

# Assignment 1

## NCERT Exemplar

Mohit Sahu  
EE22BTECH11034

### I. QUESTION 10.13.1.24

One ticket is drawn at random from a bag containing tickets numbered 1 to 40. The probability that the selected ticket has a number which is a multiple of 5 is (a)  $\frac{1}{5}$  (b)  $\frac{3}{5}$  (c)  $\frac{4}{5}$  (d)  $\frac{1}{3}$

*Solution:*

Let  $X_i$  be the sequence of independent Bernoulli random variables defined as:

$$X_i = \begin{cases} 1, & \text{if the number is a multiple of 5} \\ 0, & \text{if the number is not a multiple of 5} \end{cases}$$

There are a total of 8 numbers which are multiples of 5 in the range from 1 to 40. Therefore, the probability of selecting a number that is a multiple of 5 is calculated as:

$$\begin{aligned} p_X(1) &= \frac{\text{number of multiples of 5}}{\text{total possible outcomes}} \\ &= \frac{8}{40} \\ &= \frac{1}{5} \end{aligned}$$

Among the given options,  $\frac{1}{5}$  is the required solution. Therefore, the correct answer is option (a)  $\frac{1}{5}$ .