CONTAINS 2500 MCQS

50 PRACTICE SETS

REASONING

(Verbal, Non-Verbal & Analytical Reasoning)

arihant

HIGHLY USEFUL FOR

SSC (CGL, CPO, 10+2 & Multitasking), IBPS (PO & Clerk), LIC (ADO & AAO), Railway and Other Competitive Exams

CONTAINS 2500 MCQS

50 PRACTICE SETS

REASONING

(Verbal, Non-Verbal & Analytical Reasoning)

HIGHLY USEFUL FOR

SSC (CGL, CPO, 10+2 & Multitasking), IBPS (PO & Clerk), LIC (ADO & AAO), Railway and Other Competitive Exams

ARIHANT PUBLICATIONS (INDIA) LTD

ARIHANT PUBLICATIONS (INDIA) LTD

Administrative & Production Offices

Regd. Office 'Ramchhaya' 4577/15, Agarwal Road, Darya Ganj, New Delhi -110002
Tele: 011- 47630600, 43518550; Fax: 011- 23280316

Head Office Kalindi, TP Nagar, Meerut (UP) - 250002
Tel: 0121-2401479, 2512970, 4004199; Fax: 0121-2401648

Sales & Support Offices

Agra, Ahmedabad, Bengaluru, Bhubaneswar, Bareilly, Chennai, Delhi, Guwahati, Haldwani, Hyderabad, Jaipur, Jhansi, Kolkata, Kota, Lucknow, Meerut, Nagpur & Pune

ISBN 978-93-5094-473-8

Price ₹ 245.00

Typeset by Arihant DTP Unit at Meerut

Printed & Bound by Arihant Publications (I) Ltd. (Press Unit)

For further information about the products from Arihant,
log on to www.arihantbooks.com or email to info@arihantbooks.com

PREFACE

Reasoning is the most important part of any competitive examination. It basically tests candidates's thinking power and mind applicability skills. The questions that are asked in different examination are not easy to solve without having a good practice. This section covers questions from various topics of Verbal Reasoning, Non-Verbal Reasoning and Analytical Reasoning.

This book 50 Practice Sets on Reasoning is highly useful for all Competitive Examinations viz. SSC (CGL, CPO, 10+2 and Multitasking), Bank (PO and Clerk), LIC (AAO and ADO), Railway and other Competitive Examinations.

This book 50 Practice Sets is a collection 2500 Multiple Choice Questions covering all the concepts and all types of questions according to latest pattern of Examination.

Detailed explanations with answers has been given at the end of each practic set.

As we know *'Practice is the only key to Success'*, after practicing this book you will get higher score and 100% success in the Examination.

Authors

CONTENTS

REASONING : AT A GLANCE

VERBAL REASONING

Verbal reasoning is understanding and reasoning using concepts framed in words.

It aims at evaluating the ability to think correctly and constructively, rather than at simple fluency or vocabulary power. It is also a test of intelligence, provides an assessment of individual's ability to think logically and solve problems in shortest of time. Verbal Reasoning Test use words, letters and numbers and require logical reasoning and a reasonable knowledge of English language words.

Verbal reasoning involves following topics

1. Analogy
2. Classification
3. Series
4. Coding-Decoding
5. Direction and Distance
6. Sitting arrangement
7. Ranking etc.

Analogy

Analogy means 'similar' or 'correspondance'. It can be described as the logical similarity between two or more groups of numbers/letters/words/ alpha-numerics.

Analogy can be divided into following types :

1. Word Analogy

In this type, candidate has to find the relationship between given words in a pair.

Example 1. 'Smell' is related to 'Flower', in the same way 'Taste' is related to

(a) Tongue (b) Food (c) Water (d) Sweet

Sol. (b) As, 'Smell' comes from 'Flower', in the same way, 'Taste' comes from 'Food'.

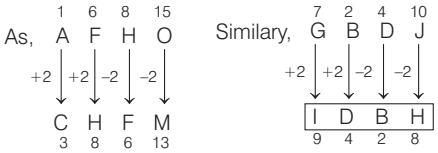
2. Letter Analogy

In this type, the candidate has to find out the relationship between the given letters or group of letters in a pair.

Example 2. AFHO : GBDJ : : CHFM : ?

(a) GBIM (b) IDBH (c) GBLD (d) GPLD

Sol. (b)



3. Number Analogy

In this type, numbers are given in a pair or group and the candidate has to find the relationship between the numbers or group numbers.

