

28-09-19

Permutation & Combination

$$1. {}^8C_3 = \frac{8 \times 7 \times 6 \times 5 \times 4 \times 3}{3 \times 2 \times 1} = \frac{8 \times 7 \times 6}{3 \times 2 \times 1}$$

$$= \underline{\underline{56}}$$

$$2. {}^{16}C_{13} = \frac{16 \times 15 \times 14 \times 13 \times 12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{13 \times 12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}$$

$$= 16 \times 1$$

$$2. {}^{16}C_{13} = {}^{16}C_{(16-13)} = {}^{16}C_3 = \frac{16 \times 15 \times 14}{3 \times 2 \times 1}$$

$$= \underline{\underline{560}}$$

$$\star {}^nP_r = n(n-1)(n-2) \dots (n-r+1) \Rightarrow \frac{n!}{n-r!}$$

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

Q. In how many ways can a group of 5 men & 2 women be made out of a total of 7 men & 3 women.

$${}^7C_5 \times {}^3C_2$$

Q. How many 4 letter words with or without meaning can be formed out of the letter of the word 'LOGARITHMS' if repetition of letters is not allowed.

$${}^{10}P_4 = 10 \times 9 \times 8 \times 7 \\ = \underline{\underline{5040.}}$$

Q. In how many diff. ways can the letter of the word 'MATHEMATICS' be arranged so that the vowels always come together.

$$\cancel{{}^8P_5} = \cancel{1 \times 1 \times 1 \times 1 \times 1} \cdot \overset{C}{\text{MTHMTC}} \overset{V}{\text{AEAI}}$$

$$\frac{8!}{2! \times 2!} \quad \underline{\underline{10080}}$$

$$\text{Conso-} = \frac{8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{2 \times 1 \times 2 \times 1} = \underline{\underline{10080}}$$

$$\text{Vowel} = \frac{4!}{2!} = \frac{4 \times 3 \times 2 \times 1}{2 \times 1} = 12$$

$$\therefore 10080 \times 12 = \underline{\underline{120960.}}$$

Q. OPTICAL :

C
P, T, C, L

V
O, I, A

$$\text{Con} = 5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$$

$$V = 3! = 3 \times 2 \times 1 = 6$$

$$= 120 \times 6 = \underline{720}$$

Q. FIGHT

Q. Design

Q. ENGINEERING

Q. Daughter

Q. PRESENT.

Q. Digest

$$\text{Q. Evaluate} = \frac{50!}{48!}$$

$$= 50 \times 49 = 2450$$

Q. In a group of 6 boys & 4 girls, 4 children are to be selected. In how many different ways can they be selected such that at least 1 boy should be there.

$$(1 \text{ boy} \times 3 \text{ g}) + (2 \text{ b} \times 2 \text{ g}) + (3 \text{ b} \times 1 \text{ g}) + (4 \text{ b})$$

$$\Rightarrow ({}^6C_1 \times {}^4C_3) + ({}^6C_2 \times {}^4C_2) + ({}^6C_3 \times {}^4C_1) + ({}^6C_4)$$

Q. In how many ways a committee, consisting of 5 men & 6 women can be formed from 8 men & 10 women.

$${}^8C_5 \times {}^{10}C_6$$

Q. A box contain 2 white balls, 3 black balls & 4 Red balls. In how many ways can 3 balls be drawn from the box, if atleast 1 black ball is to be included in the draw.

$$(1b \cdot 2nb) + (2b \cdot 1nb) + (3b)$$

$$({}^3C_1 \times {}^6C_2) + ({}^3C_2 \times {}^6C_1) + ({}^3C_3)$$

Q. From a group of 7 men & 6 women, 5 persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done.

a) 564 b) 645 c) 735 d) 756