CBSE Test Paper 04

CH-15 Probability

1. In a single throw of a pair of dice, the probability of getting the sum as a perfect square is :

   a. $\frac{8}{36}$

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

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

   d. $\frac{7}{36}$

2. One ticket is drawn at random from a bag containing tickets numbered 1 to 40. The probability that the selected ticket has a number which is a multiple of 5, is

   a. $\frac{1}{5}$

   b. $\frac{3}{5}$

   c. $\frac{1}{3}$

   d. $\frac{4}{5}$

3. A and B throw a pair of dice. If A throws 9, then B's chance of throwing a higher number is

   a. $\frac{1}{6}$

   b. $\frac{1}{3}$

   c. $\frac{1}{9}$

   d. $\frac{2}{9}$

4. Performing an experiment once is called

   a. none of these

b. Probability

c. Event

d. Trial

5. Five cards – nine, ten, jack, queen and king of hearts are well-shuffled with their faces downwards. One card is picked at random. The probability that the drawn card is a king, is :

   a. $\frac{1}{5}$

   b. $\frac{2}{5}$

   c. $\frac{4}{5}$

   d. $\frac{3}{5}$

6. Fill in the blanks: A mathematics book contains 250 pages. A page is selected at random. Probability that the number on the page selected is a perfect square is _____.
7. Fill in the blanks: A possible outcome or combination of outcomes is called an _____.
8. In a medical examination of students of a class, the following blood groups are recorded:

Blood group	A	AB	B	O
Number of students	10	13	12	5

   A student is selected at random from the class. Find the probability that he/she has blood group B.

9. In a cricket match, Shane Warne takes three wickets from every 27 balls he bowled. Find the probability of a batsman not getting out by Shane Warne's bowling.
10. In a cricket match, a batswoman hits a boundary 6 times out of 30 balls she plays. Find the probability that she did not hit a boundary.
11. A survey was conducted in a locality regarding the eating habits of persons. Out of 450

persons, if 175 found to be pure vegetarian, what is the probability of person, selected at random of being non-vegetarian?

12. A coin is tossed 1000 times with the following frequencies:
    Head: 455, Tail: 545
    Compute the probability for each event.
13. A die is thrown once. Find the probability of getting
    (i) a prime number
    (ii) a number less then 5
14. 1500 families with 2 children were selected randomly and the following data were recorded

No. of girls in a family	**No. of families**
2	475
1	814
0	211

    Compute the probability of a family, chosen at random, having.
    (i) 2 girls
    (ii) 1 girl
    (iii) No girl
    Also, check the sum of these probabilities
15. Fifty seeds were selected at random from each of 5 bags of seeds and were kept under standardised condition favourable to germination. After 20 days, the number of seeds which had germinated in each collection were counted and recorded as follows.

Bag	1	2	3	4	5
No. of seeds germinated	40	48	42	39	41

    What is the probability of germination of
    (i) More than 40 seeds in a bag
    (ii) 49 seeds in a bag
    (iii) More than 35 seeds in a bag

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Solution

1. (d) $\frac{7}{36}$

   Explanation: Total possible outcomes = 36 Number of favourable outcomes of getting the sum as a perfect square = { (1,3) , (2,2) ,(3,1) ,(3,6) ,(4,5) ,(5,4) ,(6,3)} = 7 Therefore, the probability of getting the sum as a perfect square = $\frac{7}{36}$
2. (a) $\frac{1}{5}$

   Explanation: Number of possible outcomes = 40 Multiples of five between 1 to 40 = {5,10,15,20,25,30,35,40} = 8 Therefore, number of favourable outcomes = 8 So, the probability that the selected ticket has a number which is a multiple of 5 = $\frac{8}{40}$ = $\frac{1}{5}$
3. (a) $\frac{1}{6}$

   Explanation: Given that 'A' throws 9 and B throws a higher number than 9 That is B throws 10 or 11 or 12

