	(a)
6	(b)	16	(a)	26	(c)	36	(d)	46	(c)	56	(c)	66	(c)	76	(b)	86	(e)	96	(a)
7	(d)	17	(e)	27	(c)	37	(d)	47	(c)	57	(a)	67	(c)	77	(c)	87	(d)	97	(b)
8	(c)	18	(d)	28	(e)	38	(b)	48	(a)	58	(a)	68	(c)	78	(a)	88	(a)	98	(c)
9	(b)	19	(b)	29	(b)	39	(d)	49	(b)	59	(b)	69	(d)	79	(c)	89	(b)	99	(b)
10	(b)	20	(a)	30	(a)	40	(b)	50	(a)	60	(e)	70	(a)	80	(d)	90	(c)	100	(b)

Answers & Explanations

1. (a) $48\% \text{ of } 525 + ?\% \text{ of } 350 = 399$

$$\Rightarrow \frac{48}{100} \times 525 + \frac{?}{100} \times 350 = 399$$

$$\Rightarrow 25200 + ? \times 350 = 399 \times 100$$

$$\Rightarrow ? \times 350 = 39900 - 25200 = 14700$$

$$\Rightarrow ? = \frac{14700}{350} = 42$$

2. (b) $? = \frac{3}{7} \text{ of } \frac{4}{5} \text{ of } \frac{5}{8} \text{ of } 490$

