LOGICAL REASONING AND DATA INTERPRETATION

From Confusion to Clarity — One Set at a Time.

800+
Questions

Key Features

- Detailed Explanation Of Concepts
- Level-wise Practice exercises
- Solved Examples
- Important PYQs

By **Gourav Gupta**

Ideal for CAT, XAT, SNAP, NMAT & Other Management exams

CONTENTS

1 ARRANGEMENTS: LINEAR & NON-LINEAR

THEORY

Arrangements

Understanding of 'Arrangements' is one of the most important aspects for any aspirant at the beginning of Logical Reasoning. Be it CAT or OMETs, having proper control over the different statements that you will encounter in this chapter will give you a better understanding of some other topics, directly or indirectly.

A correct interpretation of the statements (as mentioned above) becomes very important from the contextual point of view of every different question. Here, the same statement may have different meanings in two different questions. Also, different statements may have the same interpretation as well. So, it is very important for you to go through every statement that is mentioned and understand the correct or most appropriate interpretation as per the given situation.

These differences may occur based on the type of arrangement – Linear or Circular.

Linear Arrangements

In linear arrangements, the first important thing is to select the LEFT and RIGHT. It will totally depend on the direction the person is facing. Direction in this context doesn't mean North, South, West, or East. In fact, if it is given in the question that 8 people are sitting in a row with everyone facing North or everyone facing East or whatever, you will always consider that they are facing inward (inside the notebook). The benefit of doing so will be avoiding the confusion in the sense that now your left will be the person's left who is sitting in the given row, and your right will be that person's right.

Below you will find different statements with their interpretations.

For each statement, consider that 10 people are sitting in a row facing the same direction. Also, treat each statement individually until stated otherwise.

Statement-01: A is sitting at the extreme right end of the row.

Or

Nobody is sitting to the right of A.

Statement-02: A is sitting in the 4th place from the right

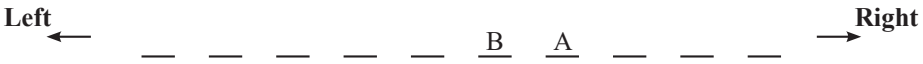
Statement-03: A is sitting in the 4th place starting from right, and B is sitting adjacent to A.

Or

A is sitting in the 4th place from the right, and B is sitting next to A

Or

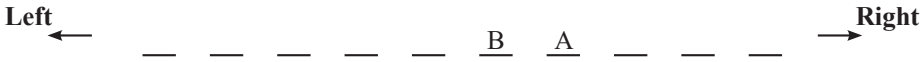
A is sitting in the 4th place from the right, and B is the immediate neighbour of A.



Or

Statement-04: A is sitting in the 4th place starting from right, and B is sitting to the left of A.

Statement-05: A is sitting in the 4th place starting from right, and B is sitting on the immediate left of A.



Statement-06: A is sitting in the 4th place from the right, and B is sitting 3 places away from A.

Or

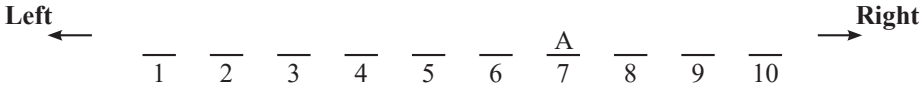
A is sitting in the 4th place from the right, and there are 2 people between A and B.

Or

Statement-07: A is sitting in the 4th place starting from right, and B is sitting 4 places to the left of A.

Statement-08: A is sitting in the 4th place starting from the right. C is sitting between A and B.

There can be multiple arrangements (as explained below) for the above statement, as you must understand that there can be any number of people sitting between A and B, and C is not the only person sitting between A and B.



A sits on Chair 7.

If B sits on 1, C may sit anywhere from 2 to 6.

If B sits on 2, C may sit anywhere from 3 to 6.

If B sits on 3, C may sit anywhere from 4 to 6.

If B sits on 4, C may sit anywhere from 5 to 6.

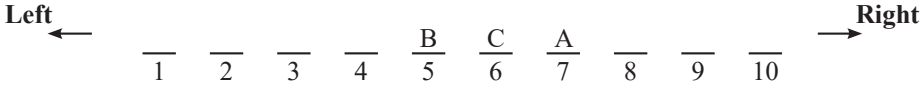
If B sits on 5, C will sit at 6.

