

## Chapter 25 Data Handling IV (Probability) Exercise – 25.1

### Question: 1

A coin is tossed 1000 times with the following frequencies:

Head: 445, Tail: 555

When a coin is tossed at random, what is the probability of getting?

(i). a head?

(ii). a tail?

### Solution:

Total number of times a coin is tossed = 1000

Number of times a head comes up = 445

Number of times a tail comes up = 555

$$(i) \text{ Probability of getting a head} = \frac{\text{No. of heads}}{\text{Total No. of trails}} = \frac{445}{1000} = 0.445$$

$$(ii) \text{ Probability of getting a tail} = \frac{\text{No. of tails}}{\text{Total No. of trails}} = \frac{555}{1000} = 0.555$$

### Question: 2

A die is thrown 100 times and outcomes are noted as given below:

Outcome:	1	2	3	4	5	6
Frequency:	21	9	14	23	18	15

If a die is thrown at random, find the probability of getting a/an:

(i) 3 (ii) 5 (iii) 4 (iv) Even number (v) Odd number (vi) Number less than 3.

### Solution:

Total number of trials = 100

Number of times "1" comes up = 21

Number of times "2" comes up = 9

Number of times "3" comes up = 14

Number of times "4" comes up = 23

Number of times "5" comes up = 18

Number of times "6" comes up = 15

$$(i) \text{ Probability of getting 3} = \frac{\text{Frequency of 3}}{\text{Total No. of trails}} = \frac{14}{100} = 0.14$$

$$(ii) \text{ Probability of getting 5} = \frac{\text{Frequency of 5}}{\text{Total No. of trails}} = \frac{18}{100} = 0.18$$

$$(iii) \text{ Probability of getting 4} = \frac{\text{Frequency of 4}}{\text{Total No. of trails}} = \frac{23}{100} = 0.23$$

(iv) Frequency of getting an even no. = Frequency of 2 + Frequency of 4 + Frequency of 6 = 9 + 23 + 15 = 47

$$\text{Probability of getting an even no.} = \frac{\text{Frequency of even number}}{\text{Total No. of trails}} = \frac{47}{100} = 0.47$$

(v) Frequency of getting an odd no. = Frequency of 1 + Frequency of 3 + Frequency of 5 = 21 + 14 + 18 = 53

$$\text{Probability of getting an odd no.} = \frac{\text{Frequency of odd number}}{\text{Total No. of trails}} = \frac{53}{100} = 0.53$$

(vi) Frequency of getting a no. less than 3 = Frequency of 1 + Frequency of 2 = 21 + 9 = 30

$$\text{Probability of getting a no. less than 3} = \frac{\text{Frequency of number less than 3}}{\text{Total No. of trails}} = \frac{30}{100} = 0.30$$

### Question: 3

A box contains two pair of socks of two colours (black and white). I have picked out a white sock. I pick out one more with my eyes closed. What is the probability that I will make a pair?

#### Solution:

No. of socks in the box = 4

Let B and W denote black and white socks respectively. Then we have:

$$S = \{B, B, W, W\}$$

If a white sock is picked out, then the total no. of socks left in the box = 3

No. of white socks left = 2 - 1 = 1

$$\text{Probability of getting a white sock} = \frac{\text{no. of white socks left in the box}}{\text{total no. of socks left in the box}} = \frac{1}{3}$$

### Question: 4

Two coins are tossed simultaneously 500 times and the outcomes are noted as given below:

If same pair of coins is tossed at random, find the probability of getting:

(i) Two heads (ii) One head (iii) No head.

#### Solution:

Number of trials = 500

Number of outcomes of two heads (HH) = 105

Number of outcomes of one head (HT or TH) = 275

Number of outcomes of no head (TT) = 120

$$\text{(i) Probability of getting two heads} = \frac{\text{Frequency of getting 2 heads}}{\text{Total No. of trails}} = \frac{105}{500} = \frac{21}{100}$$

$$\text{(ii) Probability of getting one head} = \frac{\text{Frequency of getting 1 heads}}{\text{Total No. of trails}} = \frac{275}{500} = \frac{11}{20}$$

$$\text{(iii) Probability of getting no head} = \frac{\text{Frequency of getting no heads}}{\text{Total No. of trails}} = \frac{120}{500} = \frac{6}{25}$$