SEATING ARRANGEMENTS

LEARNING OBJECTIVES

- To understand the Logical statements involved in the Seating Arrangements.
- To understand the types of Seating Arrangements.

  The process of making a group of people to sit as per a prefixed manner is called Seating Arrangement. In these of questions, some conditions are given on the basis of which students are required to arrange objects, either in a row or in a circular order.

INTRODUCTION

11.1 BASED ON VARIOUS PATTERN OF SITTING ARRANGEMENTS ARE CLASSIFIED INTO

1) Linear Arrangements
2) Circular Arrangements
3) Polygon Arrangements

Here we are limited to our topic linear and circular arrangements only. While making arrangements, it should be noted that all the conditions given are complied with. These type of questions generally involve five to eight individuals arranged in a certain manner or pre-conditions. They may have to be arranged in a circle or in a row accordingly.

Sometimes these questions are made more difficult by allowing an individual to a particular position with some conditions.

General instructions to Solve Seating Arrangement Questions are as follows.

1) First of all take a review on the given information. After performing this step, you would get an idea of the situation of people or objects.

2) Next, determine the usefulness of each information's and classify them accordingly into 'definite information', 'comparative information' and 'negative information'.

3) When the place of any objects or persons is definitely mentioned then we say that it is a definite information, X is sitting on the right end of the bench.

4) When the place of any object or person is not mentioned definitely but mentioned only in the comparison of another person or object, then we say that it is a comparative information.

   Example 1: A is sitting second to the right of E. This type of information can be helpful when we can get the definite information about E.

5) A part of definite information may consist of negative information. A negative information does not tell us anything definitely but it gives an idea to eliminate a possibility.

Example 2: C is not sitting on the immediate left of A.

11.2 TYPE-1 LINEAR ARRANGEMENT

In this type of arrangement, we arrange objects or persons in a line or row. The arrangement is done only on one 'axis' and hence, the position of persons or objects assumes importance in terms of order like positions. In this type of arrangement, we take directions according to our left and right.

Steps to Solve the Linear Arrangements:

(a) Identify the number of objects and their names.

(b) Use pictorial method to represent the people or objects and their positions.

(c) Arrange the information with relevant facts and their positions and try to find out the solution.

(d) Answer the questions based on the arrangement having made.

There are few words which must be paid adequate attention, i.e., 'between' means sandwiched, 'immediate left' is different from 'to the left'. To understand it let us see some pictorial representation.

When direction of face is not clear, then we take **One Row Sequence**

(A) When direction of face is not clear, then we take based on diagram will be as follows:
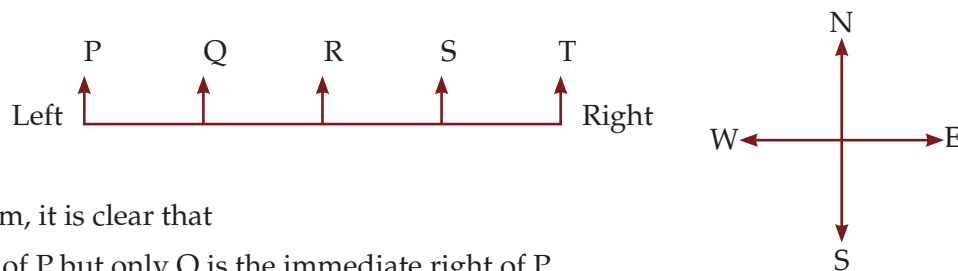
From the above diagram, it is clear that

(i)   Q, R, S, T are right of P but only Q is the immediate right of P.

(ii) S, R, Q, P are left of T but only S is the immediate left of T.

(iii) R, S, T are right of Q only R is the immediate right of Q.

(iv) R, Q, P are left of S but only R is the immediate left of S.

(v) S and T are right of R but only S is the immediate right of R.

(vi) Q and P are left of R but only Q is the immediate left of R.

(vii) P is the immediate left of Q while T is the immediate right of S.