If B sits on 10, C may sit anywhere from 8 to 9.

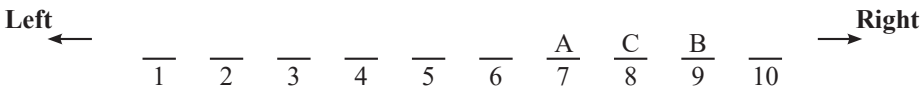
If B sits on 9, C will sit at 8.

Hence, from the above possibilities, we may interpret that C cannot sit at 1 or 10, and B cannot sit at 6 or 8.

Statement-09: A is sitting in the 4th place starting from right. Only C is sitting between A and B.



Or



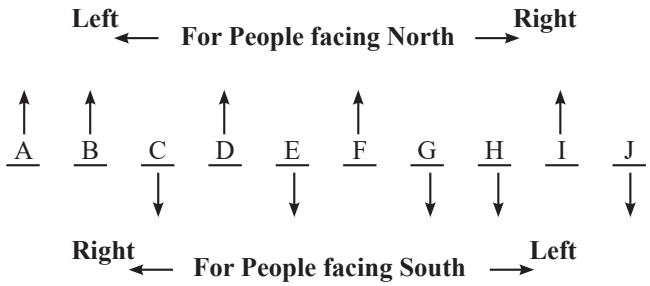
Different Types of Linear Arrangements

Type-1

When everyone is sitting in a single row facing the same direction.

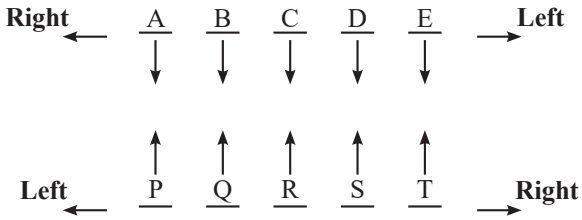
Type-2

When everyone is sitting in a single row, some are facing North and others are facing South.



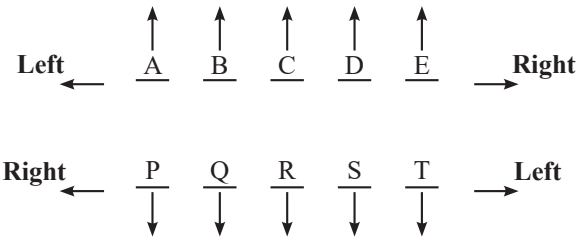
Type-3

When sitting in 2 different rows, with every person facing someone else in the other row.



Type-4

When sitting in 2 different rows with the backs towards each other.



Circular Arrangements

Here again, it's important to understand LEFT and RIGHT of a person, which will be in either clockwise or anticlockwise directions for the person sitting around the circular table, depending upon whether they are facing towards or away from the centre of the table.

Also, in circular arrangements, you may start arranging people by placing any one person at any position and then arranging others with respect to this person based on the conditions given in the question.

Some of the statements used in Linear Arrangements may have different interpretations in circular arrangements, as given below.

1. In Linear Arrangements, **B is sitting to the left of A** would mean that B may sit anywhere to the left of A, but in circular arrangements, it would mean that B will be immediately to the left of A.
2. In Linear Arrangements, **C is sitting between A and B**, would means that there can be any number of persons between A and B, and C is one of those who are sitting between A and B. But in circular arrangements, the statement would mean that C is the only person sitting between A and B.

Different Types of Circular Arrangements

Type-1: Every person is facing towards the centre of the table

Left will be in the clockwise direction and the right will be in an anti-clockwise direction, as shown in the figure below.

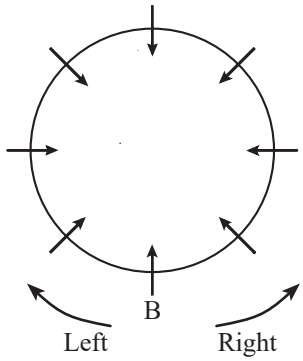


Illustration: 8 freinds, P, Q, R, S, T, U, V and W, are sitting in a circle facing the centre.

