

## Permutation and Combination

### \* Formulas:-

\* Combinations  ${}^nC_r = \frac{n!}{r!(n-r)!}$

\* Permutations  ${}^nP_r = \frac{n!}{(n-r)!}$

\*  ${}^nC_0 = 1$

\*  ${}^nC_1 = n$

$\Rightarrow {}^{10}C_0 = 1$

$\Rightarrow {}^{10}C_1 = 10$

$\Rightarrow {}^{10}C_2 = {}^{10}C_8 = 1$

${}^{10}C_9 = {}^{10}C_1 = 10$

$\Rightarrow {}^{15}C_4 = \frac{15 \times 14 \times 13 \times 12}{4 \times 3 \times 2 \times 1} = 1365$

$\Rightarrow {}^{15}C_3 = \frac{15 \times 14 \times 13}{3 \times 2 \times 1} = 1365$

$\Rightarrow {}^{15}C_{12} = {}^{15}C_3 = \frac{15 \times 14 \times 13}{3 \times 2 \times 1} = 1365$

$\Rightarrow {}^{12}C_3 = \frac{12 \times 11 \times 10}{3 \times 2 \times 1} = 220$



① Pick any one item

$G_1, G_2, G_3$

OR  
 $H_1, H_2$



$\Rightarrow$  3 way

+ 2 way

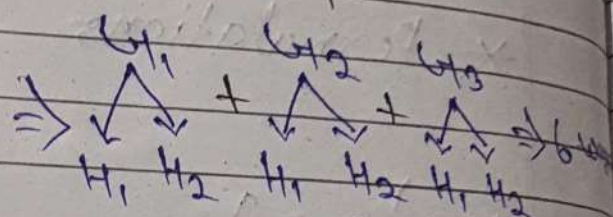
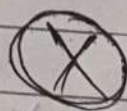
$\Rightarrow$  5 ways

② Pick any <sup>one</sup>  $G$  and one  $H$

$G_1, G_2, G_3$

and

$H_1, H_2$



③ 7 men 6 women ✓

Selected 5 person and atleast 3 men

$$\binom{7}{3} \times \binom{6}{2} + \binom{7}{4} \times \binom{6}{1} + \binom{7}{5}$$

$$\Rightarrow \left( \frac{7 \times 6 \times 5}{3 \times 2 \times 1} \times \frac{6 \times 5}{2 \times 1} \right) + \left( \frac{7 \times 6 \times 5}{4 \times 3 \times 2 \times 1} \times 6 \right) + \left( \frac{7 \times 6 \times 5 \times 4 \times 3}{5 \times 4 \times 3 \times 2 \times 1} \right)$$

$$= 525 + \left( \frac{7 \times 6 \times 5}{3 \times 2 \times 1} \times 6 \right) + \left( \frac{7 \times 6 \times 5 \times 4 \times 3}{5 \times 4 \times 3 \times 2 \times 1} \right)$$

$$= 525 + 210 + 21$$

$$= 756 \text{ Ans}$$

④ the letters 'LEADING' arrange in such way that vowel always come together

We have arrange LNDG(EAE)

$$\Rightarrow (4+1+5) \Rightarrow 5! = 120 \text{ ways}$$

The vowel (EAI) can be arrange among themselves in  $3! = 6$  ways.

Required number =  $(120 \times 6) = 720$  ways.

// questions practice - Indiabix