CHAPTER 9

Problem Solving

INTRODUCTION

In this chapter you will see some typical problems in which you would be given a series of interlinked information and on the basis of those informations you would be expected to reach certain conclusions. Such questions are the essential part of certain examinations.

TYPES OF INFORMATIONS IN A GIVEN PROBLEM

1. Basic informations

(Useful secondary informations): It is given in first couple of sentences of given data are such that they give you some basic information that is essential to give you general idea of the situation.

2. Actual informations

Whatever remains after the basic informations are known as actual information.

While trying to solve a problem one should begin with actual information and useful secondary information should be solve by mind.

3. Negative informations

Actual informations having negative sentences are called negative information. A negative information does not inform us anything exactly but it gives a chance to eliminate a possibility.

For example, A is not the brother C.

TYPES OF PROBLEMS

1. Simple problems (based on categorisation)
2. Problems based on arrangement (Linear, circular, rectangular/square).
3. Problems based on comparison.
4. Problems based on blood relations.
5. Blood relations and profession based problems.
6. Problems based on conditional selection.
7. Miscellaneous problems.

Now, we will discuss all the types of problems one by one

1. Simple Problems (Based on Categorisation)

Tips to Solve Problems

These type of problems can easily be solved by construction of table.

EXAMPLE **1. (Qs.1-5): Read the following information carefully and answer the questions that follows:**

1. There are six cities L, M, N, O, P and Q.
2. L is not a hill station
3. M and P are not historical places
4. O is not an industrial city
5. L and O are not historical cities
6. L and M are not alike

1. Which two cities are industrial centers?
(a) L and M (b) P and Q
(c) N and O (d) M and Q
(e) L and O

2. Which two cities are historical places?
(a) L and M (b) M and Q
(c) N and Q (d) M and P
(e) L and O

3. Which two cities are hill stations?
(a) L and M (b) N and L
(c) M and O (d) L and Q
(e) None of these

4. Which city is a hill station and an industrial centre but not a historical place?
(a) P (b) Q
(c) L (d) M
(e) N

5. Which two cities are neither historical place nor industrial centre?
(a) L and M (b) O and P
(c) Q and N (d) M and O
(e) None of these

Ex. 1 (Problem format) is such type of problem and it can be solved by preparing a table in the manner given below.

	L	M	N	O	P	Q
Historical place						
Industrial city						
Hill station						

(2), (3), (4), (5) are negative informations. Therefore as per such informations. We put 'X' (not) mark wherever applicable. As a result the table looks like the one below.

	L	M	N	O	P	Q
Historical place	×	×		×	×	
Industrial city				×		
Hill station	×					

As above table gives definite informations about L, O. L is neither a historical place nor a hill station. So, it must be an industrial city. In the same manner O is neither a historical nor an industrial city. So, O must be a hill station. Hence, we put '✓' mark at the appropriate place which give the table following look:-

	L	M	N	O	P	Q
Historical place	×	×		×	×	
Industrial city	✓			×		
Hill station	×			✓		

Now, as per the condition (6) (L and M are not alike), M can not be an Industrial city. Also M is not a historical place either. Therefore, it is very obvious that M is a hill station. Again, in the given problem there is no negative information about N. Hence, we can assume that N is a hill station as well as a historical place and an industrial city. Combining if these aspects, the following table will be prepared finally.

	L	M	N	O	P	Q
Historical place	×	×	✓	×	×	✓
Industrial city	✓	×	✓	×	✓	✓
Hill station	×	✓	✓	✓	✓	✓

Now, after analysing the given questions we get the following answer:-

Q. (1) (b) Q. (2) (c) Q. (3) (c) Q. (4) (a) Q. (5) (d)

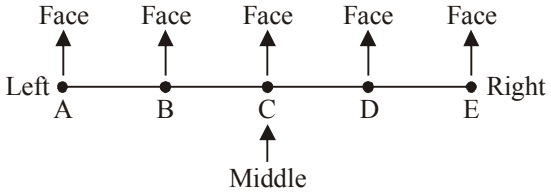
2. Problems Based On Arrangement

In such problems a group of people, objects, etc, may have to be is arranged in a row, or in a circle or any other way. Let us see the example given below:-

LINEAR ARRANGEMENT

One Row Sequence

(A) When direction of face is not clear, then we take ourself as base and then the diagram will be as follows

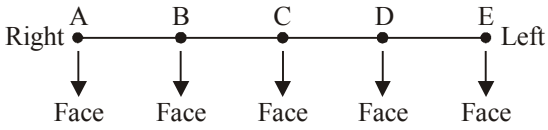


From the above diagram, it is clear that

(i) B, C, D, E are **right** of A but **only** B is the **immediate right** of A.

(ii) D, C, B, A are **left** of E but **only** D is the **immediate left** of E.

(B) When direction of face is towards you, then the diagram will be as follows



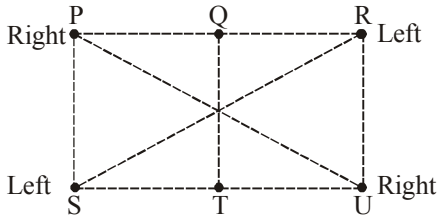
From the above diagram, it is clear that

(iii) B is **immediate left** of A, C is **immediate left** of B; D is **immediate left** of C and E is **immediate left** of D.

(iv) D is **immediate right** of E; C is **immediate right** of D; B is **immediate right** of C; and A is **immediate right** of B.

Two Rows Sequence

Let us see 6 persons seating in two rows



From the above diagram, it is clear that

(i) P is sitting **opposite** S.

(ii) Q is sitting **opposite** T.

(iii) R is sitting **opposite** U.

(iv) P and U are sitting at **diagonally opposite** positions.

(v) S and R are sitting **diagonally opposite** positions.

EXAMPLE **2. Directions (Questions 1 to 5):** Just read the following informations carefully to answer the questions given below it:

Five friends P, Q, R, S, and T are sitting on a bench.

(1) P is sitting next to Q.
(2) R is sitting next to S.
(3) S is not sitting with T.
(4) T is on the last end of the bench.
(5) R is on the 2nd position from the right.
(6) P is on the right of Q and T.
(7) P and R are sitting together.

1. All what position is P sitting?
(a) Between S and R (b) Between S and R
(c) Between T and S (d) Between S and T
(e) Between Q and R

2. Who is sitting in the centre?
(a) P (b) Q (c) R
(d) S (e) T

3. R is sitting between.....
(a) Q and S (b) P and T
(c) S and T (d) P and S
(e) P and Q

4. What is the position of S?
(a) Extreme left (b) Extreme right
(c) Third from left (d) Second from left
(e) None of these

5. What is the position of Q?
(a) 2nd from right (b) Centre
(c) Extreme left (d) 2nd from left
(e) None of these

Now, point to be noted that in arrangement problems the actual information can be classified into 2 categories:-

(a) Definite information

A definite information is one when the place of object/man is definitely mentioned.

(b) Comparative information

In such information the place of object/man is not mentioned definitely but only a comparative position is given. In other words the positions of objects/men are given in comparision to another objects/men.

Now, to solve the problem go as per the following steps:-

Step I Sketch a diagram of empty places

Step II. Fill up as many empty places as possible using all the definite informations.

Step III. With the help of comparative information consider all possibilities and select the possibilities which does not violate any condition.

Now, we can solve the above example :

Here 4th and 5th sentences constitute definite information:

Comparative informations are: 1st, 2nd, 6th and 7th sentences while 3rd is a negative information.

Now, start with definite information, sketch the following arrangement:-

T __ __ R __

Now, this is the time to look for the comparative informations that tell about T and R. Such informations are 2nd, 6th and 7th sentences. Take the 7th and the 1st sentence. If P and R are together and also Q and P are together, then P must be between Q and R. Now the arrangement take the form as:-

T Q P R ____

By the virtue of the 2nd sentence:

T Q P R S

Now, look at the given questions and check that you get the following answer:-

Q. (1) (e) Q. (2) (a) Q. (3) (d) Q. (4) (b) Q. (5) (d)

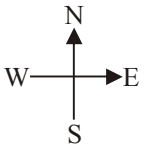
CIRCULAR ARRANGEMENT

Circle is the most important case from the exam point of view. Most of the times Circle kind of statements are there in exams.

From the exam point of view, in most cases they give 8 persons sitting in the circle.

But before solving the important thing is their ' Sitting Position '.

Step 1. Knowing NEWS! N= North , E= East , W=West , S= South

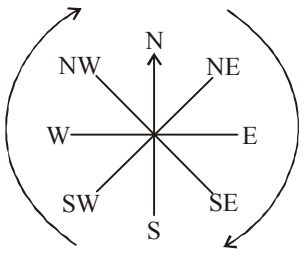


To remember this just remember combination ' North - South ' & ' West - East ' which comes together to each other respectively.

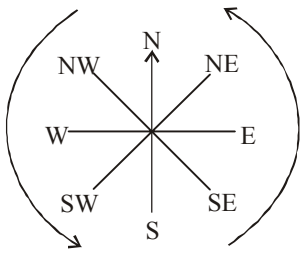
Step 2 : Picking Left & Right .

- Facing Center

Clock wise = Left



Anti - Clock wise = Right



- Facing Outside

If it is mention in the statement that all is facing outside then just do opposite of above like this:

Clock wise = Right & Anti- clock wise = Left

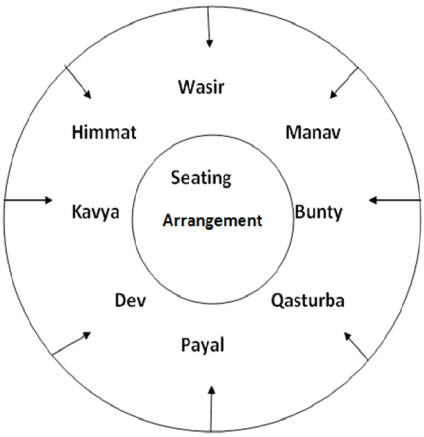
Step 3 : Solving step wise the statement or Following the statement.