$$\Rightarrow ? = \frac{3}{7} \times \frac{4}{5} \times \frac{5}{8} \times 490$$

$$\Rightarrow ? = 35 \times 3 = 105$$

3. (d) $\sqrt{?} + 17^2 = 335$

$$\Rightarrow \sqrt{?} + 289 = 335$$

$$\Rightarrow \sqrt{?} = 335 - 289 = 46$$

$$\Rightarrow ? = 46 \times 46 = 2116$$

4. (a) $? = 125\% \text{ of } 560 + 22\% \text{ of } 450$

$$\Rightarrow ? = \frac{125}{100} \times 560 + \frac{22}{100} \times 450$$

$$\Rightarrow ? = \frac{70000}{100} + \frac{9900}{100}$$

$$\Rightarrow ? = 700 + 99 = 799$$

5. (c) $? = \frac{28 \times 5 - 15 \times 6}{7^2 + \sqrt{256} + (13)^2}$

$$\Rightarrow ? = \frac{140 - 90}{49 + 16 + 169}$$

$$\Rightarrow ? = \frac{50}{234} = \frac{25}{117}$$

6. (b) $? = 18.76 + 222.24 + 3242.15$

$$\Rightarrow ? = 3483.15$$

7. (d) $? = 784 \div 16 \div 7$

$$\Rightarrow ? = \frac{784}{16} \div 7$$

$$\Rightarrow ? = 49 \div 7 = 7$$

8. (c) $? = \frac{3}{7} \text{ of } 455 + \frac{5}{8} \text{ of } 456$

$$\Rightarrow ? = \frac{3}{7} \times 455 + \frac{5}{8} \times 456$$

$$\Rightarrow ? = 195 + 285$$

$$\Rightarrow ? = 480$$

9. (b) $? = 1.05\% \text{ of } 2500 + 2.5\% \text{ of } 440$

$$\Rightarrow ? = \frac{1.05}{100} \times 2500 + \frac{2.5}{100} \times 440$$

$$\Rightarrow ? = \frac{2625}{100} + \frac{1100}{100}$$

$$\Rightarrow ? = \frac{3725}{100} = 37.25$$

10. (b) $? = 4900 \div 28 \times 444 \div 12$

$$\Rightarrow ? = 175 \times 37$$

$$\Rightarrow ? = 6475$$

11. (e) Compound Interest after two years

$$= 8500 \left(1 + \frac{10}{100} \right)^2 - 8500$$

$$= 8500 \times \frac{11}{10} \times \frac{11}{10} - 8500$$

$$= 10285 - 8500 = ₹ 1785$$

12. (a) Let length of the train be x m
 Speed of the train be $60 \text{ km/h} = 60 \times \frac{5}{18} = \frac{50}{3} \text{ m/s}$
 Then, $\frac{x+200}{\frac{50}{3}} = 27$
 $\Rightarrow \frac{3(x+200)}{50} = 27$
 $\Rightarrow 3x+600 = 1350$
 $\Rightarrow 3x = 1350 - 600$
 $\Rightarrow 3x = 750$
 $\Rightarrow x = \frac{750}{3} = 250 \text{ m}$
13. (b) Suppose 16 men can complete the same work in x days
 Then,

Men	days
16	x

 $16 : 10 :: 8 : x$
 $\Rightarrow 16 \times x = 10 \times 8$
 $\Rightarrow x = \frac{10 \times 8}{16} = 5 \text{ days}$
14. (a) Let the original fraction be $\frac{x}{y}$.
 $\therefore \frac{x \times 200}{y \times 300} = \frac{4}{21} \Rightarrow \frac{x}{y} = \frac{4}{21} \times \frac{3}{2} = \frac{2}{7}$
15. (d) Let the present age of A = x and B = y years
 According to first condition
 $\frac{x-7}{y-7} = \frac{3}{4} \Rightarrow 4x-28=3y-21 \Rightarrow 4x-3y=7 \dots\dots (i)$
 According to second condition
 $\frac{x+9}{y+9} = \frac{7}{8} \Rightarrow 8x+72=7y+63$
 $\Rightarrow 7y-8x=9 \dots\dots (ii)$
 $8x-6y=14$
 $7y-8x=9$
 $y=23 \text{ years.}$
16. (a) Perimeter of the square = 84 cm
 Perimeter of the rectangle = 28 cm
 Perimeter of the rectangle = $2(1+b)$
 or, $2(8+b) = 28 \text{ cm}$
 or, $b = 14 - 8 = 6 \text{ cm.}$
 \therefore Breadth of the rectangle = 6 cm
 Side of the square = $\frac{84}{4} = 21 \text{ cm}$
 Difference = $21 - 6 = 15 \text{ cm.}$
17. (e) Perimeter of the rectangle = 42 m
 $2(l+b) = 42 \text{ m}$
 or, $l+8.5 = 21 \text{ m}$
 or, $l = 12.5 \text{ m.}$
 Area of the rectangle = $12.5 \times 8.5 = 106.25 \text{ sq.m.}$
 \therefore Area of the circle = 106.25 sq.m.
18. (d) Let the positive number be x .
 Then, $\frac{5x}{100} \times \frac{3x}{100} = 504.6$
 $\therefore x \times \frac{5}{100} \times x \times \frac{3}{100} = 504.6$
 or, $x^2 = \frac{504.6 \times 100 \times 100}{15}$
 $\therefore x = 580.$
19. (b) Two women alone can complete a piece of work in 16 days.
 \therefore Four women can complete the same work in 8 days.
 Since 12 children can complete the work in $\frac{4 \times 8}{8-4} = \frac{4 \times 8}{4} = 8 \text{ days.}$
 \therefore Four children can complete the work in $\frac{12 \times 8}{4} = 24 \text{ days.}$
20. (a) $2.31 \text{ km} = 2.31 \times 1000 = 2310 \text{ m}$
 Total number of days = $3 \times 7 = 21$
 \therefore Distance covered by Anu each day = $\frac{2310}{21} = 110 \text{ m.}$
21. (b) $43.2 \text{ m/hr} = 43.2 \times \frac{5}{18} = 12 \text{ m/s}$
 Total distance covered = $12 \times 80 = 960 \text{ m.}$
 Perimeter of the square = 960 m.
 Side of the square = 240 m.
 Area = $(240)^2 = 57600 \text{ sqm.}$
22. (b) Let the number of children be x .
 Now, according to the question
 $\left(\frac{4800}{x} - 100\right)(x+4) = 4800$
 or, $\left(\frac{48}{x} - 1\right)(x+4) = 48$
 or, $(48-x)(x+4) = 48x$
 or, $x^2 + 4x - 192 = 0$
 or, $(x+16)(x-12) = 0$
 $\therefore x = 12 \text{ sweets}$
 Number of students = $\frac{4800}{12} = 400.$
23. (c) Sneha's monthly income = $\frac{342000}{12} = 28500$
 \therefore Akruti's monthly income = $\frac{28500}{95} \times 116 = 34800$
 Akruti's annual income = 417600.