(B) When direction of face is towards you, then the diagram will be as follows:
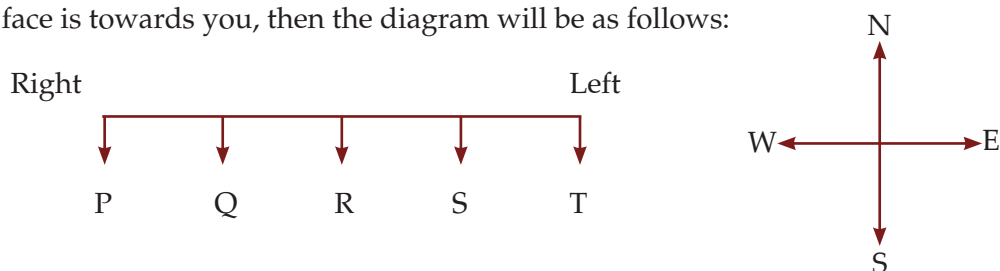
From the above diagram, it is clear that

(i) Left of P = Q, R, S and T

(ii) Right of T = S, R, Q and P

(iii) Q is immediate left of P; R is immediate left of Q; S is immediate left of R and T is immediate left of S.

(iv) S is immediate right of T; R is immediate right of S; Q is immediate right of R; and P is immediate right of Q.

Two Rows Sequence

Let us see 6 persons seating in two rows.
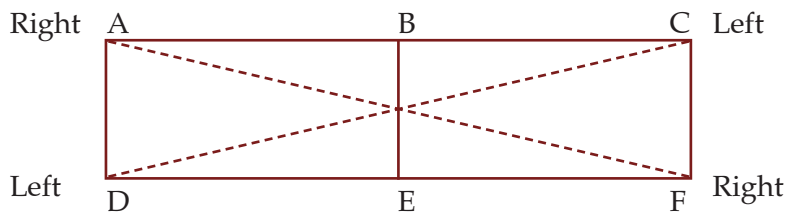
From the above diagram, it is clear that

(i) A is sitting opposite D

(ii) B is sitting opposite E

(iii) C is sitting opposite F

(iv) D and C are sitting at diagonally opposite positions

(iv) A and F are sitting at diagonally opposite positions.

Example 3: Four Children's are sitting in arrow. A is occupying seat next to B but not next to C. If C is not sitting next to D ? Who is occupying seat adjacent to D.

(a) B (b) B and A (c) Impossible to tell (d) A

Solution: (d) The arrangements as per given information is possible only if C is sitting next to B and D is sitting next to A.

Therefore, two possible arrangements are C, B, A, D, or D, A, B, C

Clearly, only A is sitting adjacent to D:

Example 4: P, Q, R, S, T, U, V and W are sitting in a row facing North.

(i) P is fourth to the right of T

(ii) W is fourth to the left of S

(iii) R and U, which are not at the ends, are neighbours of Q and T respectively.

(iv) W is next to the left of P and P is the neighbour of Q. Who are sitting at the extreme ends ?

Solution:

From information

(i) We get that there are three persons between P and TXXXP.

In the information (iv), it is given that W is next to the left of P and Q is the neighbour of P. Using the information with (i), we get TXXWPQ.

By the information (ii), TXXWPQXS

By the information (iii),

T   U   V   W   P   Q   R   S

So, T and S are sitting at the extreme ends.

Example 5: There are Five houses P, Q , R, S, T . P is immediate right of Q and T is immediate left of R and immediate right of P . Q is right of S. Which house in the middle.

(a) P   (b) Q   (c) R   (d) T

Solution: According to the question the houses can be arranged as follows. Assuming all houses are facing towards North.

S   Q   P   T   R

Therefore, house P is middle.

Example 6: Five friends are sitting on a bench. A is to the immediate left of B but on the immediate right of C, D is to the immediate right of B but on the immediate left of E. Who are at the extremes?

(a) A, B   (b) A, D   (c) C, E   (d) B, D

Solution: Arrangements according to the question as follows. Assuming all students are facing towards North.

Left   C   A   B   D   E   Right

Clearly C and E are the extremes.

Example 7: In a college party, 5 girls are sitting in a row. P is to the immediate left of M and to the immediate right of O. R is sitting to the immediate right of N but to the left of O. Who is sitting in the middle?

(a) O   (b) R   (c) P   (d) M

Solution: (a) arrangements of the question as follows.

Left   N   R   O   P   M   Right

Therefore, O is sitting in the middle.