EXAMPLE **3. Directions (Qs. 1-5) Study the following information carefully and answer the questions given below.**

Bunty, Dev, Manav, Kavya, Payal, Qasturba, Wasir and Himmat are sitting around a circle facing at the centre. Manav is to the immediate right of Bunty who is 4th to the right of Kavya. Payal is 2nd to the left of Bunty and is 4th to the right of Wasir. Qasturba is 2nd to the right of Dev who is 2nd to the right of Himmat.

1. Who is 3rd to the right of Bunty?
   (a) Wasir (b) Manav
   (c) Kavya (d) Himmat
   (e) None of these
2. Which of the following represents the immediate neighbours of D?
   (a) Payal and Qasturba (b) Kavya and Himmat
   (c) Payal and Himmat (d) Kavya and Qasturba
   (e) Payal and Kavya
3. Who is 3rd to the right of Wasir?
   (a) Payal (b) Dev
   (c) Kavya (d) Qasturba
   (e) Data inadequate
4. Who is 2nd to the left of Payal?
   (a) Dev (b) Himmat
   (c) Kavya (d) Data inadequate
   (e) None of these
5. Who is to the immediate left of Bunty?
   (a) Qasturba (b) Payal
   (c) Wasir (d) Data inadequate
   (e) None of these

Sol.



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

3. Problems Based On Comparision

In such problems comparision of different objects or persons has to be made. Such comparisions are done on the basis of marks, ages heights, etc.

Let us see the following examples:-

EXAMPLE **4. Directions (Qs. 1-5) : Read the informations given below to answer the given questions:**

(1) 7 students A, B, C, D, E, F and G take a series of tests.
(2) No two students obtain the same marks.
(3) G always scores more than A.
(4) A always scores more than B.
(5) Each time either C scores the highest and E gets the least, or alternatively D scores the highest and F or B scores the least.

1. If D is ranked 6th and B is ranked 5th, which of the following can be true?
(a) G is ranked 1st or 4th (b) C is ranked 2nd or 3rd
(c) A is ranked 2nd or 5th (d) F is ranked 3rd or 4th
(e) E is ranked 4th or 5th.

2. If C gets most, G should be ranked not lower than -----
(a) 2nd (b) 3rd (c) 4th
(d) 5th (e) 6th.

3. If C is ranked 2nd and B is ranked 5th, which of the following must be true?
(a) D is ranked 3rd (b) E is ranked 6th
(c) A is ranked 6th (d) G is ranked 4th
(e) F is ranked 6th.

4. If D is ranked 2nd, which of the following can be true?
(a) F gets more than G (b) G gets more than D
(c) A gets more than C (d) A gets more than G
(e) E gets more than B

5. If G is ranked 5th, which of the following must be true?
(a) D scores the highest (b) C is ranked 2nd
(c) E is ranked 3rd (d) B is ranked 4th
(e) F scores the least

Method to Solve

If you give a serious look to the problem you will find that such problems are as same as the arrangement problems. Therefore, we have to go like arrangement problem while solving problems based on comparision.

Solution (Ex. 3)

In this case, we see there is no definite information. Sentence 5 gives a definite information but it is conditional. Still, we draw all the possibilities based on sentence 5.

(1) C _ _ _ _ _ _ E
or, (2) D _ _ _ _ _ _ F
or, (3) D _ _ _ _ _ _ B

We see that the two additional informations (3) and (4) are inadequate to reach a definite conclusion. Hence, keeping these in mind. We move on to the given questions.

1. D is ranked 6th and B is 5th. This does mean that possibilities (2) and (3) are violated. Hence, possibility (1) must be true. Thus, we have:
C _____ B D E
Also by virtue of (3) and (4) we can have only one arrangement for G, A and B which is GAB. Accordingly, there are two possibilities:
C G F A B D E
or, C G A F B D E
∴ Correct answer: (d).

2. Just see the analysis of Q (1)
∴ Correct answer: (c).

3. C is ranked 2nd does mean possibility (1) is false. Therefore, possibilities (2) and (3) remain. Now, B is ranked 5th does mean possibility (3) is false.
Hence, possibility (2) remains:
D C _ _ B _ F
Now, by virtue of (3) and (4), we must have G and A before B in that order. Consequently the 6th place would go to the only letter remaining that is E.
Hence, D C G A B E F
∴ Correct answer: (b).

4. D is ranked 2nd does mean possibilities (2) and (3) are false. Hence possibility (1) is true. Now look at the analysis of Question (1) and you will get the correct answer as: (a).

5. If G is ranked 5th, we can not definitely say which among the three possibilities (1), (2) and (3) are true or false. But sentences (3) and (4) definitely imply that the position of A will be 6th and that of B seventh. Now if B is 7th, it does mean that possibility (3) is true. Hence, we have
D ? ? ? G A B.
∴ Correct answer (a).

4. Problems Based On Blood Relation

Such problems involves analysis of certain blood relations. Let us see the problems given below:-

EXAMPLE **5. (Directions Qs. 1-5) : Read the following information carefully and answer the questions given below:**

There are 6 members in a family. They are M, N, O, P, Q, R are travelling together. N is the son of O but O is not the mother of N. M and O are a married couple. Q is the brother O. P is the daughter of M. R is the brother of N.

1. How many male members are there in the family?
(a) 1 (b) 3 (c) 2
(d) 4 (e) 5

2. Who is the mother of N?
(a) P (b) R (c) Q
(d) M (e) None of these

3. How many children does M have?
(a) 1 (b) 2 (c) 3
(d) 4 (e) None of these

4. Who is the wife of Q?
(a) M (b) R (c) N
(d) Can't be determined (e) None of these

5. Which of the following is a pair of females?
(a) MQ (b) NP (c) PR
(d) MP (e) None of these

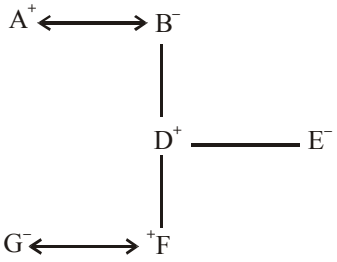
6. How is Q related to P?
(a) Father (b) Brother
(c) Uncle
(d) Can't be determined (e) None of these

To solve such questions, remember the following point:-
Draw a family tree using
(i) Vertical/diagonal lines to represent parent-child relationships
(ii) Single/double horizontal line like $(\leftrightarrow / \Leftrightarrow)$ to represent marriages

(iii) a dashed line (—) for brother and sister relationship

(iv) '+' sign for male and '–' sign for female

For example.



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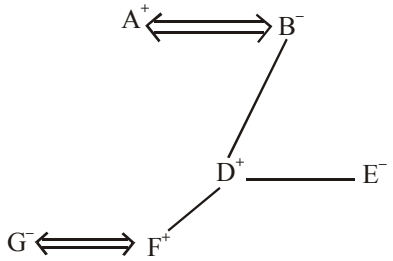

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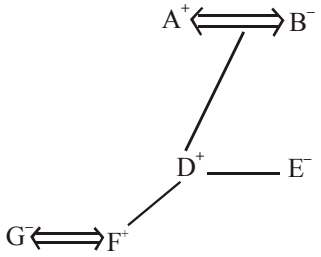


The above diagrams tells us:-

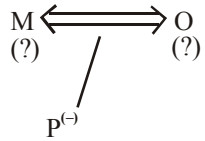
(a) A and B are couple; A is the husband while B is the wife.
(b) D is son of A and B while E is daughter of A and B.
(c) D is the brother of E and E is the sister of D.
(d) D has a son F
(e) F and G are couple; F is the husband and G is the wife.
(f) F is the grandson of A and B.
(g) G is the daughter in law of D.
(h) E is the aunt (Bua) of F
(i) There are 3 males (A, D and F) and 3 females (B, E, G)

Now that you have learnt how to make a family tree. Let us see the actual method of solving the problem.

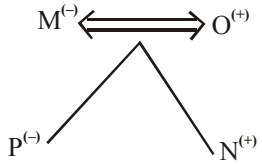
Solution

Here all the sentences are actual information except the first out of these the 2nd and the fifth sentences give information on parent child relationship. We can begin with either of the two. Let us begin with the 6th sentence. Our diagram will be as

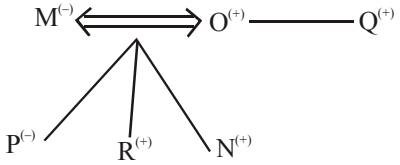
As we do not want to make many diagrams and instead we would prefer to only add to the existing diagsams. Therefore we should look for sentences that talk of M or P. The 3rd sentence talks about M. Hence, we add this information, that M and O are married couple in our diagram.



Now the 2nd sentence talks about O. It says that N is the son of O but O is not the mother of N. Obviously, O must be the father of N. This means O is a male and hence M must be a female. Now our diagram takes the form as following:-



Now, we add the two sentences 'Q is the brother of O' and 'R is the brother of N' and we get the final diagram as below:-



Now, you can read the questions to check your answer:-

Q. (1) d Q. (2) d Q. (3) c Q. (4) d
Q. (5) d Q. (6) c

5. Problems Based On Blood Relations and Profession:

Such problems are very much similar to the problems related to blood relation. What makes it different is the addition of new data:- the professions of family members. You will get the more clear idea about this type of problem. Let us see the example given below:-

EXAMPLE **6. Directions (Qs. 1-5): Read the following information carefully and answer the questions given below it:**

(1) A, B, C, D, E and P are members of a family.
(2) There are two married couples.
(3) B is an engineer and the father of E
(4) P is the grandfather of C and is a lawyer.
(5) D is the grandmother of E and is a housewife.
(6) There is one engineer, one lawyer, one teacher, one housewife and two students in the family.