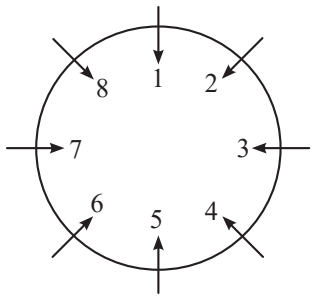
I. T sits opposite P.

II. Q sits to the immediate left of T, who sits to the immediate left of W.

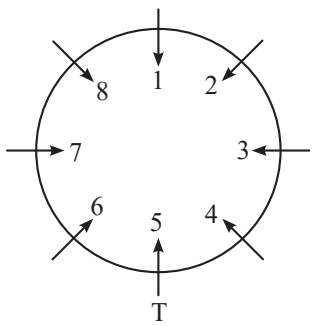
III. S sits to the immediate right of P and to the immediate left of V.

IV. R never sits opposite Q.

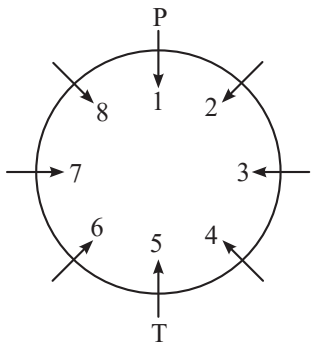
Sol. First, we will mark 8 positions for 8 friends sitting around a circular table facing the center. For better understanding, we have numbered the positions.



Now, we will start the arrangement by placing one person (let's say T) at any of the positions (say position 5).



P will now sit at position 1 using 1st statement.



SOLVED EXAMPLES

Directions (1-5): Read the following passage and answer the given questions.

Ten individuals - O, P, Q, R, S, T, U, V, W, and X—are positioned in a straight line, all facing north, though not necessarily in this exact order.

1. No two persons whose names are consecutive in the alphabetical sequence stand next to each other.
2. At most, one person is positioned to the left of S.
3. The number of individuals to the right of S is equal to the number of individuals to the left of V.
4. T is positioned immediately to the right of P.
5. The count of persons between S and P is one more than the count of persons between U and R.
6. Exactly one person stands between Q and W.
7. S, T, U, and V are seated in this order, with the number of persons between each consecutive pair consistently decreasing.

1. How many persons stand between Q and T?

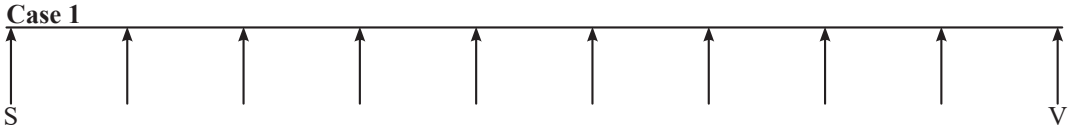
(*a*) 1 (*b*) 2 (*c*) 3 (*d*) More than 3

Sol. From point 1: P is not next to both O and Q; Q is not next to both P and R and so on…

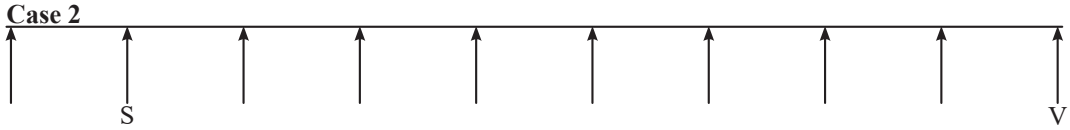
From point 2: There will be two cases i.e., S is at the leftmost or second-left position.

From point 3: V will be in a symmetric right end position as per S's left end position.

Case 1

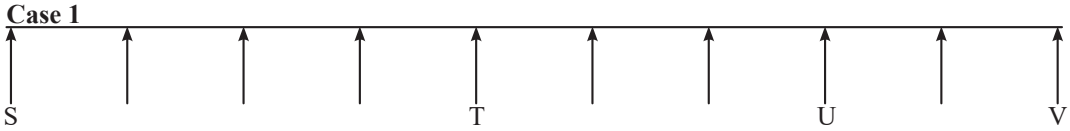


Case 2

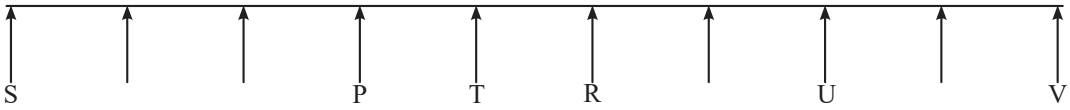


From point 7: only Case 1 is satisfied.