Example 3. 10 : 100 : : ? : 121

(a) 10 (b) 11

(c) 12 (d) 13

Sol. (b) Square of first term is the second term.

As, $10^2 = 100$

So, $11^2 = 121$

4. Alpha-Numeric Analogy

In this type, there is a certain relationship between the given group of letters and a number on one side and candidate is asked to find out the correct alternative based on the relationship.

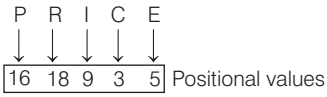
Example 4. NICE : 14935 : : PRICE : ?

(a) 1618935 (b) 1817359

(c) 1618953 (d) 1719539

Sol. (a) As,

Similarly,



Classification

Classification means finding an odd term from a given set of terms.

In classification the candidates are required to find out the term which is different from others. It is also known as 'Odd One Out'.

Classification can be divided into following types :

1. Word Classification

In this type, a set of words having a common property is given and the word having different property from the rest is to be identified.

Example 1. Choose the word which is different from others.

(a) Brick (b) Heart
(c) Diamond (d) Spade

Sol. (a) Except brick, all others are suits of cards.

2. Letter Classification

In this type, a set of letters (letters' group) having some common property is given and the letter (letters' group) which is different from the rest is to be identified.

Example 2. Choose the group of letters which is different from others.

(a) AC (b) FH
(c) IJ (d) PR

Sol. (c) As,

So, IJ is odd one out.

3. Number Classification

In this type, a set of numbers having some common property is given. The numbers can be such that all except one are of the same kind, such as odd numbers, prime numbers, squares/cubes, etc. The number which is different from the rest of numbers is to be identified.

Example 3. Choose the number which is different from others.

(a) 124 (b) 235
(c) 789 (d) 510

Sol. (d) All the above numbers have digits in ascending order but in option (d), it is in descending order. So, 510 is odd one.

Series

Series means finding the next term in a given arrangement of letters, numbers or combination of both. The candidate is required to study the given series, identify the pattern followed in the series and then complete the given series with the most suitable alternative or find the wrong term in the series.

Series can be divided into following types:

1. Number Series

In this type, various numbers are arranged in an order by following certain mathematical rules based on +, –, ×, ÷ or a combination of these, square root/cube root, odd/even numbers etc.

The questions are asked in two formats :

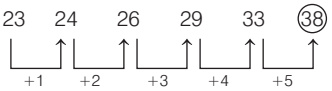
(a) Find the Missing Term

Example 1. Find the next term for the given series.

23, 24, 26, 29, 33, ?

(a) 34 (b) 37 (c) 38 (d) 39

Sol. (c) The pattern of the series is as follows



So, the next term is 38.

(b) Find the Wrong Term

Example 2. Find the wrong term in the given series.

7, 9, 16, 25, 41, 68, 107

(a) 107 (b) 16 (c) 41 (d) 68

Sol. (d) As, $7 + 9 = 16$, $9 + 16 = 25$,

$16 + 25 = 41$, $25 + 41 = 66 \neq 68$ and

$41 + 66 = 107$

So, in the series 68 is wrong as $25 + 41 = 66 \neq 68$.

2. Letter Series

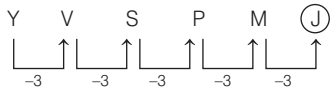
In this type, the letters of the English alphabet are arranged in a certain order by following some rule like their positions in the alphabet, reverse order of letters, skipping of letters etc.

Example 3. Find the next term for the given series.

Y, V, S, P, M, ?

(a) I (b) K (c) J (d) H

Sol. (c) The pattern of the series is as follows



So, the next term will be J.

3. Alpha-Numeric Series

In this type, the pattern of series is based on the combination of both numbers and letters.

Example 4. What comes in place of question mark (?) in the series given below?

P3C, R5F, T8I, V12L, ?

(a) Y17O (b) X16M
(c) X17O (d) X16O

Sol. (c) The pattern of the series is as follows

$$P \xrightarrow{+2} R \xrightarrow{+2} T \xrightarrow{+2} V \xrightarrow{+2} X$$
$$3 \xrightarrow{+2} 5 \xrightarrow{+3} 8 \xrightarrow{+4} 12 \xrightarrow{+5} 17$$
$$C \xrightarrow{+3} F \xrightarrow{+3} I \xrightarrow{+3} L \xrightarrow{+3} O$$

So, the next term be X17O.

