FACE

Concept 5: Computation of Combination

Number of ways of arranging '*n*' items in '*r*' slots without repetition (${}^{n}P_{r}$) comprises of two steps, selecting '*r*' out of '*n* items (${}^{n}C_{r}$) and then arranging the '*r*' items in the '*r*' slots(r!).

$${}^{n}P_{r} = {}^{n}C_{r} \times r!$$

$$n!/(n-r)! = {}^{n}C_{r} \times r!$$

$${}^{n}C_{r} = \frac{n!}{(n-r)! \times r!}$$

Remember

- ${}^{n}C_{r} = {}^{n}C_{n-r}$
- ${}^{n}C_{0} = 1$
- ${}^{n}C_{n} = 1$
- ${}^{n}C_{1} = n$

Drill 5

a. From a squad of 8 members, in how many ways can you pick a team of 5 members?

Is selecting 3 members, who will not be a part of the team, the same as selecting 5 members who will be a part of the team? *Yes/No*

b. In how many ways can you form a cricket team of 11(comprising of 6 batsmen and 5 bowlers) from a squad of 16 (8 batsmen and 8 bowlers)?

Number of ways of selecting batsmen = _____ C _____ = _____

Number of ways of selecting bowlers = _____ C _____ = _____

Number of ways of selecting the team = _____ x _____ = _____

c. In how many ways can you form a committee of 4 from 5 men and 3 women?

   i. If the committee comprises of 2 men and 2 women? _____

   ii. The committee has at least 2 men? _____

   iii. The committee has no more than 2 women? _____

   iv. One particular member always has to be selected? _____

   v. One particular member should never be selected? _____

d. From 6 friends, in how many ways can you invite

   i. 3 friends to your house for a party? _____

   ii. 1 or more friends to your house for a party? _____

   iii. At least 2 friends to your house for a party? _____

e. In how many ways can you give one or more toffees to your friend from the 5 similar orange and 4 similar grape flavoured toffees? _____