

## Permutation Formula

For repetition  $\therefore n^r$

For NO repetition  $\therefore \frac{n!}{(n-r)!}$

- ① If there are  $n$  subjects of which  $P_1$  are alike of one kind,  $P_2$  of another kind,  $P_3$  of another kind &  $P_r$  are alike of  $r^{\text{th}}$  kind - such that  $(P_1 + P_2 + \dots + P_r) = n$

The number of permutations of these  $n$  objects is  $= \frac{n!}{P_1! P_2! \dots P_r!}$

## Cyclic Permutations $\therefore$

of  $n$  different things  $\rightarrow \frac{n!}{n} = (n-1)!$

if clockwise & anticlockwise orders are taken as different.

② If  $m$  things out of  $n$  always come together

③ No. of all  $n$  permutations  $= \frac{n!}{(n-m+1)}$