

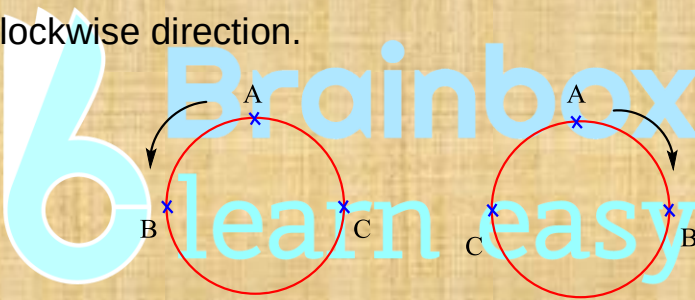
Chapter 07

PERMUTATIONS AND COMBINATIONS

CIRCULAR ARRANGEMENT:

- The number of circular permutations of 'n' different things taken all at a time is $(n - 1)!$.

Consider the two circular permutations ABC, ACB as shown in figure. In either of these permutations each thing has the same neighbours. In the first permutations A, B, C are arranged in anticlockwise and in the second permutation A, B, C are arranged in clockwise direction.



- If we ignore the direction, then these two permutations become a single permutation. If we wish to count the number of permutations of which in any two permutations all the things shall not have the same neighbours, then we consider the permutations in one direction only. For example in the preparation of garland or necklace we consider the circular permutations in one direction only.
- The number of circular permutations of 'n' things taken all at a time in one direction is $\frac{1}{2}(n - 1)!$.

EXAMPLE- 1:

Find the number of ways of arranging 7 persons around a circle.

SOLUTION:

$(n - 1)!$, Here ' $n = 7$ '.

$(7 - 1)! = 6! = 720$ ways.

EXAMPLE- 2:

Find the number of ways of preparing a chain with 6 - different coloured beads.

SOLUTION:

The number of ways a preparing a chain with 6 - different coloured beads.

$$= \frac{1}{2}(n - 1)!, \text{ Here } 'n = 6'.$$

$$= \frac{1}{2}(6 - 1)!$$

$$= \frac{1}{2}(5!)$$

$$= \frac{1}{2}(120)$$

$$= 60 \text{ ways.}$$

Brainbox
learn easy