**Ans the following with explanation:-**

1. How many different ways 5 people can stand in a line?
2. How many different ways 5 people can sit in a round table?
3. How many different ways a necklace with 5 beads can be made?

4. How many ways the letters of the word “MAKERS” can be arranged?

5. How many ways the letters of the word “ARMADA” can be arranged?

6. How many ways the letters of the word “BELLEVUE” can be arranged?

7. Suppose you want to arrange 7 people, A, B, C, D, E, F, and G in seats at a movie theater. But A, B, and C have been best friends since first grade and insist on sitting together (although not necessarily in the order ABC). How many ways can they be seated?

8. Suppose you want to arrange A, B, C, D, E in seats at a movie theater, except that A refuses to sit next to B (she knows what she did). How many ways can the people be seated?

9. Suppose you want to arrange 7 people, A, B, C, D, E, F, and G, in seats at a movie theater, subject to the rules:

i)A, B, and C must sit together

ii)E and F must sit together

10. Same Problem(Problem-9), subject to the rules:

i) A, B, and C must sit together

ii)C and D must sit together

11. Same Problem(Problem-9), subject to the rules:

i)A, B, and C are sitting next to each other

ii)D is sitting next to the ABC-group

12. How many ways 16 distinct balls can be grouped in 5 distinct basket.?

13. How many ways 16 identical balls can be grouped in 5 distinct basket.?

14. How many ways 16 distinct balls can be grouped in 5 identical basket.?

15. How many ways 16 identical balls can be grouped in 5 identical basket.?

13. x1+x2+x3+x4+x5=18, what is the number of solutions to this equation in non-negative integers?

14.How many unique ways can you arrange the letters in the word EMBEDDED?

15. Suppose you have 5 beads: 1 yellow, 1 red, 1 blue, and 2 green, and you want to arrange them on a necklace. (Remember that the necklace can be rotated, so for example the order YRBGG is the same as the order BGGYR, and the necklace can also be flipped over, so the order YRBGG is the same as the order GGBRY.) How many unique ways can the beads be arranged on the necklace?

16. If you have five friends A, B, C, D, E sitting in a row at a movie theater, how many ways can they be seated so that B is not sitting immediately to the right of C?

17.If you have the same five friends A, B, C, D, E sitting in a row, how many ways can they be seated so that B is sitting anywhere to the right of C (not necessarily next to C)? (Hint: Consider all the possible arrangements. For every arrangement with B sitting to the right of C, there is an opposite arrangement with B sitting to the left of C...)

18. You are sorting assigning 6 people, A, B, C, D, E and F, into 3 different hotel rooms. How many ways can they be sorted such that A is in the same room with C, and B is not in the same room with D? (Some hotel rooms may be empty.)

19. Again, you are sorting A, B, C, D, E and F into 3 different hotel rooms. How many ways can they be sorted such that A is in the same room with B, but B is not in the same room with C?