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 Probability of getting a head $= \frac{\text{Number of heads}}{\text{Total no. of trails}} = \frac{445}{1000} = 0.445$

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

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 Probability of getting 3

$$=\frac{\text{frequency of 3}}{\text{Total no. of trails}} = \frac{14}{100} = 0.14$$

ii Probability of getting 5

$$=\frac{\text{frequency of 5}}{\text{Total no. of trails}} = \frac{18}{100} = 0.18$$

iii 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

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

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

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

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

Probability of getting a no. less than 3

$$=\frac{\text{frequency of no. less than 3}}{\text{Total no. of trails}} = \frac{30}{100} = 0.30$$

Question:3
A box contains two pair of socks of two colours $blackandwhite$. 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

Probability of getting a white sock

$$=\frac{\text{Number of white socks left in the box}}{\text{Total no. of socks left in the box}}=\frac{1}{3}$$

Question:4

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

Outcome:	Two heads HH	One head $HT\,or\,TH$	No head TT
Frequency:	105	275	120

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

i Probability of getting two heads $=\frac{\text{frequency of getting 2 heads}}{\text{Total number of trails}}=\frac{105}{500}=\frac{21}{100}$

ii Probability of getting one head $=\frac{\text{frequency of getting 1 head}}{\text{Total number of trails}}=\frac{255}{500}=\frac{11}{20}$

iii Probability of getting no head $=\frac{\text{frequency of getting no head}}{\text{Total number of trails}}=\frac{120}{500}=\frac{6}{25}$

Question:5

An unbiased coin is tossed once, the probability of getting head is

$a\ \frac{1}{2}$ $\qquad\qquad b\ 1$ $\qquad\qquad c\ \frac{1}{3}$ $\qquad\qquad d\ \frac{1}{4}$

Solution:

Tossing a coin, either we get a head H or a tail T. So, the probability of getting a head is $\frac{1}{2}$. Hence, the correct option is a.

Question:6

There are 10 cards numbered from 1 to 10. A card is drawn randomly. The probability of getting an even numbered card is

$a\ \frac{1}{10}$ $\qquad\qquad b\ \frac{1}{5}$ $\qquad\qquad c\ \frac{1}{2}$ $\qquad\qquad d\ \frac{2}{5}$

Solution:

The number on the cards are 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

The even numbers on the cards are 2, 4, 6, 8, 10.

∴ Probability of getting an even numbered card = $\frac{\text{Number of even numbered card}}{\text{Number of cards with numbers from 1 to 10}}$

$$= \frac{5}{10} = \frac{1}{2}$$

Hence, the correct option is c.

Question:7

A dice is rolled. The probability of getting an even prime is

a $\frac{1}{6}$ $\qquad\qquad$ b $\frac{1}{3}$ $\qquad\qquad$ c $\frac{1}{2}$ $\qquad\qquad$ d $\frac{5}{6}$

Solution:

The possible numbers on a dice are 1, 2, 3, 4, 5, 6.

There is only one even prime number which is 2.

∴ Probability of getting an even prime = $\frac{\text{Number of even prime numbers}}{\text{Number of all possible outcomes on the dice}} = \frac{1}{6}$

Hence, the correct option is a.

Question:8

There are 100 cards numbered from 1 to 100 in a box. If a card is drawn from the box and the probability of an event is $\frac{1}{2}$, then the number of favourable cases to the event is

a 20 $\qquad\qquad$ b 25 $\qquad\qquad$ c 40 $\qquad\qquad$ d 50

Solution:

Here, $\frac{50}{100} = \frac{1}{2}$.

So, if the the probability of an event is $\frac{1}{2}$, then the number of favourable cases has to be 50.

Hence, the correct option is d.

Question:9

When a dice is thrown, the total number of possible outcomes is

a 6 $\qquad\qquad$ b 1 $\qquad\qquad$ c 3 $\qquad\qquad$ d 4

Solution:

The number on the faces of a dice are 1, 2, 3, 4, 5, and 6.

∴ Number of possible outcomes = 6

Hence, the correct option is a.

Question:10

There are 10 marbles in a box which are marked with the distinct numbers from 1 to 10.
A marble is drawn randomly. The probability of getting prime numbered marble is

$a\ \frac{1}{2}$ $b\ \frac{2}{5}$ $c\ \frac{9}{3}$ $d\ \frac{3}{10}$

Solution:

The numbers marked on the marbles are 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10.
Here, the prime numbers $favourable outcomes$ are 2, 3, 5, and 7.
∴ Number of favourable outcomes = 4
Therefore
Probability of getting prime numbered marble = $\frac{4}{10} = \frac{2}{5}$
Hence, the correct option is b.

Question:11

The probability of getting a red card from a well shuffled pack of cards is

$a\ \frac{1}{4}$ $b\ \frac{1}{2}$ $c\ \frac{3}{4}$ $d\ \frac{1}{3}$

Solution:

There are 52 cards in a standard deck. There are four different suits Diamonds red, Clubs $black$
, Hearts red, and Spades $black$ each containing 13 cards.
∴ Number of red cards $favourable outcomes$ = 13 + 13 = 26
Therefore
Probability of getting a red card = $\frac{26}{52} = \frac{1}{2}$
Hence, the correct option is b.

Question:12

A coin is tossed 100 times and head is obtained 59 times. The probability of getting a tail is

$a\ \frac{59}{100}$ $b\ \frac{41}{100}$ $c\ \frac{29}{100}$ $d\ \frac{43}{100}$

Solution:

Number of all possible outcomes = 100
Number of head obtained = 59
Number of tail obtained $favourable outcomes$ = 100 − 59 = 41
Therefore

Probability of getting a tail = $\frac{41}{100}$

Hence, the correct option is b.

Question:13

A dice is tossed 80 times and number 5 is obtained 14 times. The probability of not getting the number 5 is

a $\frac{7}{40}$ $\qquad$ b $\frac{7}{80}$ $\qquad$ c $\frac{33}{40}$ $\qquad$ d None of these

Solution:

Probability of getting 5 = $\frac{14}{80} = \frac{7}{40}$

Therefore

Probability of not getting 5 = $1 - \frac{7}{40} = \frac{33}{40}$

Hence, the correct option is c.

Question:14

A bag contains 4 green balls, 4 red balls and 2 blue balls. If a ball is drawn from the bag, the probability of getting neither green nor red ball is

a $\frac{2}{5}$ $\qquad$ b $\frac{1}{2}$ $\qquad$ c $\frac{4}{5}$ $\qquad$ d $\frac{1}{5}$

Solution:

The probability of getting neither green nor red ball is equal to the probability of getting blue balls.

Number of blue balls = 2

Total number of balls = 4 + 4 + 2 = 10

Therefore

Probability of getting neither green nor red ball = $\frac{2}{10} = \frac{1}{5}$

Hence, the correct option is d.