PERMUTATION AND COMBINATION

1. (_ _) _ _ _ _ _ _ _ _ _ _ _ _

   1   23

   ~~24!~~

   ∴ No. of ways = $(n-1)! = 23!$

   ⇒ $23! \times 2!$ (Ans)

2. B G B G B G B G B

   $5! \times 4!$

3. LEADER

   ~~6 5 4 3 2 1 = 720~~

   _ _ _ _ _ _
   6 5 4 3 2 1 = $\frac{720}{2!} = 360$ (Ans)

12 Monday
Day (163-202)

4. 2W, 3B, 4R.

Atleast 1 Black = $3C_1 \times 6C_2 = 3 \times \frac{6 \times 5}{2} = 45$

2 Black = $3C_2 \times 6C_1 = 3 \times 6 = 18$

3 Black = $3C_3 = 1$

∴ Total = 45 + 18 + 1 = 64 (Ans)

5. 2, 3, 0, 4, 3, 3, 3

6 5 4 3 2 1

$\frac{6 \times 7 \times 7 \times 7 \times 7 \times 7}{4 \times 3 \times 2 \times 1}$

= Total ways = $\frac{6 \times 6!}{4!}$

6 digit no. = $\frac{1 \times 6!}{4!} = 30$

7 digit no. = $\frac{6 \times 6!}{4!} = \frac{6 \times 720}{24} = 180$

$\frac{7!}{4!} = 210$

∴ No. greater than million = 180

Tuesday 13
Day (164-201)

6. 6N, 7I, 4P

Total = $6C_1 \times 7C_1 \times 4C_1$

= 6 × 7 × 4

= 168 (Ans)

7. SCISSORS

$\frac{8!}{4!} = 8 \times 7 \times 6 \times 5$

= 1680 (Ans)

8. 1 → 5
2 → 4

⇒ $5P_4 \cdot 4P_4 + 5P_5 \cdot 4P_3$

= 5! · 4! + 5! · $\frac{4!}{1!}$

= (120)(24)(2)

= 8

June 2023

14 Wednesday
Day (165-200)

8. 8 person $\begin{cases} 5,3 \\ 4,4 \end{cases}$

Total ways $= \frac{8!}{5!3!} + \frac{8!}{4!4!}$

$= \frac{8\times7\times6}{3\times2} + \frac{8\times7\times6\times5}{4\times3\times2}$

$= 56 + 70 = 126$

$= 126$ (Ans)

9. 10 L — 5 □ □ □ □ □
L — 5
L — 5
⋮
L — 5

Total no. of ways $= 5^{10}$ (Ans)

10. Selecting 7 people of 15 people $= {}^{15}C_7$
∴ 7 people arranged in circular table in $(7-1)! = 6!$
Remaining 8 in $7!$ ways

∴ Total $= {}^{15}C_7 \cdot 6! 7!$ (Ans)

June 2023

Thursday 15
Day (166-199)

11. EDUCATION
Consonants = DCTN

∴ Total no. of ways $= 4!5!$

12. 20 persons $\begin{cases} 2 \text{ brothers} \\ 18 \end{cases}$

fix 2 brothers, B_1 — B_2
∴ Rest 18 arranged in $18!$
& these 2 can be arranged..
⇒ Total $= 18! \times 2$ (Ans)

13. 6 person $\frac{1P \quad 2VP}{2 \quad \text{all}}$

Total no. of ways $= {}^2C_1 \times {}^5C_2 = \frac{2\times5\times4}{2} = 20$ (Ans)

June 2023

JUNE 2023

S		4	11	18	25	
M		5	12	19	26	
T		6	13	20	27	
W		7	14	21	28	
T	1	8	15	22	29	
F	2	9	16	23	30	
S	3	10	17	24		

16 Friday

Day (167-198)

14. f_1
f_2
f_3 — — — — —
f_4
f_5

∴ Total no. of ways = 5ps
= 5! = 120 (Ans)

15. 12 Bulb

B — 2 (ON, OFF)
B — 2
⋮
B

∴ Total ways = 2^{12}

But in one case all 12 bulbs will be off.

⇒ Total no. of ways = $2^{12} - 1$ (Ans)