Example 8: Five boys A, B, C, D and E are standing in a row. D is on the immediate right of E, B is on the immediate left of E but on the immediate right of A. D is one the immediate left of C, who is standing on the extreme right. Who is standing in the middle?

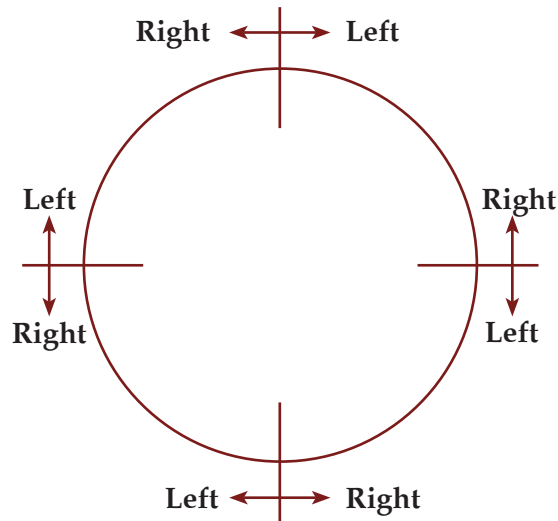(a) B   (b) C   (c) D   (d) E

Solution: The sequence of Boys as follows. Assuming all boys are sitting towards North.

Left End   A   B   E   D   C   Right

There E is standing in the middle.

Circular Arrangement:

In this arrangement, some persons are sitting around a circle and they are facing the centre.

1. Left movement is called clockwise rotation.

2. Right movement is called anti–clockwise rotation.

    (i) The above presentation is for 4 persons but for any number of persons, the direction is taken in the same manner.

    (ii) For rectangular and sequence arrangement, directions are taken as discussed in two rows sequence.

Example 9: (Q Nos. 1 to 3) **Study the following Question carefully and answer the given questions.**

Four ladies A, B, C and D and Four Gentlemen E, F, G and H are sitting in a circle around a table facing each other .

I.   No two ladies or gentlemen are sitting side by side.

II. C, who is sitting between G and E, is facing D.

III. F is between D and A and facing G.

IV. H is to the right of B.

(1) Who is sitting left of A?

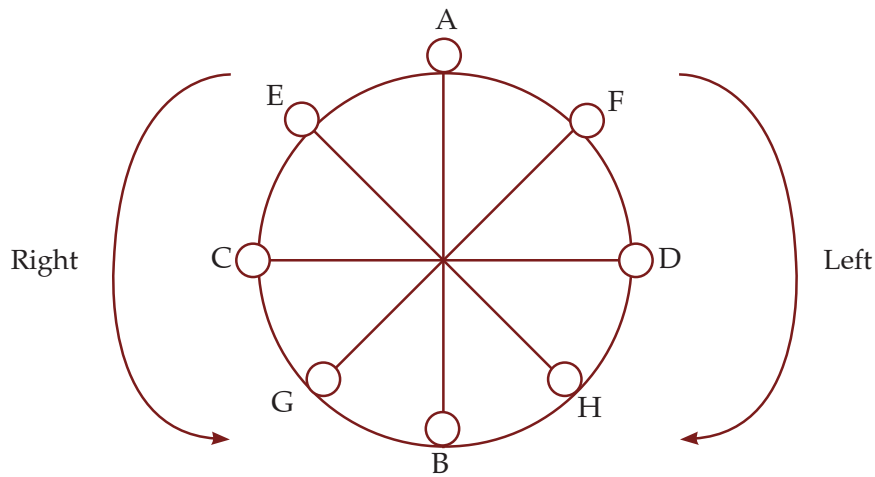   (a) E   (b) F   (c) G   (d) H

(2) E is facing whom?

    (a) F   (b) B   (c) G   (d) H

(3) Who is immediate neighbour of B?

