



### Permutations Ex 16.5 Q10

There are 7 letters in the word 'ARRANGE' out of which 2 are A's 2 are R's and the rest are all distinct.

So, total number of words =  $\frac{7!}{2!2!}$

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

$$= 7 \times 6 \times 5 \times 2 \times 3$$

$$= 1260.$$

Considering all R's together and treating them as one letter we have 6 letters out of which A repeats 2 times and other are distinct. These 6 letters can be arranged in  $\frac{6!}{2!}$  ways.

So, the number of words in which all R's come together =  $\frac{6!}{2!}$

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

$$= 360.$$

Hence, the number of words in which all R's do not come together

= Total number of words – Number of words in which all R's come together

$$= 1260 - 360$$

$$= 900.$$

### Permutations Ex 16.5 Q11

Total number of digits = 5

Now, numbers greater than 50000 will have either 5 or 9 in the first place and will consist of 5 digits.

Number of numbers of which digit 5 at first place =  $\frac{4!}{2!}$  [ $\because$  1 is repeated]

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

$$= 12.$$

Number of numbers with digit 9 at first place =  $\frac{4!}{2!} = 12$

Hence, the required number of numbers =  $12 + 12 = 24$ .

### Permutations Ex 16.5 Q12

In the word 'SERIES' there are 6 letters of which 2 are S and 2 are E's.

Let us fix S at the extreme left and at the extreme right end. Now, we are left with 4 letters of which 2 are E's. These four letters can be arranged in  $\frac{4!}{2!}$  ways.

Hence, required number of arrangements =  $\frac{4!}{2!} = \frac{4 \times 3 \times 2!}{2!} = 12$ .

### Permutations Ex 16.5 Q13

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Total number of words that ends with letter I =  $\frac{8!}{2!}$

$$= 8 \times 7 \times 5 \times 6 \times 4 \times 3$$

$$= 56 \times 30 \times 12$$

$$= 20160$$

If the words starts with M and end with I , there are 7 space left for 7 letters.

Number of words that starts with M and end with I =  $\frac{7!}{2!}$

$$= 7 \times 5 \times 4 \times 3$$

$$= 42 \times 60$$

$$= 2520$$

Number of words which do not start with M but end with I

$$= 20160 - 2520$$

$$\text{Required number of words} = 17640$$

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