ASSIGNMENT 4 : CBSE PROBABILITY CLASS-10

AI21BTECH11016

EXERCISE 15.2 : Optional Problem - 3

Question:
A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball, determine the number of blue balls in the bag.

Solution:
Let X = $\{0, 1\}$ be a random variable representing the colour of the ball drawn.

Event	Description
X = 0	Colour of the ball is red
X = 1	Colour of the ball is blue

TABLE I

Let number of blue balls = b

$$\Pr(X = 0) = \frac{5}{5+b} \tag{1}$$

$$\Pr(X = 1) = \frac{b}{5+b} \tag{2}$$

Given, $\Pr(X = 1) = 2 \times \Pr(X = 0)$

$$\Rightarrow \frac{b}{5+b} = 2 \times \frac{5}{5+b} \tag{3}$$

$$5b + b^2 = 50 + 10b \tag{4}$$

$$(b+5)(b-10) = 0 \tag{5}$$

$\Rightarrow$ b = 10 i.e.,

The number of blue balls in the bag are 10.