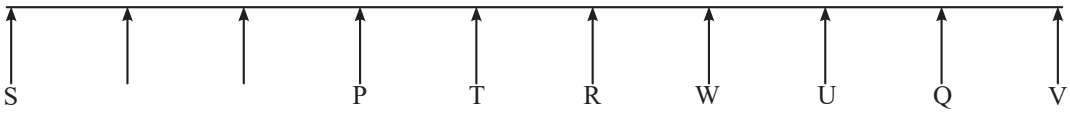
Case 1



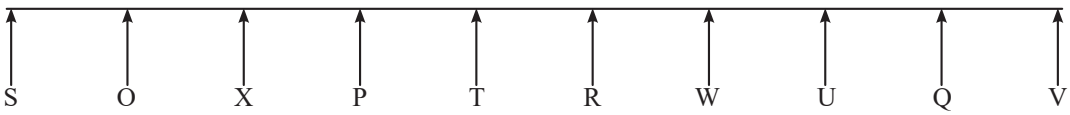
From points 4 and 5:



From point 6:



Below is the final arrangement:



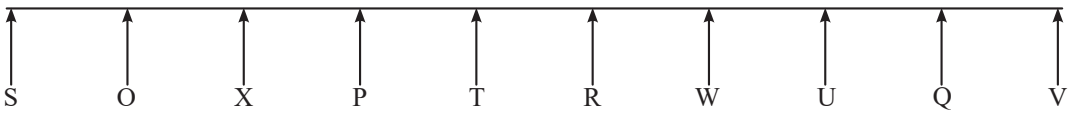
There are exactly 3-persons between Q and T.

2. Who is positioned immediately to the right of P?

(*a*) W (*b*) V

(*c*) The one who stands third to the left of U (*d*) None of these

Sol.

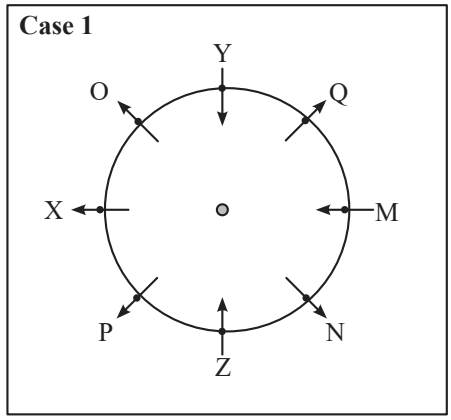


T (who stands third to the left of U) is positioned immediately to the right of P.

24. If P is related to Y and M is related to O in a certain way, then who among the following is related to Z?

(*a*) X (*b*) P (*c*) M (*d*) Q

Sol. The final arrangement is like below:



P is 3rd to the right of Y;

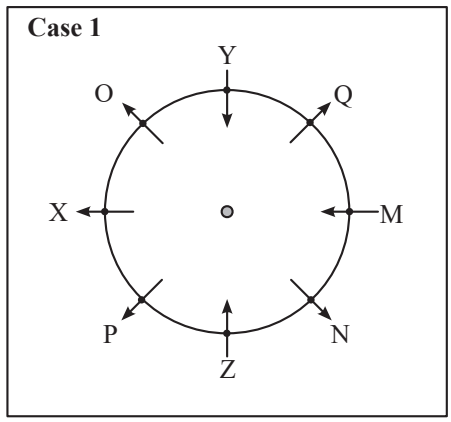
M is 3rd to the right of O.

Similarly, Q is 3rd to the right of Z.

25. How many people are seated between M and P when counting from P's right?

(*a*) 4 (*b*) 2 (*c*) 3 (*d*) Cannot be determined

Sol. The final arrangement is like below:



There are four persons (X, O, Y, and Q) seated between M and P when counted from the right of P.

DIFFICULTY LEVEL - 01 (EASY)

Directions (1-5): Read the following passage and answer the given questions.

Eight people are seated in a linear row facing north. Anil is seated fourth to the left of Radha. Radha is not seated at the end of the row. Jaggu is an immediate neighbour of Anil. Two people are seated between Parul and Jaggu. Anil is seated to the left of Parul. Nisha is seated to the immediate left of Ekta. Shyam is seated to the left of Manju.