    (a) G and H   (b) E and F   (c) E and H   (d) F and H

Solution: On the basis of given information in the question, the seating arrangements of the persons are as follows.
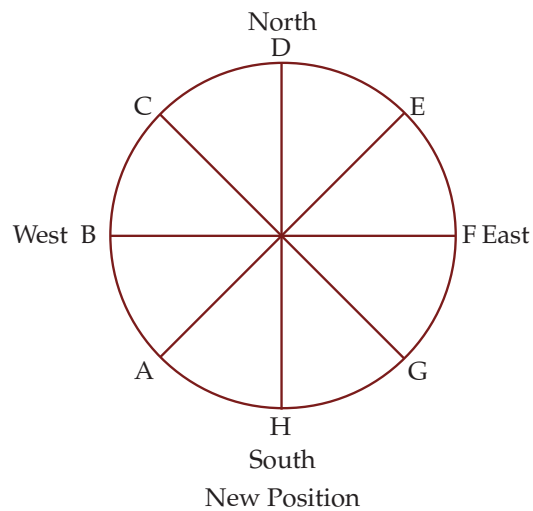
1) (b) Clearly , F is sitting left of A.

2) (d) Clearly E is facing H.

3) (a) G and H are neighbours of B.

Example 10: Eight persons A, B, C, D, E, F, G and H are sitting around the circle as given in the figure. They are facing the direction opposite to centre. If they move upto three places anti-clockwise, then.
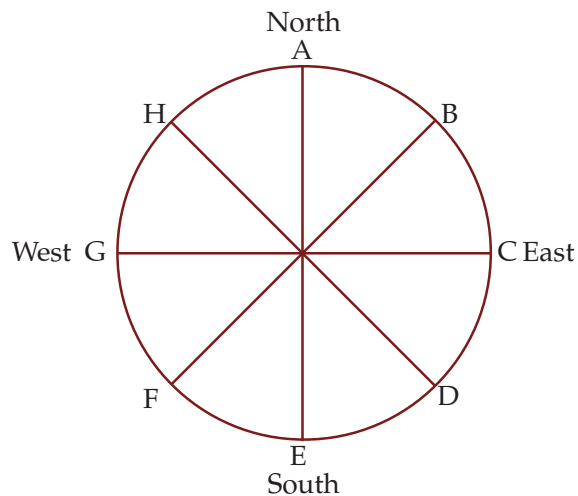
(a) B will face West

(b) E will face East

(c) H will face North-West

(d) A will face South

Solution: Following Seating arrangement is formed from the given in formation.

North
A

H   B

West G | CEast

F   D

E
South
Original position

North
D

C   E

West B | F East

A   G

H
South
New Position
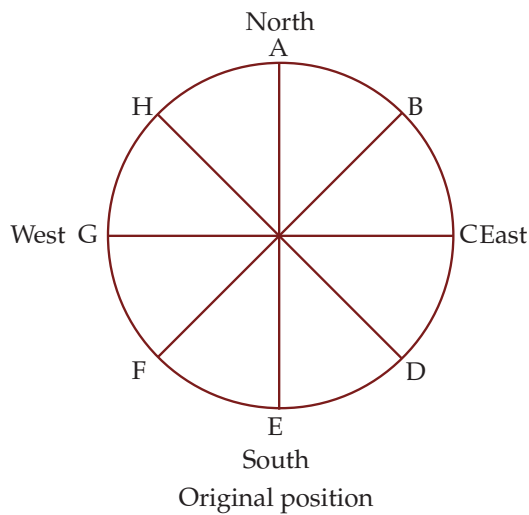
Clearly B will Face west

Example 11: Five People A, B, C, D and E are seated around a round table. Every chair is spaced equidistant from adjacent chairs. (UPSC (CSAT) 2013)