24. (b) Time taken by the truck = $\frac{256}{32} = 8$ hr.
Distance covered by the car = $(256 + 160) = 416$ km.
Time = 8 hr.

$$\therefore \text{Speed of the car} = \frac{416}{8} = 52 \text{ km/hr.}$$

25. (a) Required percentage = $\frac{663 - 612}{1020} \times 100 = 5\%$.

26. (c) Area of customer transaction room = $23\text{m} \times 29\text{m} = 667$ sq.m
Area of branch manager room = $13\text{m} \times 17\text{m} = 221$ sq. m
Area of Pantry room = $14\text{m} \times 13\text{m} = 182$ sq. m
Area of Server room = $21\text{m} \times 13\text{m} = 273$ sq. m
Area of locker room = $29\text{m} \times 21\text{m} = 609$ sq. m
Total cost of wooden flooring = ₹ $[(170 \times (667 + 221))$
= ₹ (888×170)
Total cost of marble flooring
= ₹ $[(190 \times (182 + 273 + 609))] = ₹ (190 \times 1064)$
Required Ratio = $888 \times 170 : 1064 \times 190 = 1887 : 2527$

27. (c) Area of 4 walls and ceiling of branch managers room
= $2(lh + bh) + lb = 2[17 \times 12 + 13 \times 12] + 13 \times 17$
= 941 sq. m

$$\text{Total cost of renovatin} = ₹ 190 \times 941 = ₹ 178790$$

28. (e) Total area of bank is 2000 sq. m
Total area of bank to be renovated = 1952 sq. m
Remaining Area = $2000 - 1952 = 48$ sq. m
Total cost Remaining Area to be carpeted at the rate of ₹ 110/sq. meter = ₹ $(48 \times 110) = ₹ 5280$

29. (b) percentage area of bank not to be renovated
 $\Rightarrow \frac{\text{Area bank not be renovated}}{\text{Total area of bank}} \times 100 = \frac{48}{2000} \times 100 = 2.4\%$

30. (a) Total cost of hall of customer transaction
= ₹ $(170 \times 667) = ₹ 113,390$
Total cost of Locker area = ₹ $(190 \times 609) = ₹ 115,710$
Total cost of customer transaction hall + locker area
= ₹ $(113390 + 115710) = ₹ 229,100$

31. (b) $8 \times 6.5 = 52$
 $52 \times 5.5 = \boxed{286}$
 $286 \times 4.5 = 1287$.

32. (d) $3 \times 14 = 42$
 $42 \times 12 = 504$
 $504 \times 10 = \boxed{5040}$
 $5040 \times 8 = 40320$.

33. (c) $403 - 3 = 400$
 $400 - 6 = 394$
 $394 - 12 = 382$
 $382 - 24 = 358$
 $358 - 48 = 310$
 $310 - 96 = \boxed{214}$.

34. (d)
$$\begin{array}{cccccccc} & & +5 & & -9 & & & \\ & & \overbrace{\quad\quad} & & \overbrace{\quad\quad} & & & \\ 7 & 8 & 4 & 13 & -3 & 22 & -14 & \\ & & \underbrace{\quad\quad} & & \underbrace{\quad\quad} & & \underbrace{\quad\quad} & \\ & & -3 & & -7 & & -11 & \end{array}$$

35. (a) $250000 \div 4 = 62500$
 $62500 \div 5 = 12500$
 $12500 \div 4 = 3125$
 $3125 \div 5 = 625$
 $625 \div 4 = \boxed{156.25}$
 $156.25 \div 5 = 31.25$.

