

CBSE TEST PAPER-01
CLASS - IX Mathematics (Probability)

General Instruction:1) All questions are compulsory.

2) Question No. 1 to 4 carry one mark each.

3) Question No. 5 to 8 carry two marks each.

4) Question No. 9 to 12 carry 3 marks each.

5) Question number 13 carry 5 marks.

1. Out of 35 students participating in a debate 10 are girls. The Probability that winner is a boy is :

(a) 1 (b) $\frac{2}{7}$ (c) $\frac{3}{7}$ (d) $\frac{5}{7}$

2. There are 5 balls, each of the colours white, blue, green, red and yellow in a bag. If 1 ball is drawn from the bag, then the Probability that the ball drawn is red is :

(a) $\frac{4}{5}$ (b) $\frac{1}{4}$ (c) $\frac{1}{5}$ (d) $\frac{1}{20}$

3. If $P(E) = 0.25$ what is the value of $P(\text{not } E)$:

(a) 0.5 (b) 1 (c) 0 (d) 0.75

4. Sum of the probabilities of all events of a trial is :

(a) less than 1 (b) greater than 1 (c) lies between 0 and 1 (d) 1

5. A die is thrown 1000 times with the frequencies for the outcomes 1, 2, 3, 4, 5 and 6 as given in the following table:

Outcome	1	2	3	4	5	6
Frequency	179	150	157	149	175	190

Find the probability of getting each outcome.

6. Two coins are tossed 729 times and the outcomes are:

No tail: 189, One tail: 297, Two tails: 243,

Find the Probability of the occurrence of each of these events.

7. A bag contains 15 cards bearing numbers 1, 2, 3, 4, , 14, 15. A card is drawn from the bag. Find the Probability that it bears :

(i) A prime number (ii) A number divisible by 2

8. A coin is tossed 400 times and outcomes are Tail: 230 Head: 170

Find the probability of having a (i) Head (ii) Tail

9. The marks obtained by 30 students is given in the following table:

Marks	52	58	60	65	68	70	75
No. of Students	7	5	4	6	3	3	2

Find the Probability that a student secures :

(i) 60 marks (ii) 75 marks (iii) Less than 60 marks

10. A tyre manufacturing company kept a record of the distance covered shows the results of 1000 tyres :

Distance(in km)	Less than 4000	4000 to 9000	9001 to 14000	More than 14000
Frequency	20	210	325	445

If you buy a tyre of this company. What is the Probability that :

(i) it will need to be replaced before it has covered 4000 km

(ii) it will last more than 9000 km

(iii) it will need to be replaced after it has covered somewhere between 4000 km and 14000 km

11. The ages of 30 workers in a factory are as follows :

Age (in yrs)	21-23	23-25	25-27	27-29	29-31	31-33	33-35

workers	3	4	5	6	5	4	3
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Find the probability that the age of a works lies in the interval :

- (i) 27-29 (ii) 29-35 (iii) 21-27

12. A die is thrown once. Find the probability of getting :

- (i) A prime number (ii) A number less than 5

13. An organization selected 2400 families at random and surveyed them to determine a relationship between income level and the number of vehicles in a family. The information gathered is listed in the table below :

Monthly income (in Rs)	Number of Vehicles per family			
	0	1	2	Above 2
Less than 7000	10	160	25	0
7000-10000	0	305	27	2
10000-13000	1	535	29	1
13000-16000	2	469	59	25
16000 or more	1	579	82	88

Suppose a family is chosen. Find the probability that the family chosen is :

- (i) earning Rs 10000 – 13000 Per month and owning exactly 2 vehicles.
(ii) earning Rs 16000 or more per month and owning exactly 1 vehicle.
(iii) Earning less than Rs 7000 Per month and not own any vehicle.
(iv) Earning Rs 13000-16000 per month and owning more than 2 vehicles.
(v) Owning not more than 1 vehicle.