4. Continuous Pattern Series

This type of series consists of a series of capital/small letters that follow a certain pattern like repetition of letters.

Example 5. Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?

g _ _ g _ _ gh _ g _ i

(a) h i h i i h (b) h h i i h h (c) j k l j k l (d) h i j k l i

Sol. (a) ghi/ghi/ghi/ghi

⇒ h i h i i h

Alphabet and Number Sequence Test

Alphabet and Number Sequence Test are based on arrangement of English letters and numbers in a certain defined pattern. There are two types of questions covered in this chapter as follow :

1. Alphabet Test

In this type, we deal with the questions which are based on finding the place of an English letter to the left or right of another English letter in the alphabetical order, finding the number of English letter(s) between two different English letters, letters in forward/reverse order, etc.

Example 1. In the English alphabet, find the position of S from right.

(a) 8 (b) 5 (c) 4 (d) 9

Sol. (a) Position of S from left = 19

∴ Position of S from right = 27 – 19 = 8

Example 2. How many such letters are there in the word 'CATEGORY' each of which is as far away from the beginning of the word as when they are arranged in alphabetical order?

(a) None (b) One
(c) Two (d) Three

Sol. (b) The given word, C A T E G O R Y

Alphabetically, A C E G O R T Y

We find that, only Y maintains its position when the word is arranged in alphabetical order.

Example 3. If each alphabet in the word 'FRACTION' is arranged in alphabetical order and then each vowel is changed to the next letter in the English alphabetical series and each consonant is changed to previous letter in English alphabetical series, which of the following will be 4th from the right side of the new arrangement thus formed?

(a) M (b) T (c) P (d) E

Sol. (a) Original word, F R A C T I O N

I. Change, A C F I N O R T

II. Change, B B E J (M) P Q S

Clearly, M will be fourth from the right.

2. Letter/Number Sequence Test

In this type, a sequence of letters/numbers in which a series of letters/numbers with or without repetitions is given. The candidates are required to find the total number of a particular letter/number in the series applying certain condition or rules.

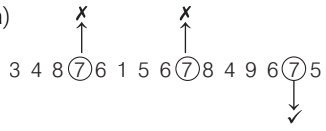
Sometimes, the given sequence also includes symbols along with letters/numbers.

Example 4. How many 7's are there in the given series which are immediately preceded by 6 but not immediately followed by 8?

3 4 8 7 6 1 5 6 7 8 4 9 6 7 5

(a) 1 (b) 2
(c) 3 (d) 4

Sol. (a)



✓ = Condition fulfilled

✗ = Condition not fulfilled

∴ Required 7 = 1 time

Directions (Ex. Nos. 6-7) *Study the following arrangement carefully and answer the questions given below.*

F 4 © T 2 E % M P 5 W 9 @ L Q R 6 U H 3 Z

7 * A T B 8 V # G $ Y D

Example 5. What should come in place of question mark (?) in the following series based on the above arrangement?

TEM 59L RU3 ?

(a) 7AB (b) 7AT

(c) *78 (d) ABV

Sol. (a) F 4 s T 2 E % M P 5 W 9 @ L Q R 6 U H 3 2

7 * A T B 8 V # G $ Y D

So, following the sequence will be 7AB.

Example 6. In the following letter series, how many times do PQR occur in such a way that Q is in the middle of P and R?

QMPNPQRROPQNOPPQRPMQROPQRPPR

RPQRP

(a) 5 (b) 6

(c) 4 (d) 3

Sol. (c) Q M P N P Q R R O P Q N O P P Q R P M Q R O P Q R P P R R P Q R P

So, in the above arrangement, PQR occur 4 times in such a way that Q in the middle of P and R.

Sequencing and Formation of Words

In sequencing of words, we arrange the words in a chronological order according to the occurrence of words in dictionary or in our surroundings. It is a step-by-step completion of a process that exists in the word. Whereas, formation of words means creating meaningful words from the alphabets of given word.

Example 1. Arrange the following words in a logical and meaningful order.

1. Study 2. Earn
3. Job 4. Examination
5. Apply

(a) 2, 3, 4, 5, 1 (b) 1, 4, 5, 2, 3

(c) 2, 3, 5, 1, 4 (d) 1, 4, 5, 3, 2

Sol. (d) Here, the process of an adult person is given from his study to the mode of his earning.

So, it can be arranged as

Study → Examination → Apply → Job → Earn

i.e. 1, 4, 5, 3, 2

Example 2. Arrange the following words as given in dictionary.

