Question 10.13.2.14

A bag contains slips numbered from 1 to 100. If Fatima chooses a slip at random from the bag, it will either be an odd number or an even number. Since this situation has only two possible outcomes, so, the probability of each is $\frac{1}{2}$.Justify.

Solution: Let

$$X = \begin{cases} 1, & \text{if number is even} \\ 0, & \text{if number is odd} \end{cases} \tag{1}$$

From 1 to 100, number of even numbers = number of odd numbers = 50. Then

$$P_X(1) = \frac{50}{100} \tag{2}$$

$$= \frac{1}{2} \tag{3}$$

Similarily

$$P_X(0) = \frac{50}{100} \tag{4}$$

$$= \frac{1}{2} \tag{5}$$