    I.   C is seated next to A .

    II. A is seated two seats from D.

    III. B is not seated next to A.

Which of the following must be true?
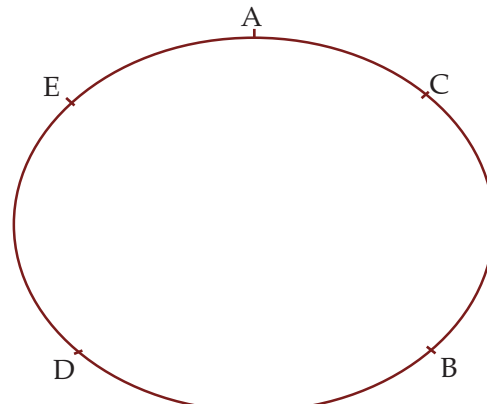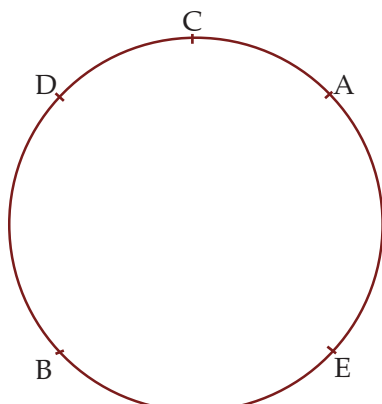
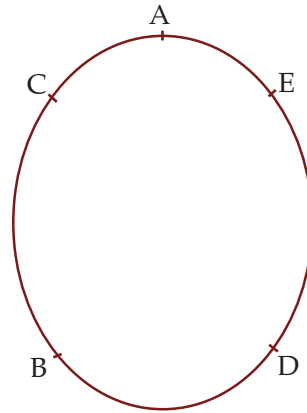   I.   D is seated next to B.

    II. E is seated next to A.
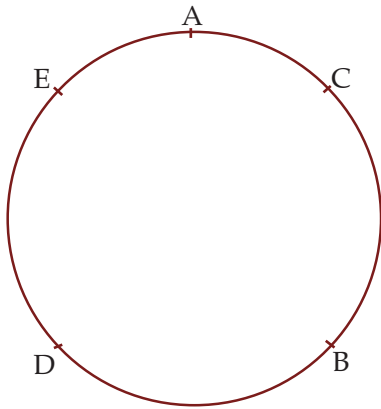
Select the correct from the options given below:

(a) Only I

(b) Only II

(c) Both I and II

(d) Neither I nor II

Solution:

According to the given information there are possible Seating arrangements.

C

D   A

B   E

A

E   C

D   B

From the above arrangements. It is clear that D is seated next to B . Also E is next to A.

Clearly both statements I and II are true.

Example 12: **Study the following Question carefully and answer the given questions.**

Eight friends A, B, C, D,E, F, G and H are sitting in a circle facing the centre, not necessarily in the same order. D sits third to the left of A. E sits to the immediate right of A. B is third to left of D. G is second to the right of B. C is neighbour of B. C is third to left of H. (GIC 2012)

1) Who amongst the following is sitting exactly between F and D?

    (a) C   (b) E   (c) H   (d) A

2) Three of the following four are alike in a certain way based on the information given above and so form a group. Which is does not belong to that group.

    (a) DC   (b) AH   (c) EF   (d) CB

3) Who amongst the following second to the left of H?

    (a) E   (b) B   (c) A   (d) None of these

4) Who amongst the following are immediate neighbours of G?

    (a) CA   (b) AF   (c) DC   (d) DF

5) Who amongst the following is sitting third to the right of A?

    (a) F   (b) B   (c) H   (d) C

Solution: Arrangements according to the question is as follows.
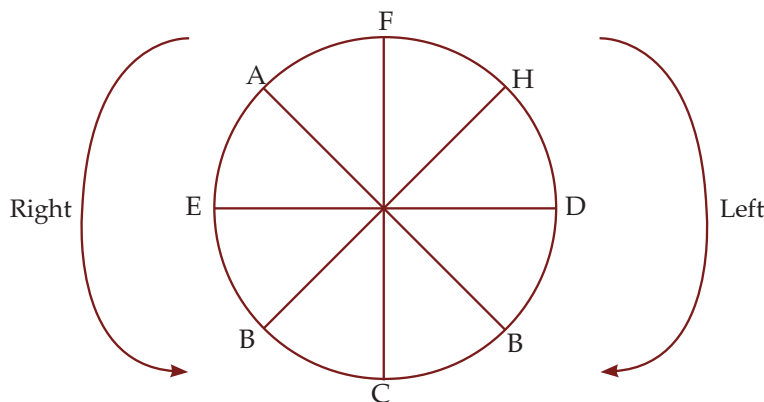
1) (c), Clearly H is sitting exactly F and D

2) (d)   DGC   AFH   EAF   C none B

        ↑   ↑   ↑   ↑

        Skipped   Skipped   Skipped   No member is skipped in between

    So, CB does not belong to the group.