   Total number of outcomes on throwing 2 dices = 6 × 6 = 36

   Favourable outcomes are: {(4,6) (5,5), (6,4), (5,6), (6,5), (6,6)}

   Number of favourable outcomes = 6

   ∴ Probability of B throwing a number greater than 9 = $\frac{6}{36}$ = $\frac{1}{6}$
4. (d) Trial

   Explanation: By a trial, we mean performing a random experiment. For example; throwing a die or tossing a coin etc.
5. (a) $\frac{1}{5}$

   Explanation: Total number of possible outcomes = 5 Number of Kings = 1

   The probability that the drawn card is a king = $\frac{1}{5}$
6. $\frac{3}{50}$
7. event
8. Total number of students = 10+13+12+5=40

   P (a student has blood group B) = $\frac{12}{40} = \frac{3}{10}$
9. The probability of batsman getting out by Shane Warne's bowling = $\frac{3}{27}$ = $\frac{1}{9}$

Now, the probability of batsman not getting out by Shane Warne's bowling
= 1 - P(Batsman getting out) = 1 - $\frac{1}{9}$ = $\frac{8}{9}$

10. Let E be the event of hitting the boundary.
    Then,
    $P(E) = \frac{Number\ of\ times\ the\ batswoman\ hits\ the\ boundary}{Total\ number\ of\ balls\ she\ plays}$
    $= \frac{6}{30} = \frac{1}{5} = 0.2$
    ∴ Probability of not hitting the boundary
    = 1– Probability of hitting the boundary
    = 1– P(E)= 1 – 0.2= 0.8

11. Number of pure vegetarians $= 175$
    ∴ Number of non-vegetarians $= 450 - 175 = 275$
    P(a person being non-vegetarian) = $\frac{275}{450} = \frac{11}{18}$

12. Since the coin is 1000 times, the total number of trials is 1000. Let us call the events of getting a head and of getting a tail as E and F, respectively.
    Then, the number of times E happens, i.e., the number of times a head come up, is 455.
    So, the probability of E = $\frac{\text{Number of heads}}{\text{Total number of trials}}$
    i.e., P(E) = $\frac{455}{1000}$ = 0.455
    Similarly, the probability of the event of getting a tail = $\frac{\text{Number of tails}}{\text{Total number of trials}}$
    i.e., P(F) = $\frac{545}{1000}$ = 0.545
    Note that, P(E) + P(F) = 0.455 + 0.545 = 1 and E and F are the only two possible outcomes of each trial.

13. When a die is thrown, then outcomes are 1, 2, 3, 4, 5, 6
    (i)Prime numbers are = 2, 3, 5
    ∴ Frequency of happening prime number is 3
    ∴ The probability of getting prime number = $\frac{3}{6} = \frac{1}{2}$
    (ii)Numbers less than 5 are 1, 2, 3, 4
    ∴ Frequency of happening of a no. less than 5 is 4
    ∴Probability of getting a number less than 5

$= \frac{4}{6} = \frac{2}{3}$

14. (i)Total no. of Families = 1500

    No. of family having 2 girls = 475

    $P(E) = \frac{475}{1500} = \frac{95}{300} = \frac{19}{60}$

    (ii)No. of families having 1 girl = 814

    $P(E) = \frac{814}{1500} = \frac{407}{750}$

    (iii)No. of families having no girl = 211

    $P(E) = \frac{211}{1500}$

    Sum of these three probabilities = $\frac{475}{1500} + \frac{814}{1500} + \frac{211}{1500}$

    = $\frac{475+814+211}{1500}$

    = $\frac{1500}{1500}$

    = 1

15. (i) No. of bags in which more than 40 seeds germinated out of 50 seeds is 3

    ∴Required probability $P(E) = \frac{3}{5} = 0.6$

    (ii) No. of bags in which 49 seeds germinated = 0

    Required probability $P(E) = \frac{0}{5} = 0$

    (iii)No. of bags in which more than 35 seeds germinated = 5

    Required probability $P(E) = \frac{5}{5} = 1$