CBSE Test Paper 03

CH-15 Probability

1. Probability of getting two heads in a simultaneous throw of 3 coins is

   a. $\frac{7}{8}$

   b. $\frac{3}{8}$

   c. $\frac{1}{8}$

   d. $\frac{5}{8}$

2. Two dice are thrown simultaneously. The probability of getting a multiple of 2 on one die and a multiple of 3 on the other one is

   a. $\frac{11}{36}$

   b. $\frac{5}{12}$

   c. $\frac{1}{12}$

   d. $\frac{5}{36}$

3. What is the probability of a number greater than 6 for a single throw of a die?

   a. 1

   b. None of these

   c. $\frac{1}{2}$

   d. 0

4. If $P(E) = \frac{3}{4}$ what is value of $P\left(\overline{E}\right)$.

   a. None of these

   b. 1

c. $\frac{3}{4}$

d. $\frac{1}{4}$

5. A number x is chosen at random from - 5, - 4, - 3, - 2, - 1, 0, 1, 2, 3, 4, 5. The probability that $|x| \leq 4$ is :

   a. $\frac{6}{11}$

   b. $\frac{7}{11}$

   c. $\frac{3}{11}$

   d. $\frac{9}{11}$

6. Fill in the blanks: Let $\overline{x}$ is the arithmetic mean of n observations x_1, x_2, x_3, ...x_n, If each observation is decreased by p, then the mean of new observation is _____.
7. Fill in the blanks: The probability that a prime number selected at random from the numbers (1,2,3, ...35) is _____.
8. In a throw of a die, find the probability of getting an even number.
9. In a cricket match, a batsman hits a boundary 8 times out of 40 balls he plays. Find the probability that he didn't hit a boundary.
10. In a survey of 364 children aged 19 - 36 months, it was found that 91 liked to eat potato chips. If a child is selected at random. Find the probability that he/she does not like to eat potato chips.
11. A die was rolled 100 times and the number of times 6 came up was noted. If the experimental probability calculated from this information is $\frac{2}{5}$ then how many times 6 came up?
12. The blood groups of 30 students of a class are given.Use this data to determine the probability that a student of this class, selected at random, has blood group AB."The blood groups of 30 students of Class VIII are recorded as follows :A, B, O, O, AB, O, A, O, B, A, O, B, A, O, O,A, AB, O, A, A, O, O, AB, B, A, O, B, A, B, O."
13. The percentage of marks obtained by a student in monthly unit tests are given below.

Test	I	II	III	IV	V	VI
Percentage of marks	52	60	65	75	80	72

Find the probability that in the next test the student gets

i. more than 70% marks,

ii. less than 70% marks,

iii. at least 60% marks.

14. The following table gives the lifetime of 400 neon lamps:

Lifetime (in hours)	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
Number of lamps	14	56	60	86	74	62	48

A bulb is selected at random. Find the probability that the lifetime of the selected bulb is:

i. less than 400

ii. between 300 to 800 hours

iii. at least 700 hours

15. The weekly pocket expenses of students are given below:

POCKET EXPENSES (in Rs.)	45	40	59	71	58	47	65
NO. OF STUDENTS	7	4	10	6	3	8	1

Find the probability that the weekly pocket expenses of a student are

(a) (i) ₹59

(ii) more than ₹ 59

(iii) less than ₹ 59

(b) Find the sum of probabilities computed in (i), (ii), and (iii)

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Solution

1. (b) $\frac{3}{8}$

   Explanation: Number of possible outcomes in in a simultaneous throw of 3 coins = { HHH, HHT, HTH, THH, HTT, THT, TTH, TTT } = 8 Number of favourable outcomes of getting two heads {HHT, HTH, THH} = 3 So, the probability of getting two heads in a simultaneous throw of 3 coins = $\frac{3}{8}$

2. (a) $\frac{11}{36}$

   Explanation: Two different dice are thrown simultaneously being number 1, 2, 3, 4, 5 and 6 on their faces. We know that in a single thrown of two different dice, the total number of possible outcomes is (6 × 6) = 36. Let E = event of getting a multiple of 2 on one die and a multiple of 3 on the other die.