1. Horoscope 2. Hockey
3. Heroine 4. Health

(a) 1, 2, 3, 4 (b) 4, 3, 1, 2

(c) 4, 3, 2, 1 (d) 2, 1, 3, 4

Sol. (c) Here, the words are arranged according to dictionary as

Health → Heroine → Hockey → Horoscope

i.e. 4, 3, 2, 1

Example 3. From the given alternatives select the word which cannot be formed using the letters of the given word.

INFLATIONARY

(a) FLAIR (b) FAULTY

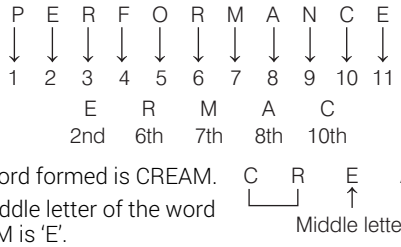
(c) NATIONAL (d) RATION

Sol. (b) Due to absence of letter U, word FAULTY cannot be formed from the word INFLATIONARY.

Example 4. If it is possible to make a meaningful word from the second, sixth, seventh, eighth and tenth letters of the word 'PERFORMANCE' using each letter only once. Middle letter of the word is

(a) C (b) M (c) E (d) R

Sol. (c) In the given word



The word formed is CREAM.

So, middle letter of the word CREAM is 'E'.

Coding-Decoding

Coding means to hide the meaning of any message and decoding means to understand the actual meaning of that message.

In this type of questions, a word is coded in a particular way and the candidates are asked to code other word in same way.

Different types of questions asked from this topic such as :

1. Coding based on rearrangement/ replacement of letters
2. Opposite letter coding
3. Number coding/Symbol coding
4. Coding by substitution/word replacement
5. Fictitious language coding
6. Conditional coding
7. Matrix coding

Example 1. In a certain code, ABROAD is written as RBADAO, then how will SACHET be written in that code?

(a) HETSAC (b) TEHCAS (c) STAECH (d) CASTEH

Sol. (d) Here, the coded word has been obtained by interchanging the positions of first and third letters and fourth and sixth letters with each other.

As, A B R O A D → R B A D A O

Similarly, S A C H E T → C A S T E H

So, the code for SACHET will be CASTEH.

Example 2. In a certain coded language, GONE is coded as '5 % 2 #' and MEDAL is written as '4 # 3 $ @'. How is ENAMEL written in that code?

(a) # 2 $ 4 % @ (b) # 2 $ 3 # @
(c) # 2 $ 4 # @ (d) $ 2 # 4 $ @

Sol. (c) Given codes

G O N E → 5 % 2 # and M E D A L → 4 # 3 $ @

Similarly, from the corresponding symbols of above alphabets, we get

E N A M E L → # 2 $ 4 # @

Example 3. If 'water' is known as 'food', 'food' as 'tree', 'tree' as 'sky', 'sky' as 'well' and 'well' as 'pond', then which of the following would yield (produce) fruits?

(a) Sky (b) Food
(c) Well (d) Tree

Sol. (a) As we all know that, tree yields fruits and according to code tree is called sky. So, sky yields fruits.

Example 4. In a certain code language, 'ha sa ka' means 'you are reading', 'na sa pa' means 'they are walking' and 'ka ma pa' means 'reading and walking'. Which word in that language means reading?

(a) ka (b) ha
(c) ma (d) na

Sol. (a) Here, the codes can be written as

ha (sa) [ka] → you (are) [reading] ...(i)

na (sa) /pa/ → they (are) /walking/ ...(ii)

[ka] ma /pa/ → [reading] and /walking/ ...(iii)

On comparing Eqs. (i) and (iii), we get

ka ⇒ reading

So, the code for reading is ka.

Example 5. A word is represented by only one set of numbers as given in anyone of the alternatives. The set of numbers given in the alternatives are represented by two classes of alphabets as in the two matrices given below. The columns and rows of Matrix I are from 0 to 4 and that of Matrix II from 5 to 9. A letter can be represented first by its row and next by its column number. e.g. 'C' can be represented by 02, 21 etc. 'T' can be represented by 65, 96 etc. Similarly, you have to identify the correct set for the word given in question.