1. Who is the husband of A?
(a) C (b) E (c) B
(d) D (e) None of these

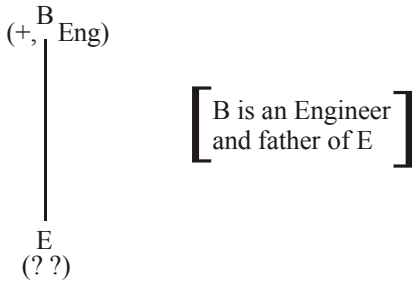
2. Which of the following are two married couple?
(a) PD, BA (b) PD, BE
(c) PD, CA (d) ED, CP
(e) None of these

3. Which of the following is definitely a group of male members?
(a) B, P, E (b) P, E
(c) B, P, A (d) B, P
(e) None of these

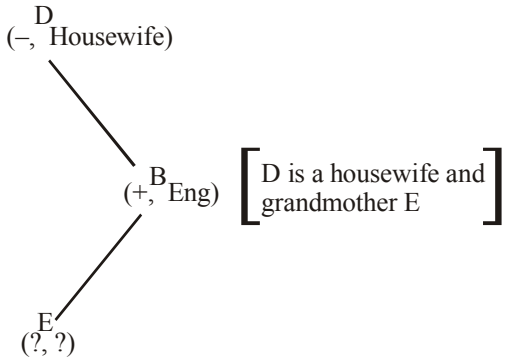
4. Who is the sister of E?
   (a) C (b) D
   (c) A (d) Data inadequate
   (e) None of these
5. What is the profession of A?
   (a) Housewife (b) Engineer
   (c) Teacher (d) Engineer or Teacher
   (e) Housewife or Teacher

Solution

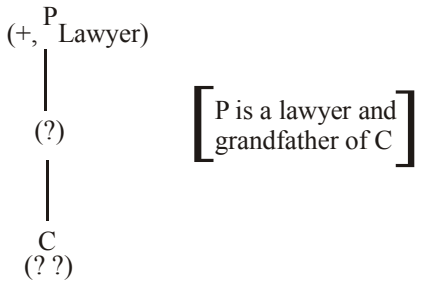
Here, (1), (2), and (6) are useful secondary informations. While (3), (4) and (5) are the actual informations. We start with the 3rd sentence because it mentions a parent. Child relationship its diagram can be made as the following:-



Now, we move on to another sentence that involves either B or E. You see that the 5th sentence gives some information about E. It says that D is the grandmother E. Point to be noted that if D is the grandmother of E, then the son of D must be father of E and hence B is the son of D. Now, the diagram takes the following form.

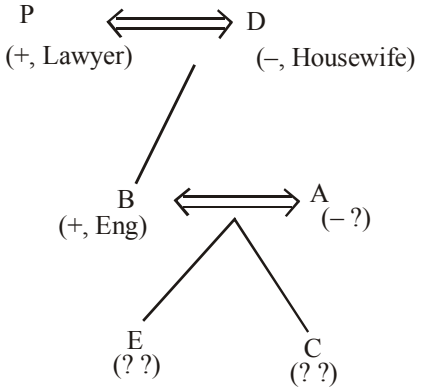


Now, the 4th sentence has the remaining information and diagram for it is given below:-



Now, we see that we have ended up with two different component. Then how to resolve this deadlock? The answer is simple: - to resolve it we make use of the given useful secondary information (USI).

"There are two married couple in the family." Clearly, the two possible pairs are of grandfather, grandmother and father, mother. Therefore, we combine the two diagrams into the following way.



Point to be noted that the professions of A, E and C are yet unknown. However, with reasonable justification, we may assume that the mother (A) should be the teacher and the two children E and C should be students. But this conclusion can be challenged and has no reason at all.

Apart from that the sexes of E and C can not be determined.

Now, read the question and check your answer one by one:-

Q. (1) c Q. (2) a Q. (3) d
Q. (4) d Q. (5) c

6. Problems Based On Conditional Selection:

In this type of problems, a group of objects/persons has to be selected from a given larger group, as per the given restrictions. You will get the better idea of such type of problem from the problem given below:-

EXAMPLE **7. Directions (Qs. 1-5) : Study the following information carefully and answer the questions given below:-**

From, amongst 6 boys J, K, L, M, N, and O and 5 girls P, Q, R, S and T, a team of 6 is to be selected under the following conditions:-

(i) J and M have to be together.
(ii) L can not go with S.
(iii) S and T have to be together.
(iv) K can not be teamed with N.
(v) M cannot go with P.
(vi) K and R have to be together.
(vii) L and Q have to be together.

1. If there be 5 boys in the team, the lone girl member is ------
   (a) P (b) Q (c) R
   (d) S (e) None of these
2. If including R, the team has three girls, the members other than R are ------
   (a) K L O P Q (b) JMNST
   (c) JMKST (d) KORST
   (e) None of these
3. If, the team including L consists of 4 boys the members of the team other than L are ------
   (a) JMNPQ (b) JKMQR
   (c) MNOJQ (d) KNORQ
   (e) None of these
4. If 4 members including N, have to be boys, the members other than N are ------
   (a) JKLQR (b) JMOST
   (c) KLOQR (d) JLMOQ
   (e) None of these.

5. If 4 members have to girls, the members of the team are ----
   (a) KLPQRS (b) KOPRST
   (c) KLQRST (d) KLPQRT
   (e) None of these

Solution

Solving problems like example 7 is very easy. Make the group of all the pairs that have to be together on one side and the pairs that must not be together on the other side. Next, read each of the questions and treat that as an additional information. Finally analyse the possibilities and choose the possibilities that satisfies all the conditions. Let us see the process below:-

1stly, we can summarise the conditions in the following way:-

J, M	S, T
(+)(+)	(−)(−)
K, R	L, Q
(+)(−1)	(+)(−)

→ Group 'must be together'.

L, S,	K, N,	M, P
(+) (−)	(+) (+)	(+) (− 1)

→ Group never be together'

Now we move on to questions one by one.

1. Here, number of boys are 5. We see than K and N can never be together. Therefore, there are only two ways of selecting 5 boys:- JKLMO and JNLMO. But the possiblity is not possible because if K would go then R should also go, and if L goes than Q should also go. Hence, JNLMO is the only possibility in which L's friend Q would be the lone girl member.

   ∴ Correct answer choice is (b).

2. There are three girls including P. P is there, so M must not be there. If M is not there, J would not be there. So two boys J and M are eliminated. Since, the team should have only 6 members, hence there should be three boys. Two boys J and M are eliminated. Therefore, the possibilities of selecting three boys are :- KLN, KLO, KNO, LNO. But K and N can't be together. Hence the remaining possibilities are KLO and LNO. Now, K must be with R and L must be with Q. Therefore, we have PKRLQO and PLQNO. To the 2nd possibility we need to add a girl. We can't add R since R can't go without K. We can't add T since T can't go withouts. Conversely, we can't add S either. Hence, this possibility is also eliminated. This, the only possible choice remains PKRLQO.

   ∴ Correct answer choice is (a).

Quicker method:

Start with the answer choices. Choice (b) and choice (c) have M in them. M can't go as P is there. Choice (d) is not correct as it has more than three girls including P. Hence, the correct answer choice must be either (a) or (c). But on verifying we see that a is indeed the correct choice as it does not violate any restriction.

∴ Correct answer choice is (a).

3. There are 4 boys including L. So there must be two girls. Now if L is present, S can't go and if S can't go, T won't go. Hence, three girls remain:- P; Q and R out of these, two can be selected in the ways given below:-

   PQ, PR, and QR.

   Now, if P is selected, M can't go and if M can't go, J will not go. In such case the team would have to include K and N as 4 boys hence to be selected. But K and N can't be together. This means that P should not be selected. Therefore, the only possibility of selecting two girls is QR. But R means the necessary inclusion of K, which in turn means necessary inclusion of N. Hence, the possible combination is LKQR. To this we should add two boys out of J, M and O. The only possibility is adding J and M as neither of these would go without the other. Hence, the team is JMLKQR.

   ∴ Correct answer choice is (b).

Quicker method

Choice (a) is incorrect as it has M and P together. Choice (c) is incorrect as it has only one girl. Choice (d) is incorrect as it has K and N together. Hence, two choices (b) and (e) remain. On verifying we see that (b) is the correct answer choice.

4. Inclusion of N ⇒ Exclusion of k ⇒ Exclusion R. Four boys does mean there should be two girls. How do you select 2 girls out of P, Q, S and T if S and T have always to be together? The only two possible way are:- P, Q, and S, T. If we choose P we can't select M, and hence we can't select J either. This means the exclusion of J and M in addition to that of K. Since, this is not possible in order to have four boys, we must not select P. Hence, we select S.T. Now, selecting S means excluding L. Hence, K and L are excluded. The team would be: - JMNOST

   ∴ Correct answer choice is (b).

EXERCISE

Directions (Qs. 1-5): Study the following information carefully and answer the questions given below:
A, B, C, D, E, F and G are seven persons who travel to office everyday by a particular train which stops at five stations I, II, III, IV and V respectively after it leaves base station.
(1) Three among them get in the train at the base station.
(2) D gets down at the next station at which F gets down.
(3) B does not get down either with A or E.
(4) G alone gets in at station III and gets down with C after having passed one station.
(5) A travels between only two stations and gets down at station V.
(6) None of them gets in at station II.
(7) C gets in with F but does not get in with either B or D.
(8) E gets in with two others and gets down alone after D.
(9) B and D work in the same office and they get down together at station III.
(10) None of them gets down at station I.

1. At which station does E get down?
(a) # II (b) # III
(c) # IV (d) Data inadequate
(e) None of these
2. At which station do C and F get in?
(a) # I (b) # II
(c) # III (d) Data inadequate
(e) None of these
3. At which of the following stations do B and D get in?
(a) # I (b) Base station
(c) # III (d) Data inadequate
(e) None of these
4. After how many stations does E get down?
(a) One (b) Two
(c) Three (d) Four
(e) Five
5. E gets down after how many stations at which F gets down?
(a) Next station (b) Two
(c) Three (d) Four
(e) None of these

Directions (Qs. 6-10): Study the following information carefully and answer the questions given below:
P, Q, R, S, T, V and *W* are travelling in three different vehicles. There are at least two passengers in each vehicle– I, II & III and only one of them is a male. There are two engineers, two doctors and three teachers among them.
(i) *R* is a lady doctor and she does not travel with the pair of sisters, *P* and *V*.
(ii) *Q*, a male engineer, travels with only *W*, a teacher in vehicle I.
(iii) *S* is a male doctor.
(iv) Two persons belonging to the same profession do not travel in the same vehicle.
(v) *P* is no an engineer and travels in vehicle II.