3) (d) Clearly, G is sitting second to the left of H

4) (c) Clearly D and C immediate neighbours of G

5) (d) Clearly, C is sitting third to the right of A

EXERCISE 11.A

(Note: Questions are taken from previous exam questions papers of Competitive exams like SSC, RRB, MAT, UPSC etc.)

Choose the appropriate answer (a) or (b) or (c) or (d)

1. Five boys A, B, C, D and E are sitting in a row A is to the right of B and E is to the left of B but to the right of C. A is to the left of D. Who is second from the left end? (U.P.B.Ed 2013)

    (a) D   (b) A   (c) E   (d) B

2. There are five different houses, A to E, in a row. A is to the right of B and E is to the left of C and right of A, B is to the right of D. Which of the houses is in the middle? IB CA (IO) 2013)

    (a) A   (b) B   (c) C   (d) D

3. Five friends P, Q, R, S and T are sitting in a row facing North. Here, S is between T and Q and Q is to the immediate left of R. P is to the immediate left of T. Who is in the middle? (SSC (Multi Task) 2014)

    (a) S   (b) T   (c) Q   (d) R

4. Six children A, B, C, D, E and F are standing in a row. B is between F and D. E is between A and C. A does not stand next to F or D. C does not stand next to D. F is between which of the following pairs of children? (SSC (FCI) 2012)

    (a) B and E   (b) B and C   (c) B and D   (d) B and A

5. There are eight books kept one over the other. Two books are on Organisation Behaviour, two books on TQM, three books on Industrial Relations and one book is on Economics. Counting from the top, the second, fifth and sixth books are on Industrial Relations. Two books on Industrial Relations are between two books on TQM. One book of Industrial Relations is between two books on Organizational Behaviour while the book above the book of Economics is a book of TQM. Which book is the last book from the top? (MAT 2011)

    (a) Economics   (b) TQM

    (c) Industrial Relations   (d) Organizational Behaviour

6. Five boys are standing in a row facing East . Pavan is to the left of Tavan , Vipin and Chavan. Tavan , Vipin and Chavan are to the left of Nakul. Chavan is between Tavan and Vipin. If Vipin is fourth from the left , then how far is Tavan from the right ?

    (a) First   (b) Second   (c) Third   (d) Fourth

7. Six persons M, N, O, P, Q and R are sitting in two rows with three persons in each row. Both the row are in front of each other. Q is not at the end of any row. P is second the left of R. O is the neighbour of Q and diagonally opposite to P. N is the neighbour of R. Who is in fronts N? (UPSC (CSAT) 2011)

    (a) R   (b) Q   (c) P   (d) M

8. Six persons A, B, C, D, E and F are sitting in two rows, three in each row. (MAT 2011)

    (I) E is not at the end of any row

    (II) D is second to the left of F

    (III) C, the neighbor of E, is sitting diagonally opposite to D

    (IV) B is the neighbor of F.

    Which of the following are in one of the two rows?

    (a) D, B and F   (b) C, E and B   (c) A, E and F   (d) F, B and C

Direction (Q.No.9): Read the following information carefully and answer the question that follows.

Five boys A_1, A_2, A_3, A_4 and A_5 are sitting in a stair in the following way. (RRB (TC/CC) 2010)

    I. A_5 is above A_1

    II. A_4 is under A_2

    III. A_2 is under A_1

    IV. A_4 is between A_2 and A_3.

9. Who is at the lowest position of the stair?

    (a) A_1 (b) A_3 (c) A_5 (d) A_2

10. Five children are sitting in a row. S is sitting next to P but not T. K is sitting next to R, who is sitting on the extreme left and T is not sitting next to K. Who is/are adjacent to S? (NIFT (UG) 2014)

    (a) K and P   (b) R and P   (c) Only P   (d) P and T

11. Five senior citizens are living in a multi-storeyed building. Mr. Muan lives in a flat above Mr. Ashokan, Mr. Lokesh in a flat below Mr. Gaurav, Mr. Ashokan lives in a flat above Mr. Gaurav and Mr. Rakesh lives in a flat below Mr. Lokesh. Who lives in the topmost flat? (MAT 2013).