Matrix I

	0	1	2	3	4
0	D	V	C	P	M
1	P	M	D	V	C
2	V	C	P	M	D
3	M	D	V	C	P
4	C	P	M	D	V

Matrix II

	5	6	7	8	9
5	S	A	U	T	J
6	T	J	S	A	U
7	A	U	T	J	S
8	J	S	A	U	T
9	U	T	J	S	A

PAST

(a) 10, 56, 41, 58 (b) 22, 68, 55, 66

(c) 34, 75, 67, 58 (d) 41, 99, 98, 88

Sol. (c) According to the matrices,

P - 03, 10, 22, (34), 41

A - 56, 68, (75), 87, 99

S - 55, (67), 79, 86, 98

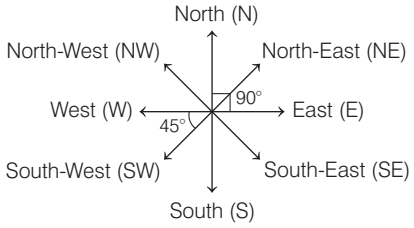
T - (58), 65, 77, 89, 96

$\therefore$ PAST $\Rightarrow$ 34, 75, 67, 58

Direction and Distance

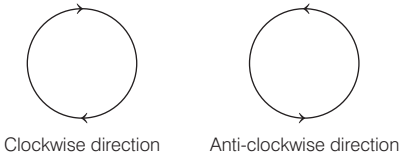
Direction can be defined as the measurement of an object's or person's position with respect to another object or person and displacement is the measurement of distance between the starting point and final point.

The diagram given below shows the four main directions and the four cardinal (sub-directions) directions.



(Main directions - E, W, N, S and cardinal directions-NE, NW, SE, SW)

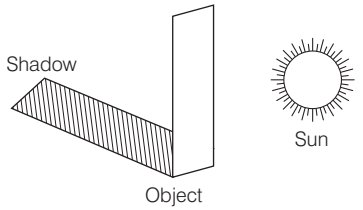
There are two cyclic directions namely clockwise and anti-clockwise. The direction in which the hands of a clock move is called clockwise direction while its opposite direction is called anti-clockwise direction as shown below



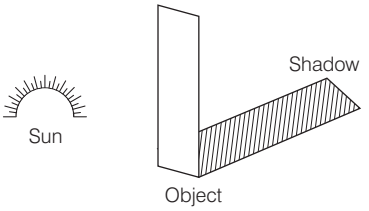
Concept of Shadow

In the morning, when the Sun rises in the East, the shadow of any person or object is in the West direction. Similarly, in the evening, when the Sun sets in the West, the shadow of a person or an object is towards the East.

Shadow at the time of Sunrise



Shadow at the time of Sunset

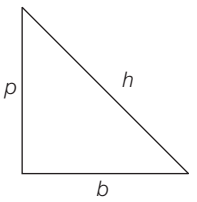


Note At 12:00 noon, there will be no shadow as the rays of the Sun are vertically downwards at that time.

In order to determine the shortest distance between the two given points, the Pythagoras formula,

$$h^2 = b^2 + p^2$$

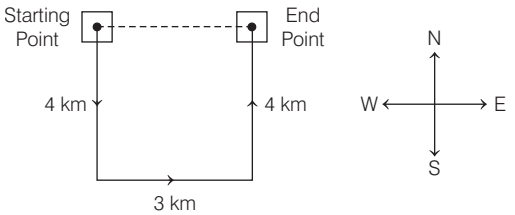
Here, h = Hypotenuse, b = Base and p = Perpendicular



Example 1. Sakshat drives 4 km to the South, then turns left and drives 3 km. Again, he turns left and drives 4 km. In which direction is he from the starting point?

(a) North (b) East (c) South (d) West

Sol. (b) The direction diagram of sakshat is as follows:

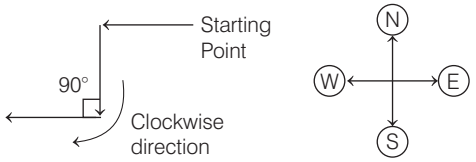


Now, comparing the above direction graph with the standard direction graph, we see that Sakshat is in East direction from his starting point.

Example 2. A girl was going towards West, then she turned left, then turned 90° in clockwise direction. In which direction was she going now?

(a) East (b) West
(c) North (d) South

Sol. (b) The direction diagram of a girl is as follows:

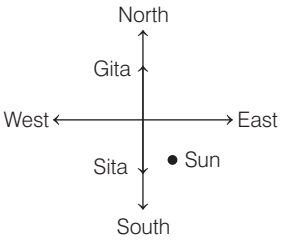


So, the girl was going in West direction.