6. What is *V*'s profession?
(a) Engineer (b) Teacher
(c) Doctor (d) Data inadequate
(e) None of these
7. In which vehicle does *R* travel?
(a) I (b) II
(c) III (d) II or III
(e) None of these
8. Which of the following represents the three teachers?
(a) WTV (b) WTP
(c) WTV or WTP (d) Data inadequate
(e) None of these
9. Which of the following is not correct?
(a) T-Male-Teacher (b) Q-Male-Engineer
(c) P-Female-Teacher (d) V-Female-Teacher
(e) W-Female-Teacher
10. How many lady members are there among them?
(a) Three (b) Four
(c) Three or Four (d) Data inadequate
(e) None of these

Directions (Qs. 11-15): Study the following information and answer these questions :
(A) P, Q, R, S, T, U and V are sitting in a circle facing the centre.
(B) S, who is second to the right of R, is not to the immediate right of V.
(C) U is not between V and T.
(D) P is between R and Q.

11. Which of the following is **wrong?**
(I) T is to the immediate left of R.
(II) Q is to the immediate left of U.
(III) U, S and T are in a sequence, one after the other.
(a) Only I (b) Only II
(c) Only III (d) Only I and II
(e) All I, II and III
12. Which of the following are the two pairs of adjacent is members?
(a) VS and TR (b) SU and PQ
(c) PR and TQ (d) VU and QR
(e) None of these
13. What is the position of T?
(a) To the immediate left of R
(b) Second to the left of P
(c) Fourth to the left of U
(d) Second to the left of V
(e) None of these
14. Which of the following is **correct?**
(I) V is third to the left of R.
(II) U is between S and V
(III) Q is to the immediate left of P.
(a) Only I (b) Only II
(c) Only III (d) Only II and III
(e) None of these

15. If Q and R interchange places so as T and V, then
(a) S is third to the right of R
(b) T is second to the left of R
(c) Q is fourth to the right of T
(d) V is third to the right of U
(e) None of these

Directions (Qs. 16-20): Study the following information carefully and answer the questions given below :
Ten persons A, B, C, D, E, F, G, H, I and J, are sitting in two rows with five persons in each row in such a way that one person in the first row sites exactly opposite and facing a person in the second row. Members of the first row are facing North.
B sits in the first row to the immediate right of H who sits exactly opposite of D. C is at the extreme end of second row and is second to the left of D. A is to the immediate right of D and exactly opposite to F. G sits exactly opposite to E who is at one of the ends of the second row. J does not sit at the end.

16. Who is second to the left of B ?
(a) I (b) G
(c) H (d) F
(e) None of these

17. Which of the following pairs of persons are sitting at the two ends of the first row ?
(a) GJ (b) EI
(c) GI (d) EJ
(e) None of these

18. Who sits exactly opposite to B ?
(a) J (b) I
(c) G (d) A
(e) None of these

19. Who is third to the left of E ?
(a) D (b) I
(c) H (d) C
(e) None of these

20. A sits between which of the following persons ?
(a) DJ (b) ED
(c) FB (d) BI
(e) None of these

Directions (Qs. 21-25) : Studay the following information and answer the questions given below.
Eight people E, F, G, H, J, K, L and M are sitting around a circular table facing the centre, Each of them is of a different profession Chartered Accountant, Columnist, Doctor, Enginneer, Financial Analyst, Lawyer, Professor and Scientist but not necessarily in the same order. F is sitting second to the left of K. The Scientist is an immediate neighbour of K. There are only three people between the Scientist and E. Only one person sits between the Engineer and E. The Columnist is to the immediate right of the Engineer. M is second to the right of K. H is the Scientist. G and J are immediate neighbours of each other. Neither G nor J is an Engineer. The Financial Analyst is to the immediate left of F. The Lawyer is second to the right of the Columnist. The Professor is an immediate neighbour of the Engineer. G is second to the right of the Chartered Accountant.

21. Who is sitting second to the right of E ?
(a) The Lawyer (b) G
(c) The Engineer (d) F
(e) K

22. Who amongst the following is the Professor ?
(a) F (b) L
(c) M (d) K
(e) J

23. Four of the following five are alike in a certain way based on the given arrangment and hence froma group. Which of the following does not belong to that group ?
(a) Chartered Accountant-H
(b) M-Doctor
(c) J-Engineer
(d) Financial Analyst-L
(e) Lawyer-K

24. What is the position of L with respect to the Scientist ?
(a) Third to the left (b) Second to the right
(c) Second to the left (d) Third to the right
(e) Immediate right

25. Which of the following statements is true according to the given arrangement ?
(a) The Lawyer is second to the left of the Doctor
(b) E is an immediate neighbour of the Financial Analyst
(c) H sits exactly between F and the Financial Analyst
(d) Only four people sit between the Columnist and F
(e) All of the given statements are true.

Directions (Qs. 26- 30): Each of these questions are based on the information given other.

1. 8 persons E, F, G, H, I, J, K and L are seated around a square table - two on each side.
2. There are 3 ladies who are not seated next to each other.
3. J is between L and F.
4. G is between I and F.
5. H, a lady member is second to the left of J.
6. F, a male member is seated opposite to E, a lady member.
7. There is a lady member between F and I

26. Who among the following is to the immediate left of F ?
(a) G (b) I
(c) J (d) H
(e) None of these

27. What is true about J and K ?
(a) J is male, K is female (b) J is female, K is male
(c) Both are female (d) Both are male
(e) None of these

28. How many persons are seated between K and F ?
(a) 1 (b) 2
(c) 3 (d) 4
(e) None of these

29. Who among the following are three lady members ?
(a) E, H and J (b) E, F and G
(c) E, H and G (d) C, H and J
(e) None of these

30. Who among the following is seated between E and H ?
(a) F (b) I
(c) K (d) Cannot be determined
(e) None of these

Directions (Qs. 31-35) : Study the following information carefully and answer the questions given below:

(i) Six students *P, Q, R, S, T* and *U* are in different branches of Engineering, viz. civil, mechanical *M* chemical, electrical, metallurgy and electronics but not necessarily in the same order.

(ii) Each of them is a resident of a different city viz Mumbai, Calcutta, Chennai, Delhi, Hyderabad and Bangalore. *R* is the resident of Delhi but he is not in chemical or electrical. *T*, who is in mechanical, is not the resident of Mumbai or Hyderabad. *Q* is from Calcutta and he is in electrical. The student from Chennai is in electronics and *S* is from Mumbai. *P* is in metallurgy.

31. Which of the following is not the correct combination of student and subject?
(a) P-metallurgy (b) Q-electrical
(c) U-electronics (d) S-civil
(e) All are correct

32. Which student is from Chennai?
(a) R (b) U
(c) S (d) T
(e) None of these

33. *P* is from which city?
(a) Chennai (b) Calcutta
(c) Hyderabad (d) Data inadequate
(e) None of these

34. Which student is from Bangalore'?
(a) T (b) Q
(c) S (d) T or P
(e) None of these

35. *R* is studying which subject?
(a) Electronics (b) Mechanical
(c) Metallurgy (d) Data inadequate
(e) None of these

Directions (Qs. 36-40): Study the following information carefully and answer the questions given below:

(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 — Ist, IInd and IIIrd. Persons working in the same department are not on the same floor. On each floor two persons work.

(i) No two females 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 Ist and IIIrd floors respectively and work in the same department. Q, a female, does not work on IInd floor. P, a male, work on Ist floor.

36. Which of the following groups of persons are females?
(a) SQT (b) QMT
(c) QPT (d) Data inadequate
(e) None of these

37. Which of the following pairs of persons work in Administration?
(a) QP (b) QN
(c) SP (d) Data inadequate
(e) None of these

38. T works in which department?
(a) Accounts (b) Administration
(c) Personnel (d) Accounts or Personnel
(e) None of these

39. Which of the following pairs works on IInd floor?
(a) PT (b) SM
(c) QN (d) QT
(e) None of these

40. 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) Q
(c) N (d) Data inadequate
(e) None of these

Directions (Qs. 41-45) : Study the following information carefully and answer the questions given below:

Seven specialist doctors B, M, K, P, D, F and H visit a polyclinic on four days — Tuesday, Wednesday, Friday and Saturday — in a week. At least one doctor but not more than two doctors visits the polyclinic on each of these days. Each of them is specialist in different fields — ENT, Orthopaedics, Paediatrics, Neurology, Ophthalmology, Radiology and Oncology.

(i) P visits on Friday with Radiologist.

(ii) The Paediatrician does not visit on Saturday nor with D and H.

(iii) The Oncologist F visits alone on Tuesday.

(iv) M visits on Wednesday and he is not Paediatrician.

(v) K visits on Wednesday. H is not Radiologist.

(vi) The Paediatrician visits with the ENT specialist.

(vii) The Neurologist visits on Friday.

(viii) B is neither Orthopaedician nor Radiologist.

41. What is the speciality of B?
(a) Ophthalmology (b) ENT
(c) Paediatrics (d) Data inadequate
(e) None of these

42. On which day of the week does D visit?
(a) Wednesday (b) Saturday
(c) Wednesday or Saturday (d) Friday
(e) None of these

43. Who among them visits the polyclinic along with B ?
(a) None (b) H
(c) D (d) P
(e) Either H or P

44. On which of the following days do the specialists in Orthopaedics and Ophthalmology visit ?
(a) Wednesday (b) Friday
(c) Saturday (d) Data inadequate
(e) None of these

45. What is P's profession?
(a) Paediatriccian (b) ENT
(c) Ophthalmologist (d) Data inadequate
(e) None of these

Directions (Qs. 46-49) : Read the following information carefully and answer the questions given below :

(a) An examiantion board has organised examination for ten subjects viz A, B, C, D, E, F, G, H, I and J on six days of the week with a holiday on Sunday, not having more than two papers on any of the days.
(b) Exam begins on Wednesday with subject F.
(c) D is accompained by some other subject but not on Thursday. A and G are on the same day immediately after holiday.
(d) There is only one paper on last day and Saturday. B is immediately followed by H, which is immediately followed by I.
(e) C is on Saturday. H is not on the same day as J.