    (a) Mr. Lokesh   (b) Mr. Gaurav   (c) Mr. Muan   (d) Mr. Rakesh

12. In a gathering seven members are sitting in a row. 'C' is sitting left to 'B' but on the right to 'D'. 'A' is sitting right to 'B', 'F; is sitting right to 'E' but left to 'D'. 'H' is sitting left to 'E'. Find the person sitting in the middle. (SSC (10+2) 2013)

    (a) C   (b) D   (c) E   (d) F

Directions (No: 13-17): Study the following information carefully to answer the given questions.

A to H are seated in straight line facing North. C sits fourth left of G. D sits second to right of G. Only two people sit between D and A. B and F are immediate neighbours of each other. B is not an immediate neighbour of A. H is not neighbour of D. (GIC 2012)

13. Who amongst the following sits exactly in the middle of the persons who sit fifth from the left and the person who sit sixth from the right?

    (a) C   (b) H   (c) E   (d) F

14. Who amongst the following sits third to the right of C?

    (a) B   (b) F   (c) A   (d) E

15. Which of the following represents persons seated at the two extreme ends of the line?

    (a) C, D   (b) A, B   (c) B, G   (d) D, H

16. What is the position of H with respect to F?

    (a) Third to the left   (b) Immediate right (c) Second to right   (d) Fourth to left

17. How many persons are seated between A and E?

    (a) One   (b) Two   (c) Three   (d) Four

Directions (Q. No. 18-22) (MAT 2012)

Study the following information carefully to answer the given questions.

Ten students are A to J are sitting in a row facing west.

   I.   B and F are not sitting on either of the edges.

  II.   G is sitting left of D and H is sitting to the right of J.

 III.   There are four persons between E and A.

 IV.   I is the north of B and F is the south of D.

  V.   J is between A and D and G is in between E and F.

 VI.   There are two persons between H and C.

18. Who is sitting at the seventh place counting from left?

    (a) H   (b) C   (c) J   (d) Either H or C

19. Who among the following is definitely sitting at one of the ends?

    (a) C   (b) H   (c) E   (d) Cannot be determined

20. Who are immediate neighbours of I?

    (a) BC   (b) BH   (c) AH   (d) Cannot determined

21. Who is sitting second left of D?

    (a) G   (b) F   (c) E   (d) J

22. If G and A interchange their positions, then who become the immediate neighbours of E?

    (a) G and F   (b) Only F   (c) Only A   (d) J and H

Directions (Q. Nos. 23-24) Read the following information carefully and then answer the questions that follow.

A group of seven singers, facing the audience, are standing in line on the stage as follows.

    I.   D is to the immediate right to C

    II. F is standing beside G.

    III. B is to the immediate left of F

    IV. E is to the immediate left of A

    V. C and B have one person between them

    VI. A and D have oneperson between them

23. Who is on the Second extreme right?

    (a) D   (b) F   (c) G   (d) E

24. If we start counting from the left, on which number is B ?

    (a) 1st (b) 2nd (c) 3rd (d) 5th

Directions (Q. No. 25- 27): Study the following information carefully to answer the given questions.

Eight persons P to W are sitting in front of one another in two rows. Each row has four persons. P is between U and V and facing North. Q, who is to the immediate left of M is facing W. R is between T and M and W is to the immediate right of V.

(UCO Bank 2011)

25. Who is sitting in front of R?

    (a) U   (b) Q   (c) V   (d) P

26. Who is to the immediate right of R?

    (a) M   (b) U   (c) M or T   (d) None of these

27. In which of the following pairs, persons are sitting in front of each other?

    (a) MV   (b) RV   (c) TV   (d) UR

28. Four girls A, B, C, D are sitting around a circle facing the centre. B and C infront of each other, which of the following is definitely true ? (MAT 2009)

    (a) A and D infront of each other   (b) A is not between B and C

    (c) D is left of C   (d) A is left of C

ANSWERS

1.	(c)	2.	(a)	3.	(a)	4.	(b)	5.	(a)	6.	(d)	7.	(b)
8.	(a)	9.	(b)	10.	(d)	11.	(c)	12.	(b)	13.	(d)	14.	(c)
15.	(d)	16.	(a)	17.	(a)	18.	(d)	19.	(c)	20.	(d)	21.	(a)
22.	(c)	23.	(b)	24.	(d)	25.	(d)	26.	(d)	27.	(a)	28.	(a)

NOTES