

2, 3, 3, 4, 4, 4

$$\left(5 \times \frac{5!}{2!2!} + 3 \times \frac{5!}{3!} + 2 \times \frac{5!}{3!2!} \right) \left(10^0 + 10^1 + 10^2 + 10^3 + 10^4 + 10^5 \right)$$

De Arrangement

Find no. of ways to place 'n' letters in 'n' addressed envelopes so that no letter is placed in its corresponding envelope.

$$A_1 = L_1 \text{ is correctly placed}$$

$$A_2 = L_2 \text{ ——— }$$

$$A_n = L_n \text{ ———}$$

$$= n! - {}^n(A_1 \cup A_2 \cup \dots \cup A_n)$$

$$= n! - [{}^nC_1(n-1)! - {}^nC_2(n-2)! + {}^nC_3(n-3)! - {}^nC_4(n-4)! + \dots]$$

$$D_n = n! \left(\frac{1}{1!} - \frac{1}{2!} + \frac{1}{3!} - \frac{1}{4!} + \dots + \frac{(-1)^n}{n!} \right)$$

Q.

Col-II

$$D_5 = 5! \left(\frac{1}{2!} - \frac{1}{3!} + \frac{1}{4!} - \frac{1}{5!} \right) = 44$$

$$D_6 = 6! \left(\frac{1}{2!} - \frac{1}{3!} + \frac{2}{4!} - \frac{1}{5!} + \frac{1}{6!} \right) = 265$$

$$\begin{aligned} \therefore 6C_1 D_5 + D_6 \\ = 6 \times 44 + 265 \end{aligned}$$

$$\begin{aligned} & \underline{2.} \quad 6! - \left(4 \text{corr.} + \boxed{5 \text{ corr.}} + 6 \text{ corr.} \right) 6 \\ &= 6! - \left[6C_4 D_2 + 0 + 1 \right] \text{One to one} \\ &= 6! - (15 \times 1 + 1) \quad D_2 = 2! \cdot \left(\frac{1}{2!} \right) = 1 \end{aligned}$$

$$\begin{aligned} D_2 &= 1 & D_3 &= 2 & D_4 &= 9 & D_5 &= 44 & D_6 &= 265 \end{aligned}$$

Find no. of ways to match

so that

1. atleast 5 questions are
wrongly matched

2. atmost 3 questions are
correctly matched

3. all wrongly matched

$$\boxed{3 \times 6 = 265}$$