46. Examination for which of the following pairs of subjects is on Thursday?
(a) HE (b) DB
(c) FD (d) Data inadequate
(e) None of these

47. Examination for which of the following subjects is on the next day of D?
(a) B (b) C
(c) I (d) H
(e) None of these

48. Examination for which of the following subjects is on the last day?
(a) B (b) E
(c) J (d) Data inadequate
(e) None of these

49. Examination for subject F is on the same day as which of the following subjects?
(a) E (b) D
(c) I (d) B
(e) None of these

Directions (Qs. 50-53): Read the following information carefully and answer the questions given below.

A, B, C, D, E, F and G are seven students in a class. They are sitting on three benches I, II and III in such way that there is at least two of them on each bench and there is at least one girl on each bench. C, a girl student, does not sit with A, E and D. F, a boy student, sits with only B. A sits with his best friend on bench I. G sits on bench III. E is brother of C.

50. How many girl students are there?
(a) 3 (b) 4
(c) 3 or 4 (d) Data inadequate
(e) None of these

51. Who sits with C?
(a) B (b) G
(c) D (d) E
(e) None of these

52. Which of the following is a group of girls?
(a) BAC (b) BFC
(c) CDF (d) BCD
(e) None of these

53. On which bench do three students sit?
(a) II (b) III
(c) I (d) I or II
(e) None of these

Directions (Qs. 54-56): Read the following information carefully and answer the questions given below:

Six persons *A, B, C, D, E* and *F* took up a job with a firm in a week from Monday to Saturday. Each of them joined for different posts on different days. The post were of – Clerk, Officer, Technician, Manager, Supervisor, and Sales Executive, though not respectively.

F joined as a Manager on the first day. *B* joined as a Supervisor but neither on Wednesday nor Friday. *D* joined as a Technician on Thursday. Officer joined the firm on Wednesday. *E* joined as a Clerk on Tuesday. *A* joined as a Sales Executive.

54. Who joined the firm on Wednesday?
(a) B (b) C
(c) B or C (d) Data inadequate
(e) None of these

55. Who was the last person to join the firm?
(a) E (b) F
(c) A (d) B
(e) None of these

56. On which of the following days did the Sales Executive join?
(a) Tuesday (b) Thursday
(c) Saturday (d) Wednesday
(e) None of these

Directions (Qs. 57-60): Read the following information carefully to answer the questions given below:

(i) There are six different books on different subjects *P*, *Q, R, S, T* and *U*. These books are kept one above the other on a shelf. These books belong to six different persons - *A, B, C, D, E* and *F*. It is not necessary that the orders of these books and persons are the same.
(ii) Only book of subject *Q* is kept between the books of subject *P* and *T* and only book of subject *S* is kept between books of subject *P* and *U*. The book of subject *R* is immediately above the book of subject *T*.
(iii) *C*'s book is kept on the top. A does not have books on subjects *T* and *S*. The book on subject *P* belongs to *F*. The book on subject *U* belongs neither to *B* nor to *A*. *D*'s book is kept at the bottom.

57. The book on which of the following subjects belongs to *A*?
(a) Q (b) S
(c) P (d) T
(e) None of these

58. Who among the following possesses the book on subject *T*?
(a) B (b) E
(c) C or E (d) B or E
(e) None of these

59. Who owns the book on subject U?
(a) B (b) E
(c) D (d) C
(e) None of these

60. The book on which of the following subjects is kept on the top?
(a) T (b) R
(c) U (d) Data inadequate
(e) None of these

Directions (Qs. 61-63): Read the following information carefully and answer the questions given below:

(I) Maths, Physics, Chemistry, Botany, Zoology and Statistics are six subjects on which a series of lectures are to be organised on a day, though their order is not necessarily the same.

(II) The lectures on Zoology and Chemistry are to be organised either in the beginning or at the end:

(III) The lecture on Physics is to be organised immediately before that on Botany. The lecture on Statistics is to be organised immediately after that on Botany:

(IV) There will be a small break after the lecture on Physics and each lecture will be of 45 minutes' duration.

(V) There will be only two lectures before Physics and the lecture on Chemistry is to be organised immediately before that on Maths.

61. In the series of lectures, the lecture on which of the following subjects is to be organised immediately before the last lecture?
(a) Botany
(b) Zoology
(c) Either Zoology or Botany
(d) Data inadequate
(e) None of these

62. Which of the above given statements is not necessary to answer the questions?
(a) V (b) IV
(c) III (d) II
(e) None of these

63. Which of the lectures is to be organised immediately before the physics lecture?
(a) Maths (b) Zoology
(c) Chemistry (d) Data indadquate
(e) None of these

Directions (Qs. 64-66) : Read the following in formation carefully and answer the questions given below.

(i) Five students Sujit, Randhir, Neena, Mihir and Vinay have total five books on subjects Physics, Chemistry, Maths, Biology and English written by authors Gupta, Khanna, Harish, D'Souza and Edwin. Each student has only one book on one of the five subjects.

(ii) Gupta is the author of Physics book, which is not owned by Vinay or Sujit.

(iii) Mihir owns the book written by Edwin.

(iv) Neena owns Maths book. Vinay has English book, which is not written by Khanna. Biology book is written by D'Souza.

64. Which of the following is the correct combination of subject, student and author?
(a) Maths-Neena-Harish (b) Physics-Mihir-Gupta
(c) English-Vinay-Edwin (d) Biology-Sujit-D'Souza
(e) None of these

65. Who is the author of Chemistry book?
(a) Harish only (b) Edwin only
(c) Khanna or Harish (d) Edwin or Khanna
(e) Data inadequate

66. Who is the owner of the book written by Harish?
(a) Vinay (b) Sujit
(c) Randhir (d) Data inadequate
(e) None of these

Directions (Qs. 67-70) : Read the following information carefully to answer these questions.

(i) In a family of six members A, B, C, D, E and F each one plays one game out of the six games Chess, Carrom, Table tennis, Badminton, Bridge and Cricket.

(ii) Two are married couples.

(iii) B, who plays Carrom, is daughter-in-law of E.

(iv) A is father of D, the Table-tennis player, and D is father of C, who plays Cricket

(v) F is brother of C.

(vi) Chess is not played by a female member.

(vii) E's husband plays Badminton.

67. Who among them plays Bridge?
(a) E (b) F
(c) A (d) Data inadequate
(e) None of these

68. How is F related to A?
(a) Granddaughter (b) Grandson
(c) Son (d) Daughter
(e) None of these

69. Who is husband of B?
(a) Data inadequate (b) A
(c) C (d) D
(e) F

70. How many male members are there in the family?
(a) Two only (b) Three only
(c) Four only (d) Data inadequate
(e) None of these

Directions (Qs. 71 - 74): Read the following information carefully and answer the questions given below :

(i) There are five types of cards viz. A, B, C, D and E. There are three cards of each type. These are to be inserted in envelopes of three colours- red, yellow and brown. There are five envelopes of each colour.

(ii) B, D and E type cards are to be inserted in red envelopes; A, B and C type cards are to be inserted in yellow envelopes; and C, D and E type cards are to be inserted in brown envelopes.

(iii) Two cards each of B and D type are inserted in red envelopes.

71. How many cards of E type are inserted in brown envelopes?
(a) Nil (b) One
(c) Two (d) Three
(e) Data inadequate

72. Which of the following combinations of the type of cards and the number of cards is **definitely correct** in respect of yellow-coloured envelopes?
(a) A-2, B-1, C-2 (b) B-1, C-2, D-2
(c) A-2, E-1, D-2 (d) A-3, B-1, C-1
(e) None of these

73. Which of the following combinations of types of cards and the number of cards and colour of envelope is **definitely correct**?
(a) C-2, D-1, E-2, Brown (b) C-l, D-2, E-2, Brown
(c) B-2, D-2, A-1, Red (d) A-2, B-2, C-1, Yellow
(e) None of these

74. Which of the following combinations of colour of the envelope and the number of cards is **definitely correct** in respect of E type cards?
(a) Red-2, Brown-1 (b) Red-1, Yellow-2
(c) Red-2, Yellow-1 (d) Yellow-1, Brown-2
(e) None of these

Directions (Qs. 75-78): Study the following information and answer the questions given below:
(i) 6 picture cards A, B, C, D, E and F are printed in six different-coloured inks / blue, red, green, grey, yellow and brown / and are arranged from left to right (not necessarily in the same order and colour as given).
(ii) The pictures were of King, Princess, Queen, Palace, Joker and Prince.
(iii) The picture of palace was in blue colour but it was not printed on card D.
(iv) Card 'A', which was bearing Queen's picture printed in brown ink, was at the extreme right.
(v) The picture of princess was neither on card D nor E and was not printed in either green or yellow ink card 'C' had picture of King printed in 'grey' ink and it was fifth from right and next to card B having picture of prince.

75. If the Princess's card is between the cards of the palace and prince, then at what number the Joker's card is placed from left?
(a) First (b) Fourth
(c) Fifth (d) Second
(e) None of these

76. Which of the following combinations of card and colour is TRUE for picture of princess?
(a) E-Yellow (b) F-Red
(c) B-Green (d) Data inadequate
(e) None of these

77. In which colour was the picture of Joker printed?
(a) Data inadequate (b) Yellow
(c) Red (d) Green
(e) None of these

78. Picture of palace was printed on which of the following cards?
(a) E (b) F
(c) D (d) Either D or E
(e) None of these

Directions (Qs. 79-80): After a cricket series, a panel judged 5 players / Pervez, Jatin, Robin, Dinkar and Rahul and gave them ranking for batting and bowling. The ranking was in descending order. Rahul, who was ranked first in batting, was last in bowling. Robin had same ranking in both and was just above Rahul in bowling. In batting, Pervez was just above Dinkar but in bowling he was in the middle after Jatin.

