Permutations Ex 16.5 Q18

4 red, 3 yellow and 2 green discs.

Total discs = 9

Required number of ways

$$= \frac{9!}{4!3!2!}$$

$$= \frac{9\times8\times7\times6\times5}{3\times2\times2}$$

$$= 1260$$

Required number of ways = 1260

Permutations Ex 16.5 Q19

Total number of digits = 7

Now,

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

$$= \frac{7\times6\times5\times4\times3!}{3!\times2}$$

$$= 7\times6\times5\times2$$

$$= 420$$

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

$\therefore$ Number of 6-digit numbers

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

$$= \frac{6\times5\times4\times3!}{3!\times2}$$

$$= 6\times5\times2$$

$$= 60$$

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 $\frac{10!}{3!\,2!\,2!}$

$$= \frac{10\times9\times8\times7\times6\times5\times4\times3!}{3!\times2\times2}$$

$$= 10\times9\times8\times7\times6\times5$$

$$= 151200.$$

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.

$\therefore$ 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 **********