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**VIRTUAL COACHING CLASSES
ORGANISED BY BOS (ACADEMIC), ICAI**

**FOUNDATION LEVEL
PAPER 3: BUSINESS MATHEMATICS, LOGICAL
REASONING & STATISTICS**

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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 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.**

Patterns

- **BASED ON VARIOUS PATTERN OF SITTING ARRANGEMENTS ARE CLASSIFIED INTO**
- Linear Arrangements
- Circular Arrangements
- Polygon Arrangements

Problems

- 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 compiled with.**
- These type of questions **generally involve 5 to 8 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

- 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.
- Next, **determine usefulness of each information's** ,
- classify them accordingly into **'definite information'**, **'comparative information'** and **'negative information'**.
- When the place of any objects or persons is definitely mentioned then we say that it is a **definite information**,
- Ex : X is sitting on the right end of the bench.

- A. 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**.
- **Ex 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.
- B. 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.**

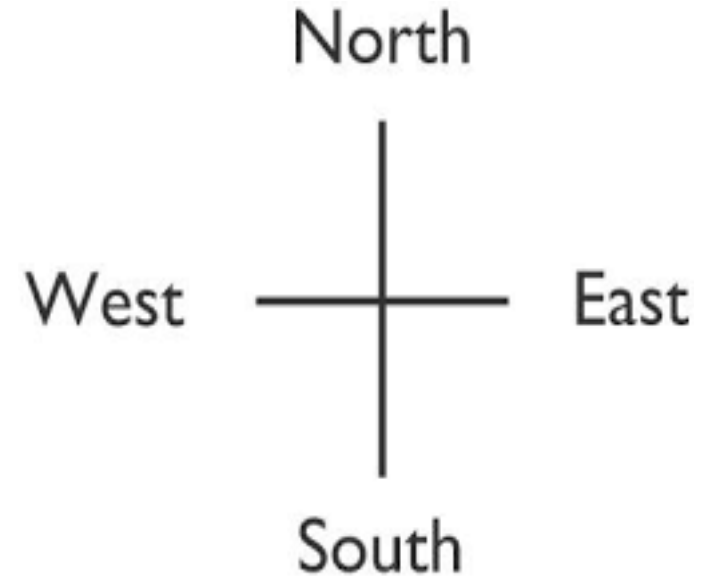
LINEAR ARRANGEMENT

- 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:**
- Identify the number of objects and their names.
- Use pictorial method to represent the people or objects and their positions.
- Arrange the information with relevant facts and their positions and try to find out the solution.

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

Example

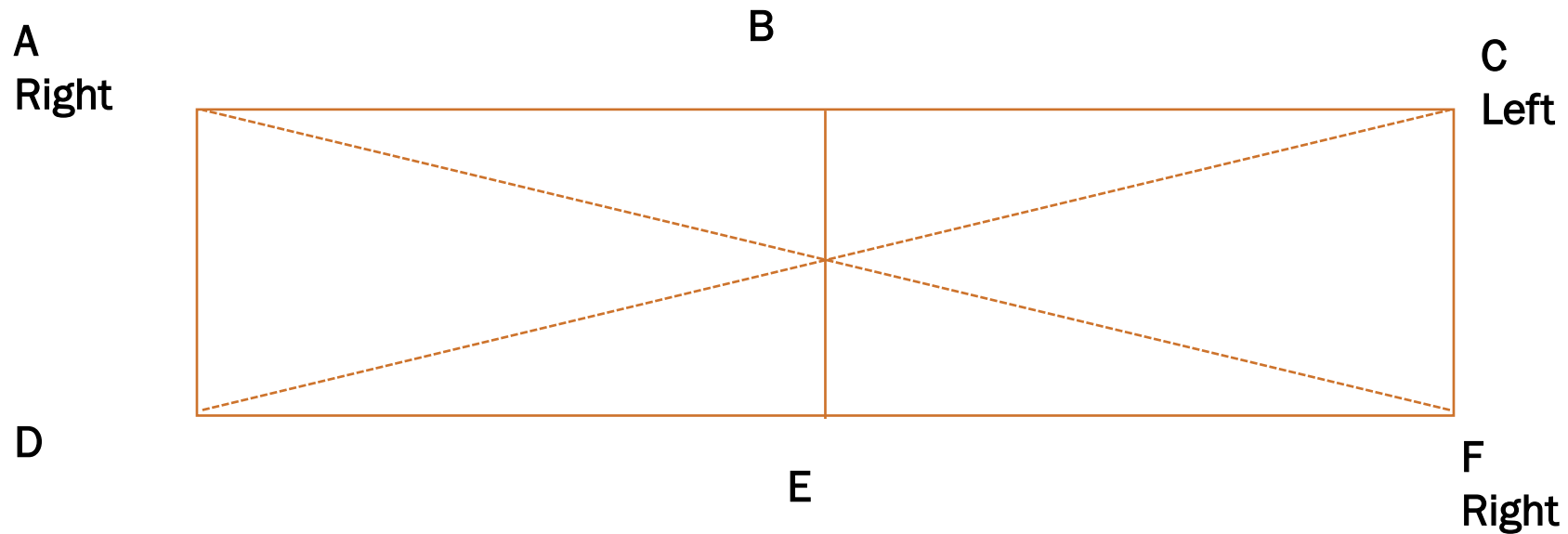
A. When direction of face is not clear, then we take based on diagram will be as follows:



- From the above diagram, it is clear that
 - Q, R, S, T are right of P but only Q is the immediate right of P.
 - S, R, Q, P are left of T but only S is the immediate left of T.
 - R, S, T are right of Q only R is the immediate right of Q.
 - R, Q, P are left of S but only R is the immediate left of S.
 - S and T are right of R but only S is the immediate right of R.
 - Q and P are left of R but only Q is the immediate left of R.
 - A is the immediate left of Q while T is the immediate right of S.
- *When direction of face is towards you, then the diagram will be as follows: Reverse of A*

Two Rows Sequence

- Let us see 6 persons seating in two rows.



Conclusions

- From the above diagram, it is clear that
- A is sitting opposite D
- B is sitting opposite E
- C is sitting opposite F
- D and C are sitting at diagonally opposite positions
- A and F are sitting at diagonally opposite positions.

- **Pg 11.3 , Example 3:** Four Children's are sitting in a row. A is occupying seat next to B but not next to C. If C is not sitting next to D? Who is occupying seat next to 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.
- P is fourth to the right of T
- W is fourth to the left of S
- R and U, which are not at the ends, are neighbours of Q and T respectively.
- W is 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 3 persons between P and T
- 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.
- So, T and S are sitting at the extreme ends.

- **Ex 5** : There are Five houses P, Q , R, S, T . P is right of Q and T is left of R and right of P . Q is right of S. Which house in the middle.
- (a) P (b) Q (c) R(d) T
- Order : S Q P T R
- Therefore, house P is middle.

- **Example 6:** 5 Friends are sitting on a bench. A is to the left of B but on the right of C, D is to the right of B but one the 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.
- C A B D E
- Clearly C and E are the extremes.

- **Example 7:** In a college party, 5 girls are sitting in a row. F is to the left of M and to the right of O. R is sitting to the 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
- , O is sitting in the middle.

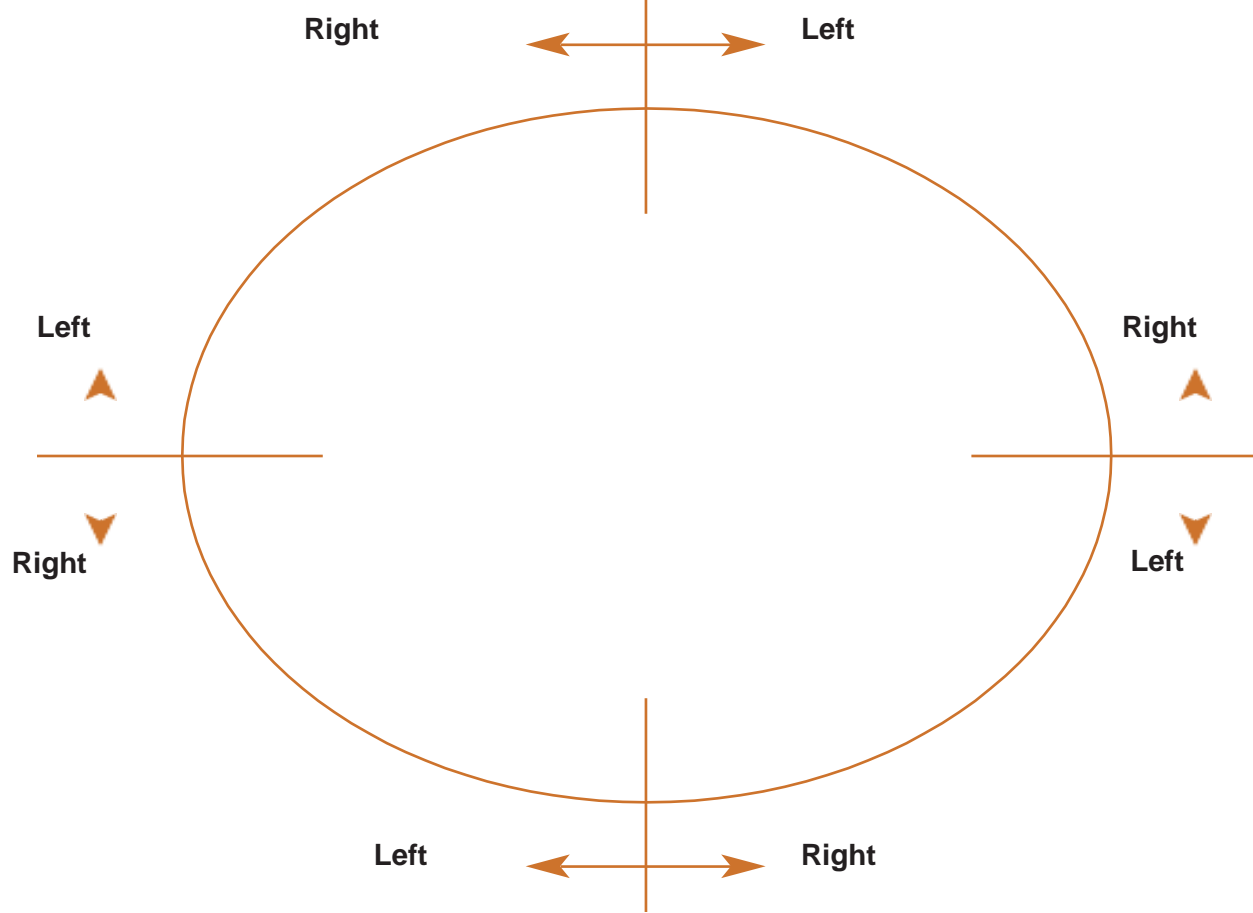
■ **Example 8:** Five boys A, B, C, D and E are standing in a row. D is on the right of E, B is on the left of E but on the right of A. D is one the left of C, who is standing on the extreme right. Who is standing in the middle?