79. Who was ranked first as bowler?
(a) Jatin (b) Rahul
(c) Robin (d) Data inadequate
(e) None of these

80. Who was ranked fifth in batting?
(a) Dinkar (b) Jatin
(c) Robin (d) Data inadequate
(e) None of these

Directions (Qs. 81 - 84): Read the following information and answer the given questions :
(i) Six friends Ramesh, Dinesh, Lokesh, Nilesh, Shailesh and Hitesh work in different companies, namely 'P', 'Q', 'R', 'S', 'T' and 'U', and each one wears company-sponsored different coloured tie, i.e. Blue, Green, Pink, Yellow, Purple and Red, though not necessarily in the same order.
(ii) The one wearing Blue tie works in Company 'S' and the one wearing Green tie works in Company 'P'.
(iii) Hitesh does not work in Company 'R' or 'T'.
(iv) Ramesh wears Pink tie and works in Company 'Q'.
(v) Nilesh does not work in Company 'T' and purple colour tie is not sponsored by Company 'R'.
(vi) Shailesh works in company 'U' and neither Nilesh nor Dinesh works in company 'S'.
(vii) Company 'T' does not sponsor Purple or Yellow coloured tie and Lokesh works in company P.

81. Which colour tie is sponsored by Company 'R'?
(a) It can not be ascertained
(b) Blue (c) Green
(d) Pink (e) None of these

82. Which of the following "colour of tie-company-person" combinations is correct?
(a) Green-R-Nilesh (b) Blue-S-Lokesh
(c) Red-T-Dinesh (d) Yellow-R-Shailesh
(e) None of these

83. Which of the following is true?
(a) Company 'U' sponsors Green tie.
(b) Shailesh wears Red tie.
(c) Nilesh works in Company 'T'.
(d) Red colour is sponsored by Company 'T'.
(e) None of these

84. Which of the following sequence of companies represents Ramesh, Dinesh, Lokesh, Nilesh, Shailesh and Hitesh in the same order?
(a) Q, P, T, R, U, S (b) Q, T, P, R, U, S
(c) Q, P, T, S, U, R (d) Q, T, S, U, R, P
(e) None of these

Directions (Qs. 85-87): Read the following information carefully and answer the questions given below:
(i) A, B, C, D, E, F, G and H are standing in a row facing North.
(ii) B is not neighbour of G.
(iii) F is to the immediate right of G and neighbour of E.
(iv) G is not at the extreme end.
(v) A is sixth to the left of E.
(vi) H is sixth to the right of C.

85. Who among the following are neighbours?
(a) AB (b) CG (c) FH (d) CA
(e) None of these

86. Which one among the following defines the position of D?
(a) Fourth to the right of H (b) Third to the right of A
(c) Neighbour of B and F (d) To the immediate left of B
(e) None of these

87. Which of the following is true?
(a) C is to the immediate left of A
(b) D is neighbour of B and F
(c) G is to the immediate right of D
(d) A and E are at the extreme ends
(e) None of these

Directions (Qs. 88-90): Study the following information carefully and answer the questions given below:

(i) Five courses A, B, C, D and E each of one month duration are to be taught from January to May one after the other though not necessarily in the same order by lecturers P, Q, R, S and T.
(ii) 'P' teaches course 'B' but not in the month of April or May.
(iii) 'Q' teaches course 'A' in the month of March.
(iv) 'R' teaches in the month of January but does not teach course 'C' or 'D'.

88. Which course is taught by 'S'?
(a) C (b) E
(c) Either C or D (d) D
(e) None of these

89. Which lecturer's course immediately follows after course 'B'?
(a) Q (b) P
(c) S (d) T
(e) None of these

90. Which course is taught in the month of January?
(a) C (b) D
(c) E (d) Data inadequate
(e) None of these

Directions (Qs. 91-93) : Read the following information carefully to answer the questions given below:

The annual gathering of a school was organised on a day in the morning hours. Six different items, viz. drama, singing, mimicry, speech, story-telling and dance, are to be performed by six children A, B, C, D, E and F not necessarily in the same order. The programme begins with song not sung by B and ends with dance. C performs mimicry immediately after speech. E performs drama just before dance. D or F is not available for the last performance. Speech is not given by A. An interval of 30 minutes is given immediately after mimicry with three more items remaining to be performed. D performs immediately after interval.

91. Which item is performed by F?
(a) Drama (b) Song
(c) Speech (d) Story-telling
(e) None of these

92. Who performed dance?
(a) A (b) B
(c) F (d) Data inadequate
(e) None of these

93. Who was the first performer?
(a) A (b) B
(c) C (d) Data inadequate
(e) None of these

Directions (Qs. 94-98) : Study the following information to answer the given questions :

(a) Six plays are to be organized from Monday to Sunday - One play each day with one day when there is no play. 'No play' day is not Monday or Sunday.
(b) The plays are held in sets of 3 plays each in such a way that plays are held without any break i.e. 3 plays are held in such a way, that there is no 'No play' day between them but immediately before this set or immediately after this set it is 'No play' day.
(c) Play Z is held on 26th and play X was held on 31st of the same month.
(d) Play B was not held immediately after play A (but was held after A, not necessarily immediately before Q.
(e) All the six plays were held in the same month.

94. Which play was organized on Monday ?
(a) Z (b) M
(c) Q (d) Can't be determined
(e) None of these

95. Which day was play Z organized ?
(a) Tuesday (b) Monday
(c) Wednesday (d) Can't be determined
(e) None of these

96. Which date was a 'No play' day ?
(a) 26th (b) 28th
(c) 29th (d) Can't be determined
(e) None of these

97. Which of the following is true ?
(a) Play M was organized on Thursday
(b) Play Q was organized in the Middle of the week
(c) There was a gap after 2 plays and then 4 plays were organized
(d) First play was organized on the 25th
(e) Play B was held on Friday

98. Which day was play Q organized ?
(a) Friday (b) Wednesday
(c) Saturday (d) Can't be determined
(e) None of these

Directions (Qs. 99-105): Each of these questions are based on the information given below:

P, Q, R, S, W, X, Y, Z are sitting around a circle facing centre but not necessarily in the same order. The husband of Z is sitting second to the right of Q who is sitting between two males. X sits second to the left of the daughter of S. X is the sister of Y. X is not an immediate neighbour of Z's husband. Only one person sits between P and X. P is the father of Y. S who is brother of Z sits to the immediate left of his mother. Only one person sits between Z's mother and W. Only one person sits between Z and Y. Y is mother of R. Y is not an immediate neighbour of W.

99. Which of following is true with respect to the given seating arrangement?
(a) R is the cousin of W
(b) Z and Z's husband are immediate neighbour of each other.
(c) No female is an immediate neighbour of R.
(d) Z sits third to the left of her daughter.
(e) Q is the mother of Z.

100. What is the position of P with respect to his grandchild?
(a) immediate right (b) third to the right
(c) third to the left (d) Second to the right
(e) fourth to the right

101. Four of the following five are alike in a certain way. Which one does not belong to that group?
(a) X (b) R
(c) W (d) Z
(e) Y

102. What is position of P with respect to his mother-in-law?
(a) Immediate right (b) third to the right
(c) third to the left (d) second to the right
(e) None of these

103. How many people sits between Y and her uncle?
(a) One (b) Two
(c) Three (d) Four
(e) Five

104. Who amongst the following is S's daughter?
(a) Q (b) R
(c) W (d) Y
(e) Z

105. Who sits to the immediate left of R?
(a) X's grandmother (b) Y's son
(c) S's mother-in-law (d) P
(e) Y

Directions (Qs. 106-112) : Study the following information and answer the questions given below:

Eight friends-A, B, C, D, E, F, G and H-are sitting around a circular table not necessarily in the same order. Three of them are facing outward while five are facing towards the centre. There are equal number of males and females in the group. C is facing the centre. E is sitting third to the right of C. F is sitting third to the left of E. Three persons are sitting between F and B. The immediate neighbours of B are females. G is sitting third to the right of F. D is sitting third to the right of A. A is not an immediate neighbour of E. The immediate neighbours of E are males and are facing the centre. The immediate neighbours of D are females and face outside. The one sitting third to the left of B is a male. No female is an immediate neighbour of G.

106. Who is sitting second to the right of E?
(a) C (b) B
(c) G (d) H
(e) None of these

107. How many persons are sitting between H and C when counted from the left side of H?
(a) One (b) Two
(c) Three (d) Four
(e) More than four

108. Which of the following statements is true regarding H?
(a) The one who is second to the right of H is a female.
(b) H is facing the centre.
(c) H is a male.
(d) The immediate neighbours of H are facing outside.
(e) None is true

109. What is D's position with respect to G?
(a) Third to the left (b) Third to the right
(c) Second to the left (d) Second to the right
(e) None of these

Directions (Qs. 110-112): Four of the following five are alike in a certain way based on their seating positions in the above arrangement and hence form a group.

110. Which of the following does not belong to the group?
(a) BE (b) CG
(c) GA (d) DH
(e) AF

111. Which of the following does not belong to the group?
(a) B (b) F
(c) G (d) A
(e) D

112. If all the friends are asked to sit in an alphabetical order starting from A in an anti-clockwise direction, the positions of how many will remain unchanged (excluding A)?
(a) Four (b) Three
(c) Two (d) One
(e) None

ANSWER KEY

1	(c)	14	(c)	27	(d)	40	(b)	53	(c)	66	(a)	79	(e)	92	(d)	105	(a)
2	(d)	15	(e)	28	(c)	41	(a)	54	(b)	67	(a)	80	(b)	93	(d)	106	(c)
3	(d)	16	(d)	29	(c)	42	(d)	55	(d)	68	(b)	81	(e)	94	(e)	107	(b)
4	(c)	17	(c)	30	(c)	43	(b)	56	(e)	69	(d)	82	(c)	95	(a)	108	(a)
5	(b)	18	(a)	31	(d)	44	(c)	57	(a)	70	(d)	83	(d)	96	(b)	109	(b)
6	(a)	19	(e)	32	(b)	45	(e)	58	(d)	71	(c)	84	(b)	97	(d)	110	(C)
7	(c)	20	(b)	33	(c)	46	(a)	59	(c)	72	(d)	85	(d)	98	(c)	111	(d)
8	(b)	21	(b)	34	(a)	47	(b)	60	(b)	73	(a)	86	(b)	99	(e)	112	(d)
9	(d)	22	(d)	35	(e)	48	(c)	61	(e)	74	(e)	87	(c)	100	(a)		
10	(b)	23	(c)	36	(a)	49	(d)	62	(b)	75	(a)	88	(c)	101	(a)		
11	(d)	24	(b)	37	(d)	50	(c)	63	(a)	76	(b)	89	(a)	102	(d)		
12	(e)	25	(a)	38	(c)	51	(b)	64	(d)	77	(a)	90	(c)	103	(c)		
13	(e)	26	(c)	39	(e)	52	(d)	65	(b)	78	(a)	91	(e)	104	(c)		

Hints & Explanations

1-5: Here, the persons who travel are: A, B, C, D, E, F, and G. Stations are: Base station, #I, #II, #III, #IV, and #V. Let us proceed with the following information: (1), (4), (5), (6), (9), (8), and (10).