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[ANSWERS]

Ans1. (D)

Ans2. (C)

Ans3. (D)

Ans4. (D)

Ans5. (i) Number of outcome getting number 1 = 179

$$P(1) = \frac{179}{1000} = 0.179$$

(ii) Number of outcome getting number 2 = 150

Probability of outcome 2

$$P(2) = \frac{150}{1000} = 0.15$$

(iii) Number of outcome getting number 3 = 157

Probability of outcome 3

$$P(3) = \frac{157}{1000} = 0.157$$

(iv) Number of outcome getting number 4 = 149

Probability of outcome 4

$$P(4) = \frac{149}{1000} = 0.149$$

(v) Number of outcome getting number 5 = 175

Probability of outcome 5

$$P(5) = \frac{175}{1000} = 0.175$$

(vi) Number of outcome getting number 6 = 190

Probability of outcome 6

$$P(6) = \frac{190}{1000} = 0.19$$

Ans6. Number of total trials = 729

E_1 , E_2 and E_3 are events getting no tail, one tail and two tails, respectively then

$$P(E_1) = \frac{189}{729} = \frac{7}{27}$$

$$P(E_2) = \frac{297}{729} = \frac{11}{27}$$

$$P(E_3) = \frac{243}{729} = \frac{1}{3}$$

Ans7. Total number of cards = 15

No. of total trials = 15

(i) Among 1, 2, 3, 4,....., 14,15, prime number are 2, 3, 5, 7, 11, 13

Number of favourable outcomes = 6

$$P(\text{Prime number}) = \frac{6}{15} = \frac{2}{5}$$

(ii) Among 1, 2, 3, 4,, 14, 15

Number divisible by 2 are 2, 4, 6, 8, 10, 12, 14

∴ Number of outcomes = 7

$$P(\text{number divisible by 2}) = \frac{7}{15}$$

Ans8. (i) Total outcomes = 400

Head = 170

$$P(H) = \frac{170}{400} = \frac{17}{40}$$

(ii) Tail = 230

$$P(T) = \frac{230}{400} = \frac{23}{40}$$

Ans9. Total number of students = 30

No. of students securing 60 marks = 4

$$(i) \therefore P(\text{Students securing 60 marks}) = \frac{4}{30} = \frac{2}{15}$$

(ii) Number of students securing 75 marks = 2

$$\therefore P(\text{Students securing 75 marks}) = \frac{2}{30} = \frac{1}{15}$$

(iii) Number of students securing less than 60 marks = 5+7 = 12

$$P(\text{Students securing less than 60 marks}) = \frac{12}{30} = \frac{2}{5}$$

Ans10.(i) Number of tyres which covered distance less than 4000 km = 20

Total number of tyres = 1000

$$\text{Required probability } P(E) = \frac{20}{1000} = \frac{1}{50}$$

(ii) Number of tyres needed to replaced more then 9000 km = 325+445=770

$$\text{Required Probability} = \frac{770}{1000} = \frac{77}{100} = 0.77$$

(iii) Number of tyres needed to replaced between 4000 km, to 14,000km.

$$= 210 + 325 + 445 = 980$$

$$\text{Required probability} = \frac{980}{1000} = 0.98$$

Ans11. (i)

The number of workers lies in the interval 27-29 are = 6

Total no. of workers = 30

$$\text{Required probability} = \frac{6}{30} = \frac{1}{5}$$

(ii)

Number of workers having age between 29 - 35 = 5+4+3 = 12

Total number of workers = 30

$$\text{Required Probability} = \frac{12}{30} = \frac{2}{5}$$

(iii)

Number of workers having age between 21 - 27 = 3+4+5=12

Total no. of workers = 30

$$\text{Required Probability} = \frac{12}{30} = \frac{2}{5}$$

Ans12. 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

$$\therefore \text{The probability of getting prime number} = \frac{3}{6} = \frac{1}{2}$$

(ii) Numbers less than 5 are 1, 2, 3, 4

∴ Frequency of happening of a number less than 5 is 4

$$\therefore \text{Probability of getting a number less than 5} = \frac{4}{6} = \frac{2}{3}$$

Ans13.(i) From the table number of families owning 2 vehicles and earning between Rs 10,000 – Rs 13,000 = 29

Total no. of families = 2400

$$\therefore \text{Required Probability} = \frac{29}{2400}$$

(ii) Number of families owning 1 vehicle and earning more than Rs 16000 is 579

$$\therefore \text{Required Probability} = \frac{579}{2400}$$

$$\text{(iii) } P(\text{earning} < \text{Rs } 7,000 \text{ and no vehicle}) = \frac{10}{2400} = \frac{1}{240}$$

$$\text{(iv) } P(\text{earning between Rs } 13,000 - \text{Rs } 16,000 \text{ and owning} > 2 \text{ vehicles}) = \frac{25}{2400} = \frac{1}{96}$$

$$\text{(v) Number of families with not more than 1 vehicle} = 10+160+0+305+1+535+2+469+1+579 = 2062$$

$$\therefore P(\text{Family with not more than 1 vehicle}) = \frac{2062}{2400} = \frac{1031}{1200}$$