■ (a) B (b) C(c) D(d) E

■ **Solution:** The sequence of Boys as follows

■ A B E D C

■ 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.

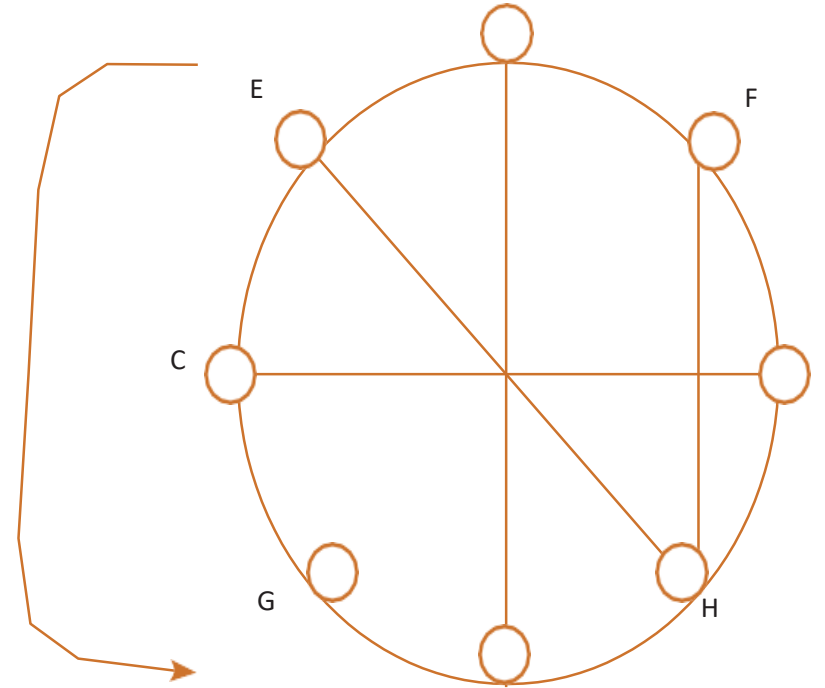
Circle rule

- Left movement is called clockwise rotation.
- Right movement is called anti-clockwise rotation.
 - *The above presentation is for 4 persons but for any number of persons, the direction is taken in the same manner.*
 - *For rectangular and sequence arrangement, directions are taken as discussed in two rows sequence.*

Example 9

- 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 .
- No two ladies or gentlemen are sitting side by side.
- C, who is sitting between G and E, is facing D.
- F is between D and A and facing G.
- H is to the right of B.
- **So order is : AFDHBGCE**

- (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



- **Example 11:** Five People A, B, C, D and E are seated about a round table. Every chair is spaced equidistant from adjacent chairs.
 - *C is seated next to A .*
 - *A is seated two seats from D.*
 - *B is not seated next to A.*

Which of the following must be true?

- D is seated next to B.
- E is seated next to A.
- Select the correct from the options given below:
 - Only I
 - Only II
 - Both I and II
 - Neither I nor II

Working out

■ Solution:

■ According to the given information there are possible Seating arrangements

■ Circle : DCAEB (Clockwise)

■ Or

■ EAC BD (Clockwise)

■ Or EACDB or CAE DB

■ 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.
- Order : CLOCKWISE= EAFHDGCB
- Who amongst the following is sitting exactly between F and D?
 - (a) C (b) E (c) H (d) A
- 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) DF (anticlockwise)

- Who amongst the following second to the left of H?
- **Ans = G**
 - (a) E(b) B(c) A (d) Noe of these
- Who amongst the following are immediate neighbours of G?
 - (a) CA (b) AF (c) DC (d) DF
- Who amongst the following is sitting third to the right of A?
 - (a) F (b) B(c) H(d) C



THANK YOU