These information give us the following table:

Station	Get in	Get down
Base station	– – –	× × ×
# I		× × ×
# II	× × ×	
# III	Only G	B, D
# IV	A	Only E
# V	× × ×	A, G, C

Now, from clue (2), F gets down at # II. And he got in either at base station or at # I.

Now, since F got down at #II and he had got in with C, it implies that both C and F got in either at base station or at # I.

Again, since B and D get down at # III this implies that they too got in either at base station or at # I.

It is given that E got in with two other persons i.e., in a group of three persons. Obviously, **E got in at base station. Hence, once again the above information can be summarised as :**

Station	Get in	Get down
Base station	E and (C, F) or (B, D)	× × ×
# I	(C,F) or (B, D)	× × ×
# II	× × ×	Only F
# III	Only G	B, D
# IV	A	Only E
# V	× × ×	A, G, C

1. (c) 2. (d) 3. (d) 4. (c) 5. (b)

6-10: Here the persons are *P, Q, R, S, T, V* and *W* and the vehicles are I, II and III. If there are at least two passengers in each vehicle and one of them is a male then, in the group there are as least three males.

Among them **R is a female** and she is a doctor. **P and V are also females.** From clue (ii) we get *W* is a teacher. And **Q is a male** and ' he is an engineer. He travels with only *W*. This implies ***W* is a female.** And both of them travel in vehicle I. From clue (iii), ***S* is a male** and he is a doctor. From clue (*v*), P is not an engineer (and she can 't be a doctor because there are only two doctors *R* and *S*). Hence, *P* is a teacher and she travels in vehicle II.

Now, see the bold parts. It says that there are four females *R, P, V* and *W*. Hence the remaining persons must be males because in each vehicle there is at least one male. Hence, ***T* is a male.** This implies that *S* and *T* will occupy seats in two different vehicles (II and III) because in vehicle I. Q travels with only *W*.

Again since, *R* can travel neither with *S* (see clue iv) nor with *P* and *V* (see clue i). Thus, we get their sitting arrangement as follows:

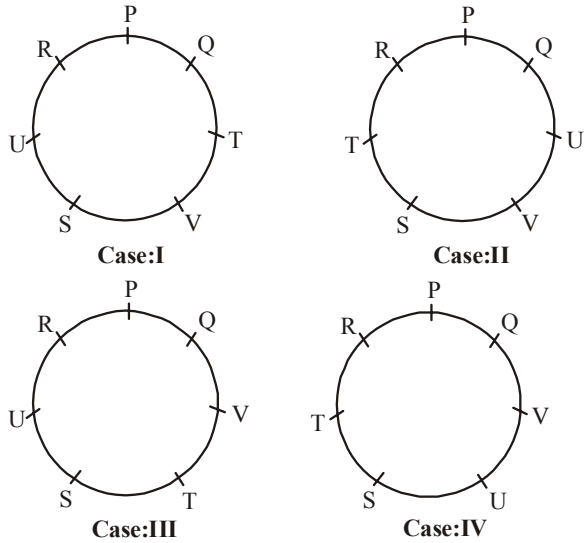
Vehicle	Person
I.	*Q, W*
II.	*P,S,V*
III.	*T, R*

Thus the obtained information can be summarised as below:

Person	Profession	Vehicle	Sex
Q	Engineer	I	Male
W	Teacher	I	Female
P	Teacher	II	Female
S	Doctor	II	Male
V	Engineer	II	Female
T	Teacher	III	Male
R	Doctor	III	Female

6. (a) 7. (c) 8. (b) 9. (d) 10. (b)

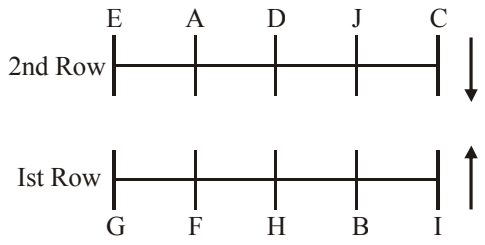
11-15: These are the probable cases of the sitting arrangements of P, Q, R, S, T, U and V:



11. (d) We can't say (iii) to be wrong because case III (as mentioned above) makes the statement true. While case I and case II makes the statement wrong. Since, we are not certain about the positions of U, V and T. Thus, only (i) and (ii) are wrong.

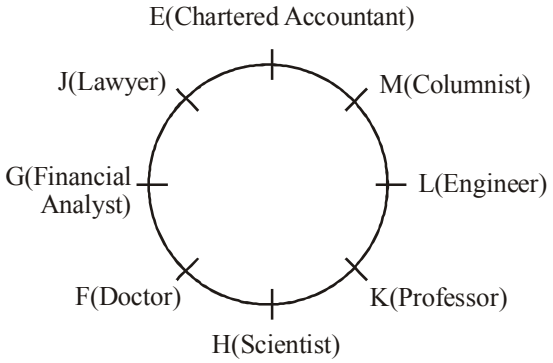
12. (e) 13. (e) 14. (c) 15. (e)

(16-20) :



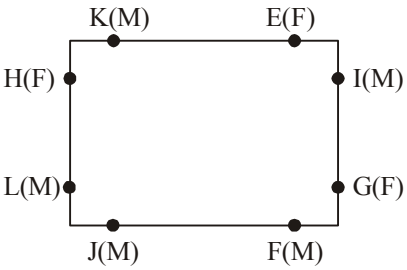
16. (d) 17. (c) 18. (a) 19. (e) 20. (b)

(21-25):



21. (b) 22. (d) 23. (c) 24. (b) 25. (a)

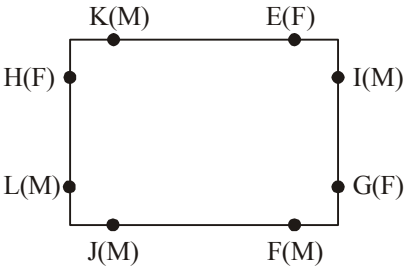
26. (c)



Here M = male
F = female

J is to the immediate left of F.

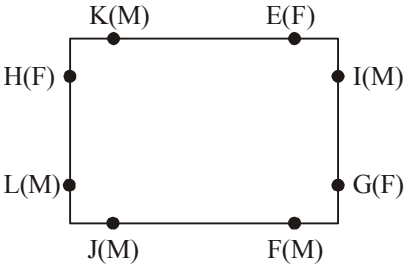
27. (d)



Here M = male
F = female

Both are male.

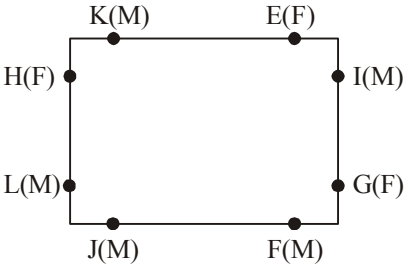
28. (c)



Here M = male
F = female

Three persons are seated between K and F (H, L and J) or E, I and G.

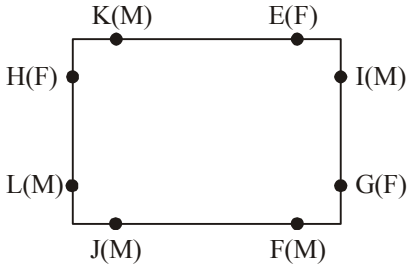
29. (c)



Here M = male
F = female

The three lady members are E, H and G.

30. (c)



Here M = male
F = female

K is seated between E and H.

(31-35)

Student	State	Branch
R	Delhi	Chem, Electrical (×)
T	Mumbai, Hyder (×)	Mech
Q	Calcutta	Electrical
	Chennai	Electronics
S	Mumbai	
P		Metallurgy

The following bold letters can be filled easily with the given information.

R	Delhi	**Civil**
T	**Bangalore**	Mechanical
Q	Calcutta	Electrical
U	Chennai	Electronics
S	Mumbai	**Chemical**
P	**Hyderabad**	Metallurgy

31. (d) 32. (b) 33. (c) 34. (a) 35. (e)

(36-40):

N, S —Account/Administration ... (i)
Q(–)— Administration – I/III ...(ii)
S works on Ist floor.
M works on IIIrd floor.
S and M work in the same department ...(iii)
P(+) – Ist floor
As only two persons work on each floor, Q and M work on IIIrd floor. And N and T work on IInd floor. As notwo females work on the same floor, M is a male. Similarly, S is a female. From (i) and (iii), it is clear that N, S and M work in the same department. And as no two females work in the same department, N is a male and T is a female.
As Q works in Administration, S works in Accounts with N and M.
Now, it is clear that T works in personnel. Now, the table will look as:

Person	Sex	Floor	Department
P	Male	I	Personnel/ Administration
S	Female	I	Accounts
N	Male	II	Accounts
T	Female	II	Personnel
Q	Female	III	Administration
M	Male	III	Accounts

36. (a) 37. (d) 38. (c) 39. (e) N and T
40. (b)

41-45: Let us proceed with the following chart:

Days	Person	Specialisation
Tuesday	—	—
Wednesday	—	—
Friday	—	—
Saturday	—	—

From clue (i), we get that the two persons who visit on Friday are P and the person who is Radiologist. Fill the above information in the chart.
Now, from clue (iii), we get that F is Oncologist and he visits alone on Tuesday.
Again, from clue (vii), we get that Neurologist visits on Friday. This implies that **P is Neurologist.**
Now, from clues (iv) and (v), we get M and K visit on Wednesday. Again, from clue (vi), we get Paediatrician visits with ENT specialist. This implies that they visit either on Wednesday or on Saturday. Again, from clue (ii), the Paediatrician does not visit on Saturday.
Therefore, Paediatrician and ENT specialist visit on Wednesday.
Now, using clue (iv), we get that **M is ENT specialist** whereas **K is the Paediatrician.** Again, from clue (v), we get that H is not Radiologist. This implies H does not visit on Friday. Hence, **H visits on Saturday.** Similarly, from clue (viii), we get that **B also visits on Saturday.**
Now, look at the chart. What do you observe? the only person left is D. Obviously, **D is the Radiologist.**
Now, use clue (viii). *Since* B is not in Orthopaedics, **H is in Orthopaedics and B is Ophthalmologist.**
Thus the whole information can be summarised as:

Tuesday:	F(Oncologist)
Wednesday:	M(ENT Specialist), K(Paediatrician)
Friday:	P(Neurologist), D(Radiologist)
Saturday:	H(Orthopaedician), B(Ophthalmologist)

41. (a) 42. (d) 43. (b) 44. (c)
45. (e) Neurology

(46-49):

Wednesday	Thusday	Friday	Saturday	Sunday	Monday	Tuesday
F, B	H, E	I, D	C	Holiday	A, G	J

46. (a) 47. (b) 48. (c) 49. (d)

50-53: We have been given that A and G sit on bench I and III respectively.
Now, since F is a boy and sits with only B, this implies B is a female (because there is at least one girl on each bench). F and B sit on bench II.
On the basis of above information we get

Bench I.	**A**	–
Bench II.	**F(+)**	**B (–)**
Bench III.	**G**	–

(+) indicates male; (–) indicates female.

