

SOLUTIONS TO NCERT TEXT BOOK EXERCISE 7.1

1. How many 3-digit numbers can be formed from the digits 1, 2, 3, 4 and 5 assuming that
- repetition of the digits is allowed?
 - repetition of the digits is not allowed?

(March 2013)

(September 2013)

Solution

- i. When repetition of digits is allowed, each of Hundred's place, Ten's place and unit's place can be filled in 5 ways.

H	T	U
5	5	5

∴ By the Fundamental Principle of Counting, the three digit numbers formed = $5 \times 5 \times 5 = 125$ ways

- ii. When repetition of digits is not allowed, first we fill Hundred's place. It can be filled by any of the 5 given digits in 5 ways. The Ten's place can be filled in 4 ways and the units' place can be filled in 3 ways.

H	T	U
5	4	3

∴ By the Fundamental Principle of Counting, the three digit numbers formed = $5 \times 4 \times 3 = 60$ ways

2. How many 3-digit even numbers can be formed from the digits 1, 2, 3, 4, 5, 6 if the digits can be repeated?

Solution

Since the number to be formed is even, the units' place can be filled by the digits 2, 4, or 6 i.e., in three ways. The ten's place and hundred's place can be filled in 6 ways since the digit can be repeated. Hence by the Fundamental Principle of Counting, the three places can be filled in $6 \times 6 \times 3 = 108$ ways.

H	T	U
6	6	3

∴ Required number of numbers = 108

3. How many 4-letter code can be formed using the first 10 letters of the English alphabet, if no letter can be repeated?

Solution

There are 10 letters, so the first place can be filled in 10 ways. Since no letter can be repeated the remaining

10	9	8	7
----	---	---	---

three places can be filled respectively in 9, 8, 7 ways. Therefore, by the Fundamental Principle of Counting, the four places can be simultaneously in $10 \times 9 \times 8 \times 7$ ways i.e., in 5040 ways.

\therefore Number of 4 letter codes = 5040

4. How many 5-digit telephone numbers can be constructed using the digits 0 to 9 if each number starts with 67 and no digit appears more than once? (March 2014)

Solution

There are 10 digits from 0 to 9, out of which 6 and 7 are fixed for first and second places i.e., the first and second places can be filled in way. Since no digit appears more than once, the third, fourth and fifth places can be filled respectively in 8, 7 and 6 ways. Hence by the Fundamental Principle of Counting, the five places can be filled in $1 \times 1 \times 8 \times 7 \times 6$ ways i.e., 336 ways.

\therefore The required number of telephone numbers = 336

