

Unit No. 13

Probability

Review Exercise No. 13

Question No.1

Four options are given against each statement. Encircle the correct option.

(i) Each element of the sample space is called:

- (a) event
- (b) experiment
- (c) sample point**
- (d) outcomes

(ii) An outcome which represents how many times we expect the things to be happened is called:

- (a) outcomes
- (b) favourable outcome**
- (c) sample space
- (d) sample point

(iii) Which one tells us how often a specific event occurs .Relative to the total number of frequency event or trials?

- (a) expected frequency
- (b) sum of relative frequency
- (c) relative frequency**
- (d) frequency

(iv) Estimated probability of an event occurring is also, known as:

- (a) relative frequency**
- (b) expected frequency
- (c) class boundaries
- (d) sum of expected frequency

(v) The sum of all expected frequencies is equal to the fixed number of:

- (a) trials**
- (b) relative frequencies
- (c) outcomes
- (d) events

(vi) The chance of occurrence of a particular event is called:

- (a) sample space
- (b) estimated probability
- (c) probability**
- (d) expected frequency

(vii) An event which will probably occur. It has greater chance to occur is called:

- (a) equally likely event

(b) likely event

(c) unlikely event

(d) certain event

(viii) Find out the total number of possible sample space when 4 dice are rolled:

(a) 6^2

(b) 6^3

(c) 6^4

(d) 6^6

(ix) While rolling a pair of dice, what will be the probability of double 2?

(a) $\frac{1}{6}$

(b) $\frac{1}{3}$

(c) $\frac{5}{6}$

(d) $\frac{1}{36}$

(x) A card is chosen from a pack of 52 playing cards, find the probability of getting no jack and king:

(a) $\frac{2}{13}$

(b) $\frac{11}{13}$

(c) $\frac{2}{52}$

(d) $\frac{11}{52}$

Question No. 2

Define the following:

(i) Relative Frequency:

Relative frequency is an estimated probability of an event occurring when an experiment is repeated a fixed number of times.

(ii) Expected Frequency:

Expected frequency is a measure that often an event should be occurred probability. Expected frequency is found by using the following method.

Expected frequency = Total number of trials \times probability of event = $N \times P(A)$

Question No. 3

An urn contains 10 red-balls; 5 green balls and 8 blue balls. Find the probability of selecting at random.

(i) a green ball

(ii) a red ball

(iii) a blue ball

(iv) not a red ball

(v) not a green ball

Solution:

No. red balls = $n(R) = 10$

No of green balls = $n(G) = 5$

No of blue balls = $n(B) = 8$

(i) probability of selecting at random a green ball = ?

Total no. of balls = $10 + 5 + 8$

$n(T) = 23$

1) Probability of selecting green ball:

$$P(G) = \frac{n(G)}{n(T)}$$

$$P(G) = \frac{5}{23}$$

2) Probability of selecting red ball:

$$P(R) = \frac{n(R)}{n(T)}$$

$$P(R) = \frac{10}{23}$$

3) Probability of selecting blue ball:

$$P(B) = \frac{n(B)}{n(T)}$$

$$P(B) = \frac{8}{23}$$

4) Probability of selecting not a red ball:

$$= 1 - P(R)$$

$$= 1 - \frac{10}{23}$$

$$= \frac{(23 - 10)}{23}$$

$$= \frac{13}{23}$$

5) Probability of selecting not a green ball:

$$= 1 - P(G)$$

$$= 1 - \frac{5}{23}$$

$$= \frac{(23 - 5)}{23}$$

$$= \frac{18}{23}$$

Question No. 4

Three coins are tossed together, what is the probability of getting:

(i) exactly three heads

Solution:

Possibilities = [HHH, HHT, HTH, THH, TTH, THT, HTT, TTT]

No. of favourable outcomes = $n(A) = 1$

Possible outcomes = $n(S) = 8$

$$P(A) = \frac{n(A)}{n(S)} = \frac{1}{8}$$

(ii) at least two tails:

Solution:

Possibilities = [TTH, THT, HTT, TTT]

No. of favourable outcomes = $n(A) = 4$

Possible outcomes = $n(S) = 8$

Probability = $n(A) / n(S) = 4 / 8 = 1 / 2$

(iii) not at least two heads:

Solution:

Possibilities = [HHH, TTH, THT, HTT]

No. of favourable outcomes = $n(A) = 4$

Possible outcomes = $n(S) = 8$

Probability = $n(A) / n(S) = 4 / 8 = 1 / 2$

(iv) not exactly two heads:

Solution:

Possibilities = [HHH, TTH, THT, HTT, TTT]

No. of favourable outcomes = $n(A) = 5$

Possible outcomes = $n(S) = 8$

Probability = $n(A) / n(S) = 5 / 8$

Question No. 5

A card is drawn from a well shuffled pack of 52 playing cards. What will be the probability of getting;

(i) king or jack of red colour:

Solution:

There are 2 red jacks and 2 kings out of 52 cards:

So, probability = $(2+2) / 52 = 4 / 52 = 1 / 13$

(ii) not "2" of club and spade:

Solution:

Probability of (not "2" to club and spade) = $50 / 52 = 25 / 26$

Question No. 6:

x	P(x)
0	110
1	90
2	105

Six coins are tossed 600 times. The tails are recorded and shown in the table

3	80
4	76
5	123
6	16

number of occurrence of given below:

Find the relative frequency of given table.

Solution:

x	P(x)	Relative Frequency
0	110	$\frac{110}{600} = \frac{11}{60}$
1	90	$\frac{90}{600} = \frac{3}{20}$
2	105	$\frac{105}{600} = \frac{7}{40}$
3	80	$\frac{80}{600} = \frac{2}{15}$
4	76	$\frac{76}{600} = \frac{19}{150}$
5	123	$\frac{123}{600} = \frac{41}{200}$
6	16	$\frac{16}{600} = \frac{2}{75}$
	$\Sigma f = 600$	

Question No. 7

From a lot containing 25 items, 8 items are defective. Find the relative frequency of non-defective items, also find the expected frequency of non-defective items.

Solution:

No. of items = $n(S) = 25$

No. of defective items = $n(A) = 8$

No. of non-defective items = $n(B) = 25 - 8 = 17$

Relative frequency of non-defective items = $\frac{17}{25} = 0.68$

Expected frequency of non-defective items = 17