Permutations Ex 16.5 Q14

Total numer of digits = 7

Since, 0 cannot be first digit of the 7 digit numbers.

$\therefore$ Number of 6 – digit

Numbers $= \dfrac{6!}{2!3!}$ $\left[\because \begin{array}{l} 2\text{comes} \\ 2 \text{ times and } 3 \text{ comes } 3 \text{ times} \end{array}\right]$

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

$= 6 \times 5 \times 2$

$= 60.$

Now, number of 7-digit numbers $= \dfrac{7!}{2!3!} = \dfrac{7 \times 6 \times 5 \times 4 \times 3!}{2 \times 3!}$

$= 7 \times 6 \times 5 \times 2$

$= 420$

Hence, total number of numbers which is greater then 1 million = 420 – 60

= 360.

Permutations Ex 16.5 Q15

There are three copies each of 4 different books.

$\therefore$ Total number of copies = 12

$\therefore$ The number of ways in which these copies arranged in a shelf

$= \dfrac{12!}{3!\,3!\,3!\,3!}$

$= \dfrac{12!}{(3!)^4}$

Hence, required number of ways

$= \dfrac{12!}{(3!)^4}$

Permutations Ex 16.5 Q16

There are 11 letters in the word 'MATHEMATICS' out of which 2 are M's, 2 are A's, 2 are T's and the rest are all distinct.

so, the requisite number of words $= \dfrac{11!}{2!\,2!\,2!}$

If we fix C in the beginning, then the remaining 10 letters can be arranged in $\dfrac{10!}{2!\,2!\,2!}$

If we fix T in the beginning, then the remainning 10 letters can be arranged in $\dfrac{10!}{2!\,2!}$

Permutations Ex 16.5 Q17

Total number of molecules = 12

Now,

the chain contains 4 different molecules A, c, g, and T, and 3 molecules of each kind.

$\therefore$ the number of different arrangements = $\dfrac{12!}{3!\,3!\,3!\,3!}$

$$= \frac{12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3!}{3 \times 2 \times 3 \times 2 \times 3 \times 2 \times 3!}$$

$$= 369600.$$

Hence, the number of different possible arrangements are = 369600.

*********** END **********