Example 3. One morning after sunrise, Sita and Gita were standing at a chowk in Mumbai with their back towards each other. Sita's shadow fell exactly towards right hand side. Which direction was Gita facing?

(a) East (b) West (c) North (d) South

Sol. (c) The direction diagram of Sita and Gita is as follows :

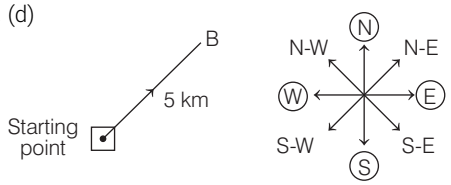


So, Gita was facing in North direction.

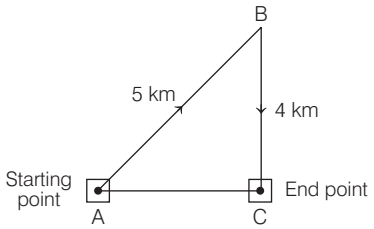
Example 4. Ridhan goes 5km towards North-East and then he goes 4 km towards South. How far is he now from his starting point?

(a) 8 km (b) 2 km (c) 6 km (d) 3 km

Sol. (d)



Then, he goes 4 km towards South.



From the above direction graph, total distance from starting point to the ending point = AC

Using Pythagoras theorem, $AB^2 = BC^2 + AC^2$

$\Rightarrow \quad 5^2 = 4^2 + AC^2$

$\Rightarrow \quad 25 - 16 = AC^2$

$\therefore \quad AC = 3\,km$

Ranking

Ranking means arranging a set of objects/ persons from top to bottom or bottom to top and from left to right or right to left, as per the given relation between them. In this chapter, the problems are related to the arrangement of the persons/objects in ascending/descending order (based on different parameters like age, salary, height, etc) and determining the position of a person/object in a row/queue.

The Ranking test follows three formulae

(i) Rank of a person/object from lower or right end = (Total number of persons/objects in row) – (Rank of that person/object from upper or left end) + 1

(ii) Rank of person/object from upper or left end = (Total number of persons/objects in row) – (Rank of that person/object from lower or right end) + 1

(iii) Total number of persons/objects in a row or class = (Rank of a person/object from upper or left end) + (Rank of that person/object from lower or right end) – 1

Example 1. In a list, Shikha is 15th from the upper end and 17th from the lower end, then find the total number of people in the list.

(a) 41 (b) 33 (c) 31 (d) 32

Sol. (c) Clearly, using formula,

Total number of people in a row or class = (Rank of a person from upper end) + (Rank of that person from lower end) – 1 Total number of people in the list

$\Rightarrow 15 + 17 - 1 \Rightarrow 32 - 1 \Rightarrow 31$

Example 2. Priti scored more than Rahul. Yamuna scored as much as Divya. Lokita scored less than Manju. Rahul scored more than Yamuna. Manju scored less than Divya. Who scored the lowest?

(a) Manju (b) Yamuna (c) Lokita (d) Rahul

Sol. (c) According to the given information, the arrangement is shown below

Priti	>	Rahul
Yamuna	=	Divya
Manju	>	Lokita
Rahul	>	Yamuna
Divya	>	Manju

So, the final order is as follows

Priti > Rahul > Yamuna = Divya > Manju > Lokita

Hence, Lokita got the lowest score.

Puzzles

In Puzzles, we deal with the questions, in which the information is given in a confusing manner or regarding arrangement. The candidates are required to proceed systematically by interrelating all the given information in order to arrive at the correct answer.

The questions are based on following types :

1. Classification Type Questions
2. Seating/Placing Arrangements
3. Conditions, Grouping and Team Formation
4. Sequential Order of Things
5. Family Based Problems

Example 1. Shaan and Kunal are good in cricket and football. Sonu and Shaan are good in cricket and hockey. Abhishek is good in hockey. Who is good in all the three games?

(a) Shaan (b) Kunal
(c) Sonu (d) Abhishek

Sol. (a) Information given in the question can be arranged as

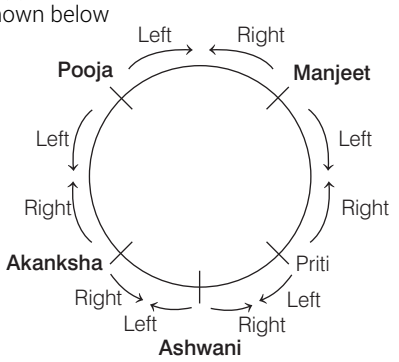
	Cricket	Football	Hockey
Shaan	✓	✓	✓
Kunal	✓	✓	
Sonu	✓		✓
Abhishek			✓

It is clear from the above table that, Shaan is good in all the three games.

