



Permutations Ex 16.2 Q17

We cannot have a 0 at the hundred's place. So, the hundred's place can be filled with any of the 9 digits 1, 2, 3, ..., 9.

So, there are 9 ways of filling the hundred's place.

Ten's place can be filled with any 10 digits in 10 ways.

Now, the unit's place can be filled with any 10 digits in 10 ways.

Hence, the total number of required numbers = $9 \times 10 \times 10 = 900$

Permutations Ex 16.2 Q18

The three digit numbers are 100 to 999 inclusive so there are
 $999 - 100 + 1 = 999 - 99 = 900$

So, 900 three digit numbers

If half of all numbers is odd then half of 900 is 450, there are 450 odd positive 3 digit numbers

Permutations Ex 16.2 Q19(i)

Zero cannot be first digit of the license plates.

This means the first digit can be selected from the 9 digits 1, 2, 3, 4, ..., 9
So, there are 9 ways of filling the first digit of the license plates.

Now, 9 digits are left including 0. So, second place can be filled with any of the remaining 9 digits in 9 ways.

The third place of the license plates can be filled with in any of the remaining 8 digits.
So, there are 8 ways of filling the third place.

The fourth place of the license plates can be filled with in any of the remaining 7 digits.
So, there are 7 ways at filling the fourth place.

The last place of the license plates can be filled with in any of the remaining 6 digits.
So, there are 6 ways of filling the fourth place.

Hence, the total number of ways = $9 \times 9 \times 8 \times 7 \times 6 = 27216$

Permutations Ex 16.2 Q19(ii)

Zero cannot be first digit of the license plates.

\therefore first digit can be selected from the 9 digits 1, 2, 3, ..., 9
So, there are 9 ways at filling the first digit of the licence plates.

The repetition of digits is allowed to made a license plates number.

\therefore the number of ways to fill the remaining places of the number
plates = $10 \times 10 \times 10 \times 10$.

Hence, the total number of ways = $9 \times 10 \times 10 \times 10 \times 10 = 90,000$

Permutations Ex 16.2 Q20

The required numbers are greater than 7000.

\therefore the thousand's place can be filled with any of the 3 digits 7, 8, 9.

so, there are 3 ways of filling the thousand's place.

Since repetition of digits is not allowed, so the hundred's, ten's and one's places can be filled in 4, 3, and 2 ways respectively.

Hence, the required number of numbers = $3 \times 4 \times 3 \times 2 = 72$

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