Sol. (36-40) :

From the given information, following table can be build:

	Japanese	Hindi	English	French
R1	yes	yes	no	no
R2	yes	no	yes	no
R3	no	yes	yes	no
R4	yes	no	no	yes
R5	no	yes	yes	yes

36. (d) To converse with R4, the other person should be acquainted with at least one common language with R4. R1 and R2 both know Japanese, so option (d) is the best answer to this question.

37. (d) Pairs in three answer options, that is option 1, 2 and 3 have a common language. R3 and R4 don't have any common language, therefore option (d) is the correct answer.

38. (b) If you see the table, we can see French is only known to two people and the other languages are known to three people.

39. (d) There is no common language between R3 and R4. So they need a person who is expert in at least one common language between them. This work can be done by R1, R2, R5 so the best answer to this is option (d).

40. (b) From the table, we see that R1, R2, R3, R4, R5 know either Hindi or Japanese. A new expert should know these two languages to converse with all the old members.

41. (d) Checking option (a)
 $\text{KISS/RAPP} = \{11 \times 9 \times (-8) \times (8)\} / \{(-9)(1) \times (-11) \times (-11)\}$
 $= -6336 / -1089 = 5.818181..$

It does not give a whole number similarly, we can check other options.

Checking option (b)

$$\text{HIS/HELL} = \{8 \times 9 \times (-8)\} / \{8 \times 5 \times 144\} = -576 / 5760 = -1/10$$

Checking option (c)

$$\text{HIS/YOUR} = \{8 \times 9 \times (-64)\} / \{(-2) \times (-12) \times (-6) \times (-9)\}$$

This is also a negative and in fractions.

$$\text{KISS/HELL} = \{11 \times 9 \times (-8) \times (-8)\} / \{8 \times 5 \times 144\} = 11/20 = 0.55$$

This is also in fraction so there is no whole number among the four options.

So option (e) is the right answer

42. (a) $\text{PREM} = (-11) \times (-9) \times (5) \times (13) = 6435$

$$\text{SHAN} = (-8) \times (8) \times 1 \times (-13) = 832$$

$$\text{RAMU} = (-9) \times 1 \times 13 \times (-16) = 702$$

$$\text{RHAN} = (-9) \times (8) \times (1) \times (-13) = 936$$

43. (a) $\text{GS-TSZ} = (7 \times -8) - (-7 \times -8 \times -1) = -56 - (-56) = 0$

Sol. (44-48) :

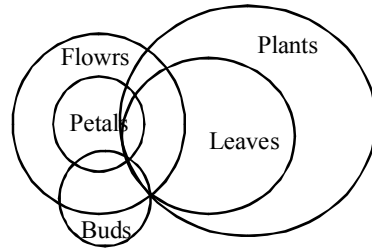
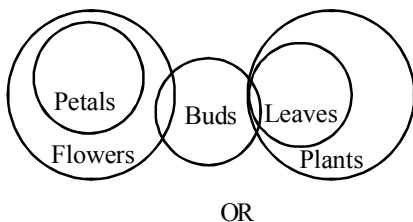
From the above information, we can make a table for this

- From 7, the football player lives in the second flat and he is a design engineer
- From 6 and 2, the chess player and cricketer lives in the third flat
- From 7, Amit is a chess player and a power engineer
- From 6, Tarun is Quality Inspector
- As both the cricketers are left (and we have not decided their professions), according to statement three, they both are Mechanical Engineers
- From 6, Manu and Ambrish are cricketers (regional and national respectively)
- Lastly, one name of Football player and one game name which is played by Tarun is left. From the information above, the football player's name has to be Rohit and tennis is played by Tarun (these were the only pieces of information missing).

