PROBABILITY

DIVYA SAI - FWC22094

16.4.10 [1] **The number lock of a suitcase has 4 wheels each labelled with ten digits i.e. from 0 to 9.The lock opens with a sequence of four digits with no repeats.What is the probability of a person getting the right sequence to open the suitcase?**

Solution:
There are 10 digits out of which 4 digits are to be chosen without repetition

Random variable	Value	Description
X	{1,2,3,4}	The number lock of a suitcase
Y	{0,1,2...9}	The digits labelled on each wheel

Table 2: Random variables X and Y

Wheel 1	Wheel 2	Wheel 3	Wheel 4
10 ways	9 ways	8 ways	7 ways

Table 4: Suitcase wheel

Example	Wheel	Outcome
1	8 6 4 2	Not repeating
2	8 4 2 6	Not repeating
3	1 2 3 4	Not repeating
4	8 8 8 8	Repeating
5	1 1 2 2	Repeating

Table 6: Combinations

Possible placement of digits are,

$$n(s) = n(X = 1) \times n(X = 2) \times n(X = 3) \times n(X = 4) = 10 \times 9 \times 8 \times 7 = 5040 \tag{16.4.10.1}$$

Let A be the event the correct sequence is selected So,n(A)=1.

The lock opens with only one right sequence.

Probability of correct sequence is selected as Pr(A),

[1] Read question numbers as (CHAPTER NUMBER).(EXERCISE NUMBER).(QUESTION NUMBER)

$$\Pr(A) = \frac{n(A)}{n(s)} = \frac{1}{5040} \tag{16.4.10.2}$$

The probability of getting the right sequence to open the suitcase is $\boxed{\frac{1}{5040}}$