



#### Permutations Ex 16.5 Q18

4 red, 3 yellow and 2 green discs.

Total discs = 9

Required number of ways

$$\begin{aligned}
 &= \frac{9!}{4!3!2!} \\
 &= \frac{9 \times 8 \times 7 \times 6 \times 5}{3 \times 2 \times 2} \\
 &= 1260
 \end{aligned}$$

Required number of ways = 1260

#### Permutations Ex 16.5 Q19

Total number of digits = 7

Now,

$$\text{number of 7-digit numbers} = \frac{7!}{3!2!}$$

$$= \frac{7 \times 6 \times 5 \times 4 \times 3!}{3! \times 2}$$

$$\begin{aligned}
 &= 7 \times 6 \times 5 \times 2 \\
 &= 420
 \end{aligned}$$

And, 0 cannot be first digit of the 7-digit numbers

∴ Number of 6-digit numbers

$$= \frac{6!}{3!2!}$$

$$= \frac{6 \times 5 \times 4 \times 3!}{3! \times 2}$$

$$\begin{aligned}
 &= 6 \times 5 \times 2 \\
 &= 60
 \end{aligned}$$

Hence, total number of 7-digit number which are greater than 1000000 =  $420 - 60 = 360$

#### Permutations Ex 16.5 Q20

There are 13 letters in the word 'ASSASSINATION' out of which 3 are A's, 4 are S's, 2 are I's, 2 are N's and the rest are all distinct.

Considering all S's together and treating them as one letter we have 10 letters.

These 10 letters can be arranged in  $\frac{10!}{3!2!2!}$

$$= \frac{10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3!}{3! \times 2 \times 2}$$

$$\begin{aligned}
 &= 10 \times 9 \times 8 \times 7 \times 6 \times 5 \\
 &= 151200.
 \end{aligned}$$

Hence, the total words are 151200

#### Permutations Ex 16.5 Q21

There are 9 letters in the word 'INSTITUTE' out of which 2 are I's, 3 are T's and the rest are all distinct.

∴ The total number of permutations of the letters of the word 'INSTITUTE' =  $\frac{9!}{2!3!}$

Hence, the total number of words are  $\frac{9!}{2!3!}$

\*\*\*\*\* END \*\*\*\*\*