Game	Profession	Name	Flat number
Tennis	Quality Inspector	Tarun	5
Cricketer (National)	Mechanical Engg	Ambrish	4
Chess	Power Engg.	Amit	3
Cricket (regional)	Mechanical Engg.	Manu	3
Football	Design Engg.	Rohit	2

Solutions (49-51):

- lop eop aop fop - Traders are above laws → (i)
 fop cop bop gop - Developers were above profitable → (ii)
 aop bop uop qop - Developers stopped following traders → (iii)
 cop job cop uop - Following maps were laws → (iv)
 From (i) and (ii), fop - above
 From (i) and (iii), aop - traders
 From (ii) and (iii), bop - developers
 From (ii) and (iv), cop - were
 From (iii) and (iv), uop - following
 From (i) and (iv), eop - laws
 Therefore, remaining codes are
 lop - are [from (i)]
 gop - profitable [from (ii)]
 qop - stopped [from (iii)]
 jop - maps [from (iv)]
- (b) Developers are following laws = bop lop uop eop = lop bop eop uop
 - (a) qop gop cop eop = Stopped profitable were laws = profitable laws were stopped.
 - (b) aop qop bop = traders stopped developers.
 - (b) According to question,

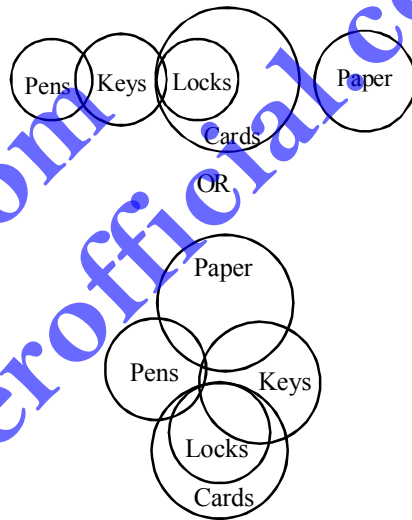


Conclusions I. false

II. false }
 III. false } or

Hence, only either II or III follows.

53. (d) According to question



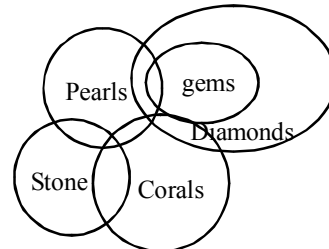
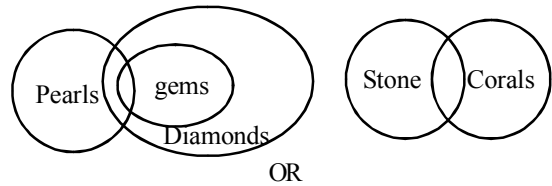
Conclusions I. True

II. True

III. True

Hence, All conclusions follow.

54. (e) According to question,



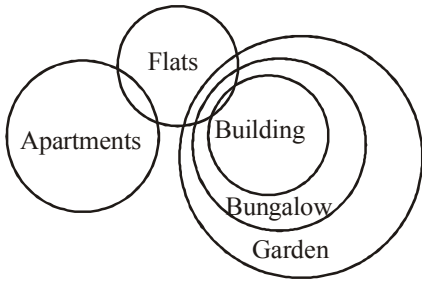
I. False

Conclusion II. True } or

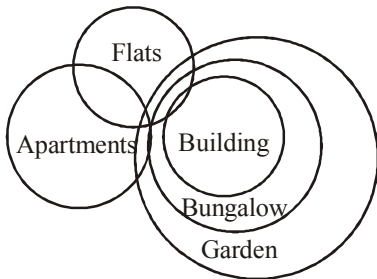
III. False }

Hence, only conclusions II and either I or III follow.