Example 2. Five persons are sitting facing the centre of a circle. Priti is sitting to the right of Ashwani. Pooja is sitting between Akanksha and Manjeet. Pooja is to the left of Akanksha and Ashwani is to the right of Akanksha. Who is sitting to the left of Manjeet?

(a) Priti (b) Pooja
(c) Akanksha (d) Ashwani

Sol. (a) The given information can be represented as shown below



Clearly, Priti is sitting to the left of Manjeet.

Direction No. 3 *Read the passage given below and answer the question that follows.*

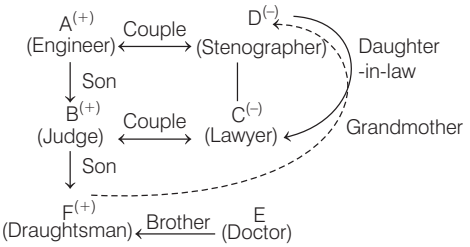
A, B, C, D, E and F are members of a family. They are engineer, stenographer, doctor, draughtsman, lawyer and judge (not in order). A, the engineer, is married to the lady stenographer.

The judge is married to the lawyer. F, the draughtsman, is the son of B and brother of E. C, the lawyer, is the daughter-in-law of D. E is the unmarried doctor. D is the grandmother of F. There are two married couples in the family.

Which of the following is/are a couple/couples?

(a) Only AD (b) Only BC
(c) AD and BC (d) AC and BD

Sol. (c) From the given information, the relation chart can be drawn as



From the above diagram, the married couples are AD and BC.

Inserting the Missing Character

Inserting the missing character is based on diagrammatic arrangement of letters/numbers or combination of both in which a missing term is asked to be calculated.

Directions (Ex. Nos. 1-3) *Select the missing character from the given responses.*

Example 1.

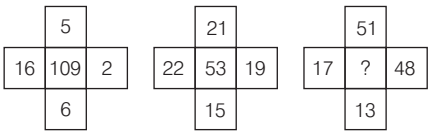
63	7	9
30	5	6
20	4	?

(a) 8 (b) 3
(c) 5 (d) 2

Sol. (c) As, $7 \times 9 = 63$ and $5 \times 6 = 30$
Similarly, $4 \times ? = 20$

$$? = \frac{20}{4} = \boxed{5}$$

Example 2.



(a) 7 (b) 25 (c) 49 (d) 129

Sol. (b) The pattern is

$$(16 - 6)^2 + (5 - 2)^2 = 10^2 + 3^2 = 109$$

and $(22 - 15)^2 + (21 - 19)^2 = 7^2 + 2^2 = 53$

So, the missing number $= (17 - 13)^2 + (51 - 48)^2$
$= 4^2 + 3^2 = 25$

Example 3.

R	Q	L
S	P	M
T	?	N

(a) O (b) R (c) W (d) V

Sol. (a) According to English alphabet, moving columnwise

$$R \xrightarrow{+1} S \xrightarrow{+1} T$$
$$Q \xrightarrow{-1} P \xrightarrow{+1} \boxed{O}$$
$$L \xrightarrow{+1} M \xrightarrow{+1} N$$

So, the missing character is O.

Problems Based on Ages

Problems based on ages mainly deals with the concept of relative age, i.e. age of a person at two different times or age of two persons.

Rules Related to Problems Based on Ages

1. If the present age of A is a yr, then b yr ago, A's age would be $(a - b)$ yr and after c yr will be $(a + c)$ yr.
2. If the age of a person n yr ago was p yr, then after n yr his age will be $(p + n + n)$ yr.
3. If the age of a person after m yr will be p yr, then his age n yr ago was $(p - m - n)$ yr.

Example 1. The ratio of the present ages of Jai and Ajay is 4 : 5. If Ajay is 6 yr elder than Jai, then what was the ratio of their ages 4 yr ago?