1. How many people are seated to the left of Parul?

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

2. The number of people seated between Radha and Ekta is the same as the number of people seated between _____ Parul.

(*a*) Shyam (*b*) Anil (*c*) Jaggu (*d*) Nisha

3. The number of people seated to the left of Shyam is the same as the number of people seated to the right of

(*a*) Nisha (*b*) Parul (*c*) Radha (*d*) Jaggu

4. Which of these statements is true?

(*a*) Jaggu is seated at the left end of the row (*b*) Four people are seated between Shyam and Ekta

(*c*) Parul is an immediate neighbor of Manju (*d*) All of these

18. If Mehta is first in the queue then which of the following is false?

(*a*) There is one person between Mehta and Dhawan. (*b*) Singh and Yadav are standing together.

(*c*) Ganpat and Yadav are standing together. (*d*) There are three people between Mehta and Sharma.

19. Who is standing last in the queue?

(*a*) Mehta (*b*) Yadav (*c*) Singh (*d*) Cannot Determine

20. Which of the following statement(s) is/are TRUE for Sharma?

I. There are two people between him and Dhawan. II. He is ahead of Mehta.

III. He is standing with Singh

(*a*) Only I and II (*b*) Only III (*c*) Only II (*d*) Only II and III

Directions (21-25): Read the following passage and answer the given questions.

Eight dishes viz. Curry, Chaat, Fries, Kofta, Nachos, Pie, Roll, and Salad are kept around a square-shaped table facing inward. One dish is kept at one corner each and one dish is kept at the middle of one side each. Chaat is kept immediately to the left of the Salad. Only two dishes are kept between Kofta and Nachos which is not kept adjacent to Salad. Only two dishes are kept between Curry and Roll which is kept at the corner. Chaat and Kofta are kept adjacent to each other. The pie is not kept at the corner. Salad is kept third to the right of Curry.

21. Which dish is kept opposite to Curry?

(*a*) Pie (*b*) Salad (*c*) Curry (*d*) Roll

22. Select the odd one out.

(*a*) Salad (*b*) Roll (*c*) Kofta (*d*) Curry

23. Which dish is kept sixth to the left of Nachos?

(*a*) Curry (*b*) Pie (*c*) Fries (*d*) Kofta

24. Which of the following dish is kept adjacent to Pie?

(*a*) Nachos (*b*) Salad (*c*) Curry (*d*) Kofta

25. What is kept between Nachos and Curry?

(*a*) Pie (*b*) Kofta (*c*) Fries (*d*) Roll

ANSWER KEY

1. (*c*)	**2.** (*b*)	**3.** (*c*)	**4.** (*d*)	**5.** (*b*)	**6.** (*a*)	**7.** (*b*)	**8.** (*d*)	**9.** (*b*)	**10.** (*d*)
11. [4]	**12.** (*a*)	**13.** (*b*)	**14.** (*c*)	**15.** (*d*)	**16.** (*d*)	**17.** (*c*)	**18.** (*c*)	**19.** (*d*)	**20.** (*b*)
21. (*a*)	**22.** (*d*)	**23.** (*a*)	**24.** (*b*)	**25.** (*c*)					

HINTS & SOLUTIONS

1. (*c*) Anil is seated fourth to the left of Radha. Radha is not seated at the end of the row.

Case 1:

		Anil				Radha	

Case 2:

	Anil				Radha		

Case 3:

Anil				Radha			

Jaggu is an immediate neighbour of Anil. Two people are seated between Parul and Jaggu. Anil is seated to the left of Parul.

So, Case 3 is invalid.

Case 1:

	Jaggu	Anil		Parul		Radha	

Case 2:

Jaggu	Anil		Parul		Radha		

Nisha is seated to the immediate left of Ekta. So, Case 1 is invalid.

Shyam is seated to the left of Manju.

Case 2: This is the final arrangement.

Jaggu	Anil	Shyam	Parul	Manju	Radha	Nisha	Ekta

3 people are seated to the left of Parul.

2. (*b*) This is the final arrangement.

Jaggu	Anil	Shyam	Parul	Manju	Radha	Nisha	Ekta

The number of people seated between Radha and Ekta is the same as the number of people seated between Anil and Parul.

