Probability

Exercise 15A

Question 1:

Total numbers of trials = 500
Numbers of heads = 285
Numbers of tails = 215

(i) Let E be the event of getting a head

$$\therefore P(\text{getting a head}) = P(E) = \frac{\text{numbers of heads coming up}}{\text{total number of trials}}$$

$$= \frac{285}{500} = 0.57$$

(ii) Let F be the event of getting a tail

$$\therefore P(\text{getting a tail}) = P(F) = \frac{\text{numbers of tails coming up}}{\text{total number of trials}}$$

$$= \frac{215}{500}$$

$$= 0.43$$

Question 2:

Total numbers of trials = 400
Numbers of times 2 head appears = 112
Number of times 1 head appears = 160
Number of times 0 head appears = 128

In a random toss of two coins , Let E_1, E_2, E_3, be the events of

$$P(\text{getting 2 heads}) = P(E_1) = \frac{\text{numbers of times 2 heads appear}}{\text{total number of trials}} = \frac{112}{400} = 0.28$$

$$P(\text{getting 1 head}) = P(E_2) = \frac{\text{numbers of times 1 head appears}}{\text{total number of trials}} = \frac{160}{400} = 0.4$$

$$P(\text{getting 0 head}) = P(E_3) = \frac{\text{numbers of times 0 head appears}}{\text{total number of trials}} = \frac{128}{400} = 0.32$$

Question 3:

Total number of trials=200

Number of times 3 heads appeared=39

Number of times 2 heads appeared = 58

Number of times 1 head appeared =67

Number of times 0 head appeared=36

The random toss of 3 coins , Let E1, E2, E3 and E4 be the events of getting 3 heads , 1 head and 0 head and 2 heads respectively . Then;

(i) P(getting 3 heads)=P(E_1)=

$$\frac{\text{numbers of times 3 head appeared}}{\text{total number of trials}}$$

$$=\frac{39}{200}$$

$$=0.195$$

(ii) P (getting 1 head)= P(E_2)=

$$\frac{\text{numbers of times 1 head appeared}}{\text{total number of trials}}$$

$$=\frac{67}{200}$$

$$=0.335$$

(iii) P(getting 0head)= P(E_3)=

$$\frac{\text{numbers of times 0 head appeared}}{\text{total number of trials}}$$

$$=\frac{36}{200}$$

$$=0.18$$

(iii) P(getting 2heads)= P(E_4)=

$$\frac{\text{numbers of times 2head appeared}}{\text{total number of trials}}$$

$$=\frac{58}{200}$$

$$=0.29$$

Question 4:

Total number of trials =300
In a random throw of a die let E_1, E_2, E_3, and E_4 be the events of 3,6,5, and 1 respectively .Then;

(i) P(getting 3)= $P(E_1)$=

$$\frac{\text{numbers of times 3 appeared}}{\text{total number of trials}}$$

$$=\frac{54}{300}$$

$$=0.18$$

(ii) P(getting 6)= $P(E_2)$=

$$\frac{\text{numbers of times 6 appeared}}{\text{total numberof trials}}$$

$$=\frac{33}{300}$$

$$=0.11$$

(iii) P(getting 5)= $P(E_3)$=

$$\frac{\text{numbers of times 5 appeared}}{\text{total number of trials}}$$

$$=\frac{39}{300}$$

$$=0.13$$

(iv) P(getting 1)= $P(E_4)$=

$$\frac{\text{numbers of times 2 head appeared}}{\text{total number of trials}}$$

$$=\frac{60}{300}$$

$$=0.2$$

Question 5:

The number of ladies =200

Number of ladies who like coffee =142

Number of ladies who do not like coffee=58

Let E1= event that the selected lady likes coffee.

$$\therefore P(E1)=\frac{\text{numbers of ladies who like coffee}}{\text{total number of trials}}=\frac{142}{200}=0.71$$

Let (E2)= event that the selected lady dislikes coffee, Then

$$\therefore P(E2)=\frac{\text{numbers of ladies who dislike coffee}}{\text{total number of trials}}=\frac{58}{200}=0.29$$

Question 6:

Number of tests in which he gets more than 60% marks =2

Total numbers of tests =6

∴ Required probability

$$= \frac{\text{numbers of tests in which he gets more than 60\% marks}}{\text{total number of trials}}$$

$$= \frac{2}{6} = \frac{1}{3}$$

Question 7:

Total numbers of vehicles = 240

Numbers of two wheelers = 84

∴ Required probability

$$= \frac{\text{numbers of two wheelers}}{\text{total number of vehicles}}$$

$$= \frac{84}{240}$$

$$= 0.35$$

Question 8:

Total phone numbers = 200

Numbers of phone numbers with unit digit 5 = 24

∴ Required probability

$$= \frac{\text{numbers of phone numbers with units digits 5}}{\text{total number of numbers}}$$

$$= \frac{24}{200}$$

$$= 0.12$$

Numbers of phone numbers with units digit 8 = 16

∴ Required probability

$$= \frac{\text{numbers of phone numbers with units digits 8}}{\text{total number of phone numbers}}$$

$$= \frac{16}{200}$$

$$= 0.08$$

Question 9:

Total number of students=40

(i)Numbers of students having blood groupO = 14

∴ Required probability

$$= \frac{\text{numbers of students having blood group O}}{\text{total number of students}} = \frac{14}{40} = 0.35$$

(ii) Numbers of students having blood groupAB = 6

∴ Required probability

$$= \frac{\text{numbers of students having blood group AB}}{\text{total number of students}} = \frac{6}{40} = 0.15$$

Question 10:

Total numbers of students =30

Numbers of students who lie in the interval21-30=6

∴ Required probability

$$= \frac{\text{numbers of students in the interval}}{\text{total number of students}} = \frac{6}{30} = 0.2$$

Question 11:

Total number of patients=360

(i)P (getting a patient of age 30 years or more but less than 40 years)$=\frac{60}{360}=\frac{1}{6}$

(ii)P (getting a patient of age 50 years or more but less than 70 years)

$=\left(\frac{50+30}{360}\right)=\frac{80}{360}=\frac{2}{9}$

(iii) P (getting a patient of age less than 10 years) $=\frac{0}{360}=0$

(iv) P (getting a patient of age 10 years or more) $=\frac{360}{360}=1$