   The events of a multiple of 2 on one die and a multiple of 3 on the other die will be E = [(2, 3), (2, 6), (3, 2), (3, 4), (3, 6), (4, 3), (4, 6), (6, 2), (6, 3), (6, 4), (6, 6)] = 11

   Therefore, probability of getting 'a multiple of 2 on one die and a multiple of 3 on the other die'

   P(E) = Number of favourable outcomes / Total number of possible outcome = $\frac{11}{36}$

3. (d) 0

   Explanation: Total possible outcomes = 6

   Numbers greater than 6 in a die = 0

   Probability of a number greater than 6 for a single throw of a die = 0/6 = 0

4. (d) $\frac{1}{4}$

   Explanation:

   If $P(E) = \frac{3}{4}$

   Therefore, $P\left(\overline{E}\right)$ = 1 - $\frac{3}{4}$ = $\frac{1}{4}$

5. (d) $\frac{9}{11}$
   Explanation: Number of favourable outcomes = 11

   Number of outcomes favourable to the event, | x| $\leq$4 = {-4, -3 ,-2, -1,0,1, 2, 3, 4} = 9

   Therefore, the probability that | x| $\leq$4 = $\frac{9}{11}$

6. ($\overline{x}$ - p)

7. $\frac{11}{35}$

8. Total even number on a die = 3
   P (getting an even numbers) = $\frac{3}{6} = \frac{1}{2}$

9. Let A denote the event that the batsman did not hit a boundary.
   We have, Total number of trials = 40
   Number of trials in which the event A happened = 40 - 8 = 32
   $\therefore$ P(A) = $\frac{32}{40}$ = $\frac{4}{5}$ = 0.8

10. Children who do not like potato chips $= 364 - 91 = 273$
    P (a child does not like potato chips) = $\frac{273}{364} = 0.75$

11. The probability of an event = $\frac{\text{Frequency of the event occurring}}{\text{The total number of trials}}$
    $\therefore \frac{2}{5} = \frac{x}{100}$ i.e, $x = 40$

12. Total number of students = 30
    Number of students having blood groups AB = 3
    $\therefore$ Probability that a student of this class, selected at random, has blood group AB $= \frac{3}{30} = \frac{1}{10} = 0.1$

13. i. Number of tests in which the student scored more than 70% marks = 3
       $\therefore$ P (more than 70% marks) $\frac{3}{6} = \frac{1}{2}$
    ii. Number of tests in which the student scored less than 70% marks = 3
       $\therefore$ P (less than 70% marks) $\frac{3}{6} = \frac{1}{2}$
    iii. Number of tests in which the student scored at least 60% marks = 5
       $\therefore$ P (at least 60% marks) = $\frac{5}{6}$

14. It is given that the total number of light bulbs = 400

Now, let's find the probability of the given events,

i. The probability that the life time of the selected bulb is less than 400 hours
$= \frac{Favourable\ outcome}{Total\ outcome} = \frac{14}{400} = \frac{7}{200}$

ii. The probability that the life time of the selected bulb is between 300 to 800 hours
$= \frac{Favourable\ outcome}{Total\ outcome} = \frac{14+56+60+86+74}{400} = \frac{290}{400} = \frac{29}{40}$

iii. The probability that the life time of the selected bulb is at least 700 hours
$= \frac{Favourable\ outcome}{Total\ outcome} = \frac{74+62+48}{400} = \frac{184}{400} = \frac{23}{50}$

15. (a) No. of students = 39

∴ No. of trials = 39

(i) Number of students with weekly pocket expenses of ₹59 = 10

∴P (the weekly pocket expenses of a student are Rs 59) $= \frac{10}{39}$

(ii) No. of students with weekly pocket expenses of more than ₹ 59 = 6+1=7

∴P (the weekly pocket expenses of a student are more than ₹59) $= \frac{7}{39}$

(iii) Number of students with weekly pocket expenses of less than ₹ 59

$= 7 + 4 + 3 + 8 = 22$

∴P (the weekly pocket expenses of a student are less than ₹59) $= \frac{22}{39}$

(b) Sum of probabilities in (i),(ii), and (iii)

$= \frac{10}{39} + \frac{7}{39} + \frac{22}{39} = \frac{39}{39} = 1$