(a) 10 : 13 (b) 8 : 9
(c) 14 : 17 (d) 1 : 2

Sol. (a) Let the age of Jai be x yr.
Then, age of Ajay = $(x + 6)$ yr
According to the question,

$$\frac{x}{x + 6} = \frac{4}{5}$$

$$\Rightarrow \quad 5x = 4(x + 6)$$
$$\Rightarrow \quad 5x = 4x + 24$$
$$\Rightarrow \quad x = 24$$

$\therefore$ Age of Ajay 4 yr ago = $(24 + 6) - 4 = 26$ yr
and age of Jai 4 yr ago = $24 - 4 = 20$ yr
Hence, ratio of their ages 4 yr ago
$= 20 : 26 = 10 : 13$

Blood Relation

Blood Relations means any relation between two or more persons which is acquired by them by the virtue of their birth.

Blood relationship is defined as the social relationship among the members of the family. The relationship can be divided into two main categories.

1. Maternal
2. Paternal

Relation on the mother's side are called maternal, while the relations on the father's side are called paternal.

The typical relationship that are commonly used in blood relation problems are summarised as follows:

Mother's or Father's father	Grandfather
Mother's or Father's mother	Grandmother
Grandfather's or Grandmother's father	Great grandfather
Grandfather's or Grandmother's mother	Great grandmother
Grandfather's or Grandmother's only daughter-in-law	Mother
Grandfather's or Grandmother's only son	Father
Mother's or Father's brother	Uncle
Mother's or Father's sister	Aunt
Husband's or Wife's father	Father-in-law
Husband's or Wife's mother	Mother-in-law
Husband's or Wife's sister	Sister-in-law
Husband's or Wife's brother	Brother-in-law
Husband of the daughter	Son-in-law
Wife of the son	Daughter-in-law
Wife of the brother	Sister-in-law
Sister's husband	Brother-in-law
Brother's or Sister's son	Nephew
Brother's or Sister's daughter	Niece
Uncle's or Aunt's son or daughter	Cousin
Children of same parents	Siblings
Children's children	Grandchildren

For differentiating a male and a female, we use (+) symbol for 'male' and (–) symbol for 'female'.

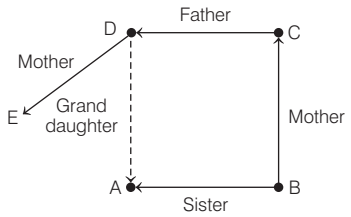
Generally two types of questions asked from this chapter such as :

1. Blood relation based on conversation
2. Symbolically coded blood relationship

Example 1. A is B's sister. C is B's mother. D is C's father. E is D's mother. Then, how is A related to D?

(a) Daughter (b) Granddaughter
(c) Grandmother (d) Grandfather

Sol. (b)

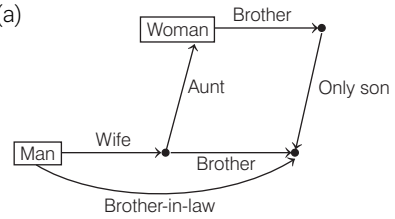


So, A is granddaughter of D.

Example 2. A man said to a woman, "The only son of your brother, is the brother of my wife". How is that woman related to the wife of that man?

(a) Aunt (b) Sister
(c) Mother (d) Grandmother

Sol. (a)



So, that woman is aunt to the wife of that man.

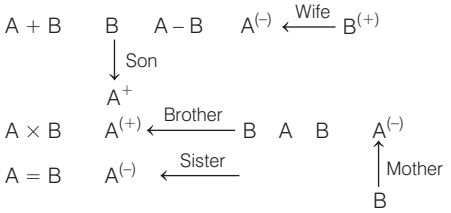
Example 3. Read the following information carefully and answer the question that follows.

(i) 'A + B' means 'A is the son of B'.
(ii) 'A – B' means 'A is the wife of B'.
(iii) 'A × B' means 'A is the brother of B'.
(iv) 'A ÷ B' means 'A is the mother of B'.
(v) 'A = B' means 'A is the sister of B'.

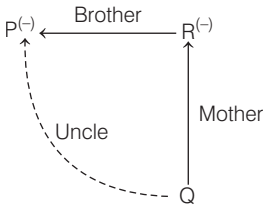
What does 'P × R ÷ Q' mean?

(a) P is the nephew of Q
(b) P is the uncle of Q
(c) P is the brother of Q
(d) P is the niece of Q

Sol. (b) By decoding the given information using symbols of family diagram, we get



By applying above decoding method for the given equation, we get the following family diagram,



From the above family diagram, we get that P is the uncle of Q, since P is the brother of R.