55. (a) According to question,

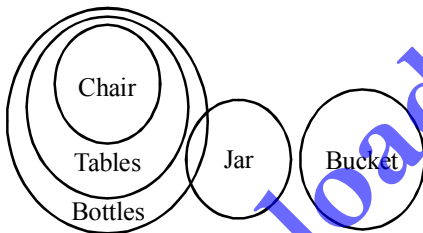


Or

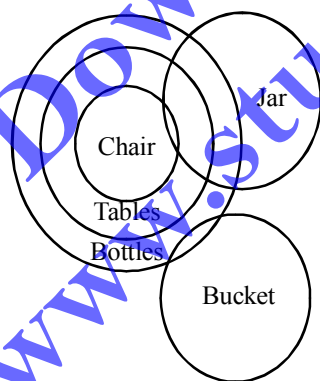


Conclusions I. True, II. False, III. False
Hence, only conclusion I follows.

56. (c) According to question,



OR



Conclusions, I. True, II. True, III. True.
Hence, All I, II and III follow.

Solutions. (Q. No. 57 to 61)

★ ⇒ <	# ⇒ >	@ ⇒ ≥
% ⇒ ≤	\$ ⇒ =	

57. (a) $V \S Y \Rightarrow V = Y$

$Y @ Z \Rightarrow Y \geq Z$

$Z \% X \Rightarrow Z \leq X$

$X \# T \Rightarrow X > T$

From all above statements,

$V = Y \geq Z \leq X > T$

Conclusions I. $T \# Z \Rightarrow T > Z$ (False)

II. $X \# Y \Rightarrow X > Y$ (False)

III. $Z \star Y \Rightarrow Z < Y$ (False)

None follows.

58. (a) $R @ J \Rightarrow R \geq J$

$J \% F \Rightarrow J \leq F$

$F \star E \Rightarrow F < M$

$E \% M \Rightarrow E \leq M$

From all above statements, $R \geq J \leq F < E \leq M$

Conclusions I: $M \# J \Rightarrow M > J$ (True)

II. $F \% M \Rightarrow F \leq M$ (False)

III. $M \star R \Rightarrow M < R$ (False)

Only (I) follows.

59. (b) $H \# R \Rightarrow H > R$

$R @ L \Rightarrow R \geq L$

$L \star W \Rightarrow L < W$

$W \% F \Rightarrow W \leq F$

From all above statements, $H > R \geq L < W \leq F$

Conclusions I. $H \# L \Rightarrow H > L$ (True)

II. $F \# L \Rightarrow F > L$ (True)

III. $H \$ F \Rightarrow H = F$ (False)

60. (e) $M \# J \Rightarrow M > J$

$M \$ F \Rightarrow M = K$

$F \% Q \Rightarrow F \leq Q$

$Q \star H \Rightarrow Q < H$

From all above statements,

$K < M = F \leq Q < H$

Conclusions. I. $H \# K \Rightarrow H > K$ (True)

II. $Q \# K \Rightarrow Q > K$ (True)

III. $Q @ M \Rightarrow Q \geq M$ (True)

So, all follow.

61. (e) $D \star Q \Rightarrow D < Q$

$Q \$ L \Rightarrow Q = L$

$L \# T \Rightarrow L > T$

$T \% H \Rightarrow T \leq H$

From all above statements,

$D < Q = L > T \leq H$

Conclusions. I. $D \star L \Rightarrow D < L$ (True)

II. $L @ H \Rightarrow L \geq H$ (False)

III. $H \# L \Rightarrow H > L$ (False)

Only (I) and either (II) or (III) follow.

62. (e) From statements (I) and (II)

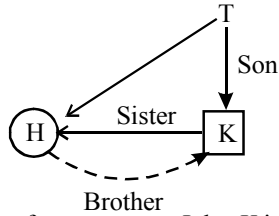
According to weight, the position of Sahil is 5th.

According to weight, the position of Ramesh is 5th.

So, the number of children in group = $5 + 15 = 20$

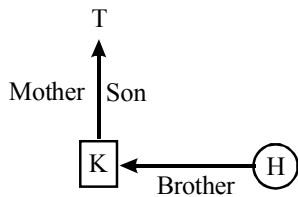
So, both statements are required to given the answer.