3. (*c*) This is the final arrangement.

Jaggu	Anil	Shyam	Parul	Manju	Radha	Nisha	Ekta

The number of people seated to the left of Shyam is the same as the number of people seated to the right of Radha.

4. (*d*) This is the final arrangement.

Jaggu	Anil	Shyam	Parul	Manju	Radha	Nisha	Ekta

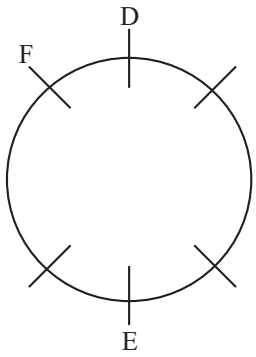
All the given statements are true.

5. (*b*) This is the final arrangement.

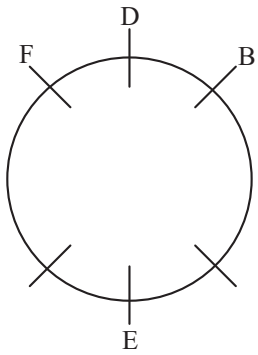
Jaggu	Anil	Shyam	Parul	Manju	Radha	Nisha	Ekta

Nisha is seated third to the right of Parul.

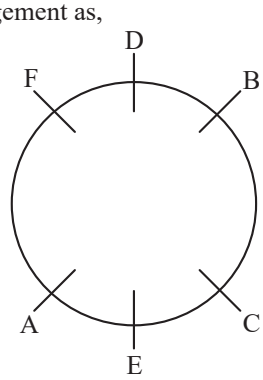
6. (*a*) For convenience we take the first letter of the name of the persons as A, B, C, D, E and F.
By using condition 1 and 2 we can say that,



Now by using condition (4) we get,



Now by using condition 3 we get the final arrangement as,



From the final arrangement we can say that, B sits opposite to A.

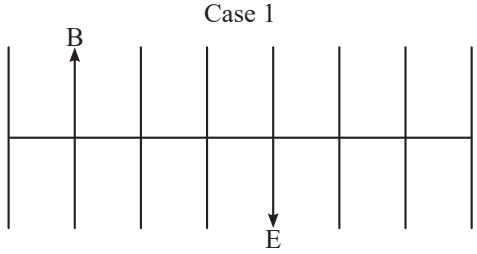
ANSWER KEY

1. (*b*)	**2.** [4]	**3.** (*c*)	**4.** (*d*)	**5.** (*d*)	**6.** (*c*)	**7.** (*c*)	**8.** (*d*)	**9.** (*b*)	**10.** (*d*)
11. [24]	**12.** (*a*)	**13.** [17]	**14.** (*d*)	**15.** (*c*)	**16.** (*b*)	**17.** [6]	**18.** (*d*)	**19.** (*c*)	**20.** (*a*)
21. (*d*)	**22.** (*c*)	**23.** (*c*)	**24.** (*d*)	**25.** (*b*)					

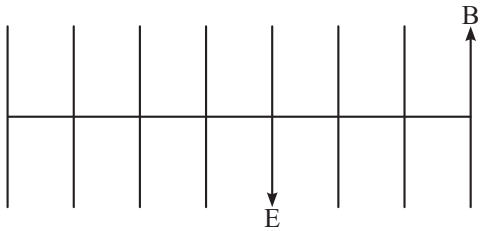
HINTS & SOLUTIONS

1. (*b*) E is facing South. Three people are seated to the left of E. There are two people sitting between E and B.

Case 1

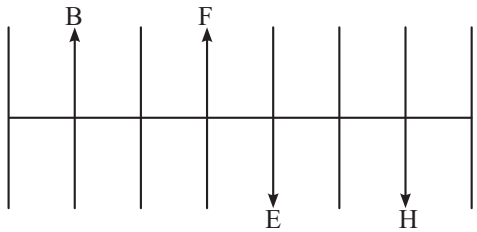


Case 2

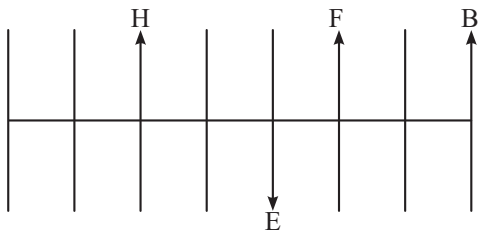


H does not sit at either end of the row. F is sitting third to the right of H. H is an immediate neighbor of neither E nor B.

