# CHAPTER :

# Permutation & Combination

- What is permutation and its usefulness.
- What is combination and its usage.
- Difference between permutation and combination.
- Tips to know when to use permutation and when combination.
- Solving word Problems involving P and C.

## A. Permutation-Combination

1. If 15 Cr-1 : 15 Cr = 5:1, find r?

2. How many distinct words can be formed from letters of the word 'TABLE' ?

3. How many 4 letter distinct words can be formed from letters of the word 'TABLE' ?

4 How many 3 letter distinct words can be formed from letters of the word 'TABLE' ?

5. How many distinct words can be formed from letters of the word 'MONSOON' ?

6. How many distinct words can be formed from letters of the word 'MATHEMATICS' ?

7. How many distinct words can be formed from letters of the word 'MALAYALAM' ?

8. In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?



9. In how many different ways can the letters of the word 'CORPORATION' be arranged so that the vowels always come together?

10. Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?

11. How many 3-digit numbers can be formed from the digits 2, 3, 5, 6, 7 and 9, which are divisible by 5 and none of the digits is repeated?

12. How many numbers of five digits can be formed with the digit 0, 1, 2, 4, 6 and 8?

13. In a group of 6 boys and 4 girls, four children are to be selected. In how many different ways can they be selected such that at least one boy should be there?

14. How many odd numbers of three digits can be formed with the digits 0,1,2,3,4,5 and 6?

15. How many words of 4 letters beginning with either A or E can be formed with the letters of the word EQUATION?

16. How many numbers of 4 digits, divisible by 5, can be formed with the digits 0, 2, 5, 6 and 9?

17. A candidate is required to answer 6 out of 10 questions which are divided into groups, each containing five questions. In how many ways can be answer the questions, if he is not allowed to attempt more than 4 questions from a group?

18. A box contains 2 white balls, 3 black balls and 4 red balls. In how many ways can 3 balls be drawn from the box, if at least one black ball is to be included in the draw?

19. In how many different ways can the letters of the word 'MATHEMATICS' be arranged so that the vowels always come together?

20. The number of ways in which 6 men and 5 women can dine at a round table if no two women are to sit together is given by

(a) $6! \times 5!$ (b) $5! \times 4!$ (c) 30 (d) $7! \times 5!$
(e) None of these

21. In how many ways can 7 persons be seated at a round table if 2 particular persons must not sit next to each other?

(a) 5040 (b) 240 (c) 480 (d) 720 (e) None of these

22. The number of ways in which a team of eleven players can be selected from 22 players including 2 of them and excluding 4 of them is:

(a) 16C11 (b) 16C5 (c) 16C9 (d) 20C9 (e) None of these

23. In how many different ways can the letters of the word 'PRETTY' be arranged?

(a) 120 (b) 36 (c) 360 (d) 720 (e) None of these

24. In how many different ways can 4 boys and 3 girls be arranged in a row such that all boys stand together and all the girls stand together?

(a) 75 (b) 576 (c) 288 (d) 24 (e) None of these

Directions (25-26): Answer these questions on the basis of the information given below:

From a group of 6 men and 4 women a Committee of 4 persons is to be formed.

Q25. In how many different ways can it be done so that the committee has at least one woman?

(a) 210 (b) 225 (c) 195 (d) 185 (e) None of these

Q26. In how many different ways can it be done, so that the committee has at least 2 men?

(a) 210 (b) 225 (c) 195 (d) 185 (e) None of these

Q27. In how many different ways can the letters of the word 'ARMOUR' be arranged?

(a) 720 (b) 300 (c) 640 (d) 350 (e) None of these

Q28. In how many ways can 5 persons be chosen from 6 boys and 4 girls so as to include exactly one girl?

(a) 252 (b) 210 (c) 126 (d) 90 (e) 60

Q29. From 5 officers and 7 jawans in how many ways can 4 be chosen to include exactly 2 officer?

(a) 210 (b) 120 (c) 200 (d) 105
(e) None of these

Q30. From 8 officers and 12 jawans in how many ways can 7 be chosen to include exactly 3 officers?

(a) 27720 (b) 27270 (c) 26620 (d) 27660 (e) None of these

Q31. From a group of 6 men and 4 women a committee of 4 persons is to be formed.
(i) In how many different ways can it be done so that the committee has at least one woman?

(a) 210 (b) 225 (c) 195 (d) 185 (e) None of these

Q32. In how many ways 3 boys and 3 girls can be seated in a row so that boys and girls are alternate?

(a) 9 (b) 36 (c) 72 (d) Data inadequate
(e) None of these

Q33. In how many ways, 5 Indians and 4 Americans can be seated at a round table if

a) There is no restriction
b) All the four Americans sit together
c) No two Americans sit together
d) All the 4 Americans do not sit together

a) 8!
b) 5! * 4!
c) 4! * 5P4
d) 8! – (5! * 4!)



Q34. There is meeting of 20 delegates is to be held in a hotel. In how many ways these delegates can be seated along a round table, if three particular delegates always seat together.

a) 17! 3!

b) 18! 3!

c) 17! 4!

d) can't be determined

Ans 17! * 3!

Q35. In how many ways 5 African and five Indian can be seated along a circular table, so that they occupy alternate position.

a) 5! 5!

b) 4! 5!

c) 5! 4!

d) 4! 4!

Ans 4! * 5!

Q36. In how many ways can 5 boys and 4 girls can be seated in a row so that they are in alternate position.

a) 2780

b) 2880

c) 2800

d) 2980

Ans 5! * 4! = 2880

**Q37. In a birthday party, every person shakes hand with every other person. If there was a total of 28 handshakes in the party, how many persons were present in the party?**

**A. 9** **B. 8**

**C. 7** **D. 6**

**n(n-1) /2 = 28**

**n = 8**

**Q38. 17 students are sitting in a circle. Each person shakes hands with everyone but his/her neighbours. How many handshakes have been exchanged?**

14 + 14 + 13 + 12 + ….1 = 119