63. (d) From statement I,
eat healthy food → Ka ma re
From statement II.
food for healthy people → ta ma jo re
So, from both statements, code of 'healthy' can not be determined exactly but it may be 'ma' or 're'.
64. (c) From statement I,



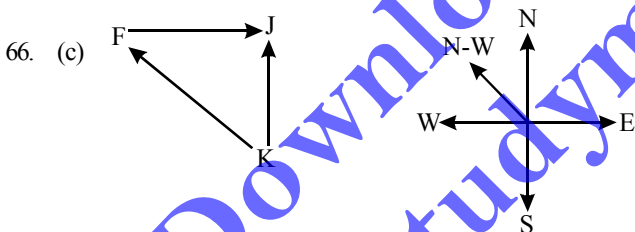
So, it is clear from statement I that K is the only brother of H.

From Statement II.



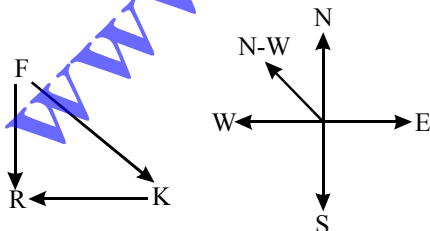
So, from statement (II), K is the only brother of H. So, either I or II is sufficient.

65. (a) From statement (I). $W > J > (Q, R, T)$
So, W reached office first.
From statement (II), $(J, T) > W > Q > R$
It is not clear from statement (II) that who reached the office first either J or T.
So, for giving the answer. Statement I is sufficient but statement II is not sufficient.



From statement I, village F is in North-West direction of village K.

From statement II,



From statement II, village F is in North-West direction of village K.

So, either I or II is sufficient to answer the question.

Sol. (67-70)

	Mridul	Abhishek	Ranjan	Salil	Deepak	Pritam
Place	Chennai	Ahmedabad	Delhi	Bengaluru	Kolkata	Mumbai
Month	November	July	April	September	February	December
Brides	Ipsita	Veena	Hema	Jasmine	Geetika	Brinda

67. (c) Ranjan is Hema's Husband.
68. (c) Deepak's wedding took place in Kolkata.
69. (d) It's in the month of December.
70. (a) Salil's wedding was held in Bengaluru.
71. (b) Refer to the 1st sentence of para 1 'Govind's father left large tract of land to Govind'.
72. (c) Refer to the 3rd sentence of para 2 "To his surprise.....into gold".
73. (d) Refer to the last two sentences of para 1 of the passage.
75. (e) Refer to the sixth sentence of para 2 of the passage 'You have.....during winter'.
76. (b) Refer to the third last sentence of para 3 of the passage.
77. (c) Refer to the ninth sentence 'She would take.....a good price' of the para 3 of the passage.
78. (a) Refer to the third last sentence 'people took.....cheated him' of the para 1 of the passage.
79. (c) The word **spend** (verb) means to pay out, to employ (labour, time etc.) on some objects. For instance, How do you spend your leissure-time?
Similarly, the word **devote** (verb) means to give time and energy to something. For instance, He is devoted to his studies.
Thus, spend and devote are synonymous.
80. (d) The word **lie** (verb) means be at rest. For instance, She is lying on the bed.
Similarly, the word **remain** (verb) means continue to stay. For instance, Twenty pens were distributed and the remaining were returned.
Thus, lying and remaining are synonymous.
81. (a) The word **dismay** (noun) means feeling of fear and discouragement. For instance, They were struck with dismay at the news.
While, the word **joy** (noun) means feeling of happiness. Thus, both are antonymous.
82. (d) The word **tend** (verb) means look after. For instance, Nurse tended the injured persons.
While, the word **ignore** (verb) means take no notice of. For instance, Raman ignored the advice of his elders.
Thus, both are antonyms.
87. (d) Use 'divided' instead of 'dividend'.
88. (a) Use 'agreed' properly for 'consented'.
89. (b) Use 'file' instead of 'fill'.
90. (c) Apply 'funds' for 'investment'.

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