Case 1

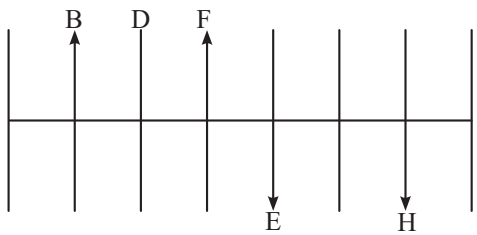


Case 2



D is not an immediate neighbor of H. Both immediate neighbors of D are facing North. Thus, we can say that D is not sitting at the end.

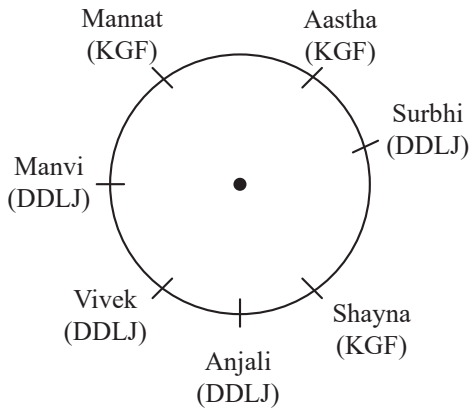
Case 1



From statement 4 and 6:

Vivek must like DDLJ

Therefore, Mannat likes KGF and Surbhi likes DDLJ.



DIFFICULTY LEVEL - 03 (HARD)

Directions (1-5): Read the following passage and answer the given questions.

During a two-day Navratri event, eight different lights — L, M, N, O, P, Q, R, and S — are installed around a circular stadium. Some of these lights face towards the stadium, while others face away from the stadium to illuminate the outer area.

Each light displays two different colours — one on each day — selected from Pink, Red, Blue, Orange, White, Green, Violet, and Yellow. No two lights display the same colour on the same day. The positions of the lights remain unchanged on both days.

The following clues are provided:

1. P, which displays Red on Day 1, is placed second to the left of R, who displays Blue on Day.

2. Also, P and R face in opposite directions.

3. P is placed next to the lights that display Blue and Orange colours on Day 1.

4. Q is immediately to the left of the light displaying Blue on Day 1. Also, Q is third to the right of O, who displays Yellow on Day 2.

5. The light displaying Pink on Day 1 is positioned second to the right of O, and O does not face the centre.

6. N and S are placed immediately to the right of each other. Neither N nor S is adjacent to R.

7. The light displaying Pink on Day 2 is positioned adjacent to S. Also, N displays Green on Day 2.

8. L displays White on one of the days, and M displays Red on one of the days. Additionally, M never displays Pink or Blue on either day.

9. N never displays Violet on any day.

10. The light displaying Green on Day 1 is positioned immediately to the right of the light displaying Yellow on Day 1.

11. S never displays Orange on any day.

1. Which of the following statement(s) is/are definitely false?

I. P displays Orange colour on Day 1 and Red colour on Day 2.

II. The colour displayed by Q on Day 1 is the same as the colour displayed by S on Day 2.

III. The light displaying Green on Day 1 faces the same direction as R.

IV. L is positioned immediately to the right of the light displaying Violet on Day 2.

(*a*) Only I (*b*) Only I, II, and IV (*c*) Only I and IV (*d*) Only III and IV

2. _____ displays _____colour on Day 2 and displays _____ colour on Day 1.

(*a*) P, Red, Orange (*b*) O, Green, Yellow (*c*) Q, Violet, Pink (*d*) R, Blue, Yellow

3. Which light displays the Orange colour on Day 2?

(*a*) The light which is opposite to light which displays White colour on Day 2.

(*b*) The light which is to the immedidate left of light which displays orange colour on Day 1.

(*c*) The light opposite to S

(*d*) The light which is to the immedidate right of L.

4. How many lights are facing towards the stadium?

(*a*) 3 (*b*) 2 (*c*) 4 (*d*) Cannot be determined

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ISBN 978-93-7153-596-0

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