Now, since C (a girl student) does not sit with A, E and D, it implies that C sits on bench III (because on bench II only two persons sit). By elimination E and D sit on bench I.
Now, See the clue, "A sits with **his** best friend". The pronoun `his' implies that A is a male. Again E is the brother of C implies that E is a male. By elimination D is a female. But sex of G is still not known.
Thus the information obtained above can be summarised as follows.

Bench I:	**A (+)**	**D (–)**	**E (+)**
Bench II:	**F (+)**	**B (–)**	
Bench III:	**G**	**C (–)**	

(+) indicates male; (–) indicate female.

50. (c) D, B, C are girls. Possibility of fourth girl still exists because sex of G is not known.
51. (b) 52. (d) 53. (c)

(54 –56) :

Person	Posts	Days
F	Manager	Monday
B	Supervisor	**Saturday**
D	Technician	Thursday
C	Officer	Wednesday
E	Clerk	Tuesday
A	Sales executive	**Friday**

54. (b) 55. (d) 56. (e)

(57 – 60) : From (ii) :

P T
Q Q
T P
P U
S S
U P

From the last sentence of (ii), only one possibility remains:

R
T
Q
P
S
U

Now, using (iii) and the above derived result:

R	C
T	E/B
Q	A
P	F
S	B/E
U	D

57. (a) 58. (d) 59. (c) 60. (b)

(61 – 63) :

	Subject	**Sl. No.**
From (ii) :	Zoology	1/6
		Chemistry 1/6
From (iii) :	Physics	*X*
		Botany *X*+1
From (v): *X*=3		
		Chemistry *Y*
		Maths *Y*+1

Now, it is clear that the lecture of Chemistry is not to be organised at the end. Hence, from (II), Chemistry–1 and Zoology–6. Hence, the arrangement will be : Chemistry–1, Maths –2, Physics –3, (break), Botany–4, Statistics–5, Zoology –6.

61. (e) 62. (b) 63. (a)

64 – 66 : From the definite informations, we get the following table (say **Table I**):

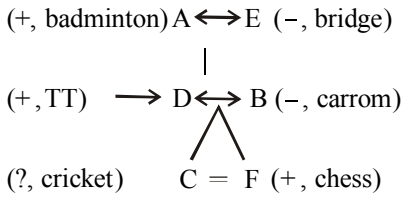
Student	Subject	Author
	Phy	Gupta
Mihir		Edwin
Neena	Maths	
Vinay	Eng	
	Bio	D'Souza

Now, since Phy is not owned by Sujit, it must be owned by Randhir. The remaining pairs are **Mihir-Chem** and **Sujit Bio**. Again. Eng-Khanna (x). Combining this information with the table above, we get **Maths-Khanna** and **Eng-Harish**. So the final table is :

Student	Subject	Author
Randhir	Phy	Gupta
Mihir	Chem	Edwin
Neena	Maths	Khanna
Vinay	Eng	Harish
Sujit	Bio	D'Souza

64. (d) 65. (b) 66. (a)

67 - 70



67. (a) 68. (b) 69. (d)

70. (d) Gender of C is not known.

(71-74) : Two B-type and two D-type cards are inserted in red envelopes. Since there are five red envelopes, so only one E-type card is put in red envelope. The two remaining E-type cards and one D-type card are thus put in brown envelopes. The remaining two cards in brown envelopes are C-type. The yellow envelopes thus contain one B-type, one C-type and three A-type cards.

Envelope	Cards				
Red	B	B	D	D	E
Yellow	A	A	A	B	C
Brown	C	C	D	E	E

71. (c) 72. (d) 73. (a)

74. (e) Brown-2, Red-1

75-78 : Let us first proceed with the definite informations in (iv) and (v). We get the following table (say Table 1:

Card	Colour	Picture	Position
A	Brown	Queen	6
B		Prince	
C	Grey	King	2
D			
E			
F			

Note: The cards have been assigned position I to 6 from left to right.

Let us summarise the remaining information:

Palace - Blue - D (×) .....(i)

Princess - D, E (×) .....(ii)

Princess - Green, Yellow (×) ... (iii)

B-2 or 4 ... (iv)

From (i), (iii) and Table 1, we get

Princess - Red ... (v)

Again, from (ii), (v) and Table 1, we get

Princess - Red - F ... (vi)

From (i), (vi) and Table 1, we get

Palace - Blue - E ... (vii)

From (iv), (vi), (vii) and Table 1, and then filling up the remaining information, we get Table 2:

Card	Colour	Picture	Position
A	Brown	Queen	6
B	Green/Yellow	Prince	
C	Grey	King	2
D	Yellow/Green	Joker	
E	Blue	Palace	
F	Red	Princess	

75. (a) The vacant positions are 1, 3, 4 and 5. The given situation demands that three consecutive cards – 3, 4 and 5 – be assigned to these. So, Joker will be at No. I from left.

76. (b)

77. (a) Yellow or Green

78. (a)

79-80:

	Batting	Bowling
Pervez	2	3
Jatin	5	2
Robin	4	4
Dinkar	3	1
Rahul	1	5

79. (e) 80. (b)

(81 - 84) :

Tie	Company	Name
Blue	S	Hitesh
Green	P	Lokesh
Pink	Q	Ramesh
Purple	U	Shailesh
Yellow	R	Nilesh
Red	T	Dinesh

81. (e) 82. (c)

83. (d) 84. (b)

85-87 GFE ... (iii)

A ---------- E...(v)

C ---------- H... (vi)

1800 = 30T2

Now (v) and (vi) may be combined as

AC ---------- EH... (vii) (a)

or CA --------- HE... (vii) (b)

But (vii) (b) is ruled out because of statement (iv).

Combining (iii) and (vii) (a), we get

AC - - GFEH ... (viii)
Now, from (ii) and (viii), we get
ACB - GFEH ... (ix)
Now, the blank can be filled by 'D', hence the arrangement will be ACBDGFEH

85. (d) 86. (b) 87. (c)

(88-90):

Lecturers	Courses	Month	
P	B	Jan/Feb/Mar	... (ii)
Q	A	Mar	(iii)
R	A/B/E	Jan	(iv)

Now, from the table it is clear that P will teach in February and 'R' will definitely teach the course E. Hence the table can be made as,

Lecturers	Course	Month
P	B	Feb
Q	A	Mar
R	E	Jan
S	C/D	Apr/May
T	D/C	May/Apr

88. (c) 89. (a) 90. (c)

(91-93):

Programme	its order	Performer
song1	B*(x)*	..... (i)
dance	6	..... (ii)
mimicry	$x = 3$	C..... (iii)
speech	$(x - 1) = 2$	A(x) ..... (iv)
drama	5	E ..... (v)

[order can be determined with the help of II]

6	D/F(x)	..... (vi)
4		D ..... (vii)

'$x = 3$' is known by the secondlast line of the given information:

story telling	4	D
drama	5	E
mimicry	3	C
speech	2	B/F
song	1	A/F
dance	6	A/B

91. (e) 92. (d) 93. (d)

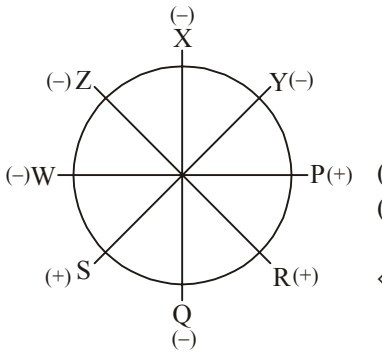
94 - 98

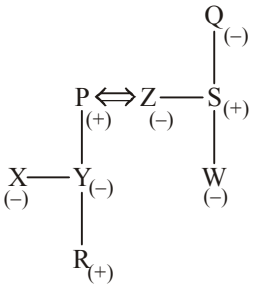
Day	Date	Play
Monday	25	A
Tuesday	26	Z
Wednesday	27	B
Thursday	28	No play
Friday	29	M
Saturday	30	Q
Sunday	31	X

94. (e) 95. (a) 96. (b) 97. (d) 98. (c)

(99-105)

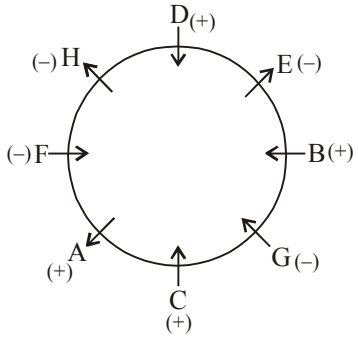
P, Q, R, S, W, X , Y, Z





99. (e) 100. (a) 101. (a) 102. (d)
103. (c) 104. (c) 105. (a)

Sol: (106-112)



106. (c)
107. (b)
108. (a)
109. (b)
110. (c)
111. (d)
112. (d) Circular Rearrangement