ARRANGEMENTS & SYLLOGISM

- **Circular Permutation:**
- In circular permutations, the arrangements are in a circle, and rotations of the arrangement are considered identical. In other words, if you rotate an arrangement, it's still the same permutation.
- **Example:**
- Imagine arranging 3 people (A, B, C) in a circle. The number of circular permutations can be found by using the formula:
- Circular permutations=(n−1)!
- **Triangular permutation (arrangement on vertices and on sides)**
- **Square permutation(on sides and vertices)**

- **Hexagonal Permutation**
- A hexagon is a polygon with 6 sides. In terms of permutations, if you are arranging objects on a hexagonal shape, it is treated like a circular permutation because the arrangement will be periodic due to the symmetry of the hexagon.
- **Example:**
- If you want to arrange 4 people (A, B, C, D) on the vertices of a hexagon, since rotating the hexagon does not change the arrangement, the formula for circular permutations still applies.
- Hexagonal permutations=$(n-1)!$

- **Rectangular Permutation(on vertices and sides)**
- In a rectangular arrangement, the objects are arranged in a grid-like structure with rows and columns, where the arrangement doesn't have the rotational symmetry of a circle or hexagon.
- The number of rectangular permutations is simply the number of ways to arrange n distinct objects in n rows and k columns, which depends on the size of the grid and whether repetition is allowed.
- **Example:**
- **Arrange the 3 people in the 4 available positions**: This is a **permutation** of 3 distinct objects (A, B, C) in 4 available positions, but we can’t fill all 4 spots, just 3.
- The number of ways to do this is P(4,3).The formula is:
- $P(4,3)=4!(4-3)!=4!=24$

GEOMETRICAL ARRANGEMENTS

Q1.4 boys and 4 girls have to be seated around a circular table such that no two girls are adjacent to each other. In how many ways can they be seated?

Q2.8 people have to be seated on a rectangular table with 4 each on the longer sides. In how many ways can they be seated?

Q3.4 managers, 2 vice-presidents and 1 president have to be seated in a circle for a meeting such that the two vice-presidents sit on either side of the president. In how many ways can they be seated?

A. 120 B. 240 C. 360 D. 48

Q4.In how many ways can 6 couples be seated around a circular table such that each couple is sitting together?

A. 11 B. 6! x 64 C. 5! x 32 D. 5! x 64

Q5.There are 15 intermediate stations on a railway line from one terminus to another. In how many ways can 4 of these stations be chosen as halts for the train such that between any two of these 4 halts there are atleast 2 stations where the train does not halt?

A. 11C4 B.10C4 C.9C4 D.8C4

LINEAR ARRANGEMENTS

Seven persons, A, E, I, O, U, B and C are sitting in a straight line facing north (but not necessarily in the same order). U sits third from the right end. E sits third to the right of C, who is not an immediate neighbour of I or A, who sits third to the left of O, who is an immediate neighbour of C. U sits between O and E, who sits on the immediate left of I. Neither E nor B sits at any end of the line. There is only one person sit between I and U but that person is neither C nor B.

Q6.Who among the following is second to the left of O?

A. E B. I C. B D. Other than those given as options E. A

Q7. Who among the following sit at the ends of the rows?A. C and O B. I and E C. A and O

Q8. Who among the following sits third to the left of E?A. I B. C C. A

D. Can’t be determined E. Other than those given as options

SYLLOGISM

Structure of a Syllogism

The general structure of syllogism typically consists of three parts:

- **Major Premise:** This is the first statement, often a general statement. For example, "All engineers are villagers."
- **Minor Premise:** The second statement, which is more specific and related to the major premise. For example, "No villager is a nurse."

Conclusion: The third statement, derived from the major and minor premises. In our example, it's "No engineer is a nurse.

There are four basic types of categorical statements that form the foundation of syllogism premises and conclusions accurately. These categorical statements are essential for understanding and analyzing syllogistic reasoning:

Universal Affirmative: "All As are Bs."

This statement asserts that every element in category A is also in category B.

2. **Universal Negative: "No As are Bs."**

- This statement declares that there is no overlap between categories A and B; none of the elements in A belong to B.

3. **Particular Affirmative: "Some As are Bs."**

- This statement acknowledges that there is at least one element in category A that is also in category B. It doesn't specify how many.

4. **Particular Negative: "Some As are not Bs."**

- This statement implies that there is at least one element in category A that does not belong to category B.

By carefully analyzing these statements and their combinations, you can effectively solve syllogism questions and assess the validity of conclusions in logical reasoning problems.

Q1.Statement:

Some notebooks are books.

All books are papers.

Conclusions

I. Some notebooks are papers.

II. No paper is a notebook.

Q2. Statement I: Some plums are peaches

Statement II: All peaches are apples

Statement III: Some apples are mangoes

Conclusion I: Some mangoes are peaches

Conclusion II: Some apples are peaches

1. If only conclusion I follow
2. If only conclusion II follows
3. If conclusion I and II both follow
4. If neither conclusion I nor conclusion II follows
5. If either conclusion I or conclusion II follows.

Q3.Statement I: All trees are shrubs

Statement II: No shrub is a sapling

Statement III: All saplings are grass

Conclusions I: No tree is a grass

Conclusion II: Some saplings being trees is a possibility

1. If only conclusion I follow

2. If only conclusion II follows

3. If conclusion I and II both follow

4. If neither conclusion I nor conclusion II follows 5. If either conclusion I or conclusion II follows

Q4.Statement I: Some green is red

Statement II: Some red is blue

Statement III: All blue is yellow

Conclusion I: Some yellow is green

Conclusion II: Some yellow is red

1. If only conclusion I follow

2. If only conclusion II follows

3. If conclusion I and II both follow

4. If neither conclusion I nor conclusion II follows 5. If either conclusion I or conclusion II follows

Q5.Statement I: Some money is cash.

Statement II: Some cash are draft

Statement III: All drafts are bills

Conclusion I: Some money are draft

Conclusion II: Some money is bills

1. If only conclusion I follow

2. If only conclusion II follows

3. If conclusion I and II both follow

4. If neither conclusion I nor conclusion II follows 5. If either conclusion I or conclusion II follows

Q6.Statement I: All books are diary

Statement II: Some diaries are notebooks

Statement III: All notebooks are notepads

Conclusion I: Some notepads are diary

Conclusion II: Some notepads are books

1. If only conclusion I follow
2. If only conclusion II follows
3. If conclusion I and II both follow
4. If neither conclusion I nor conclusion II follows
5. If either conclusion I or conclusion II follows

THANKYOU