CHAPTER TEST: PROBABILITY

Mathematics | Class IX | (2026/PROBAB/09/003)

Time: 1.5 Hours **Max. Marks: 40**

General Instructions:

- All questions are compulsory.

- Section A contains 8 MCQs of 1 mark each.

- Section B contains 4 questions of 2 marks each.

- Section C contains 3 questions of 3 marks each.

- Section D contains 2 questions of 5 marks each.

- Use of calculators is strictly prohibited.

Section A: Multiple Choice Questions (8 Marks)

1. A bag contains cards numbered from 1 to 25. A card is drawn at random. The probability that the number on the card is a multiple of 5 is:

   (a) $\frac{1}{5}$

   (b) $\frac{2}{5}$

   (c) $\frac{4}{25}$

   (d) $\frac{1}{25}$

2. In a survey of 300 ladies, it was found that 142 like coffee while 158 dislike it. The probability that a lady chosen at random dislikes coffee is:

   (a) 0.526

   (b) 0.473

   (c) 0.520

   (d) 0.426

3. If $P(A)$ denotes the probability of an event A, then:

   (a) $P(A) < 0$

   (b) $P(A) > 1$

   (c) $0 \le P(A) \le 1$

   (d) $-1 \le P(A) \le 1$

4. Two coins are tossed 200 times. If the outcome "No Head" occurs 56 times, the probability of getting at least one head is:

   (a) 0.28

   (b) 0.72

(c) 0.44

(d) 0.56

5. The probability of an impossible event is:

    (a) 1

    (b) 0

    (c) 0.5

    (d) Not defined

6. A month is selected at random in a year. The probability that it starts with the letter 'J' is:

    (a) $\frac{1}{12}$

    (b) $\frac{1}{4}$

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

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

7. The probability of drawing a red king from a well-shuffled deck of 52 cards is:

    (a) $\frac{1}{13}$

    (b) $\frac{1}{26}$

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

    (d) $\frac{1}{52}$

8. In a sample of 500 items, 15 were found defective. The probability of picking a non-defective item is:

    (a) 0.03

    (b) 0.97

    (c) 0.95

    (d) 0.30

Section B: Very Short Answer Questions (8 Marks)

1. A dice is rolled 250 times. The number '3' appears 40 times. Find the experimental probability of getting a '3'.

2. If the probability of winning a game is 0.62, what is the probability of losing it?

3. List the sample space for picking a day of the week that starts with the letter 'S'. What is its size?

4. A box contains 5 red, 8 white, and 4 green marbles. One marble is taken out. What is the probability that it is not green?

Section C: Short Answer Questions (9 Marks)

1. Over the past 100 days, the frequency of a baker selling out of bread is given below:

Outcome	Sold out before noon	Sold out 12-3 PM	Sold out after 3 PM	Not sold out
Frequency	15	35	40	10

Find the probability that on a given day: (i) Bread is sold out before 3 PM. (ii) Bread is not sold out.

2. A spinner is divided into 5 equal parts colored Red, Blue, Green, Yellow, and Orange. (i) If you spin it once, what is the probability of not landing on Green? (ii) If you spin it 100 times and land on Red 22 times, what is the experimental probability of landing on Red?
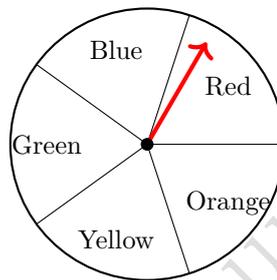

3. 1500 families with 2 children were selected randomly and the following data were recorded:

Number of girls in a family	2	1	0
Number of families	475	814	211

Compute the probability of a family, chosen at random, having: (i) 2 girls, (ii) at most 1 girl.

## Section D: Long Answer Questions (10 Marks)

1. A company manufactured 10,000 laptops in a month. 200 were found to have screen defects, 150 had battery issues, and 50 had both. A laptop is chosen at random.

   (a) What is the probability it has a screen defect only?

   (b) What is the probability it has a battery issue only?

   (c) What is the probability it has at least one of these two defects?

   (d) What is the probability it has no defects?

2. A square dartboard $ABCD$ has a side length of 20 cm. A smaller square $PQRS$ of side 10 cm is inscribed inside it such that its vertices are the midpoints of the sides of $ABCD$. A circular region is further inscribed inside $PQRS$ with a radius of 5 cm. If a dart hits the square $ABCD$ at random, find the probability that: (i) It hits the shaded circular region. (ii) It hits the region between the circle and square $PQRS$. (Use $\pi = 3.14$)

20 cm
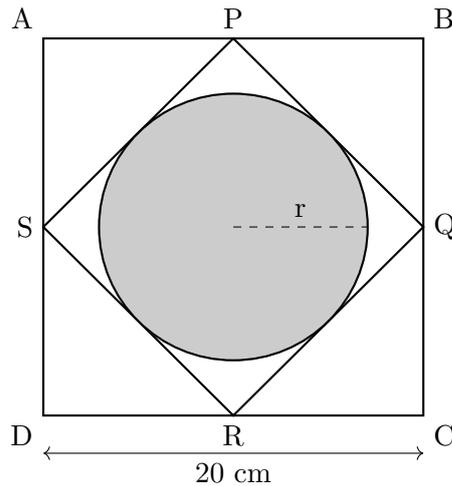
Section E

Case Study:

During a summer selection camp at the National Cricket Academy, a head coach monitored the performance of a promising young batsman over exactly six hundred deliveries. Historically, probability in sports was used for simple win-loss records, but modern scope includes detailed stroke analysis. In this experimental trial, the coach recorded that the batsman scored runs from three hundred sixty deliveries. Furthermore, the data showed that on ninety deliveries, the batsman was beaten by the pace but did not lose his wicket. The remaining deliveries resulted in the batsman losing his wicket to the bowlers. By documenting these specific frequencies, the coaching staff can determine the empirical probability of the player's scoring consistency. This mathematical approach allows the team to make data-driven decisions about player selection based on observed performance rather than subjective intuition alone.
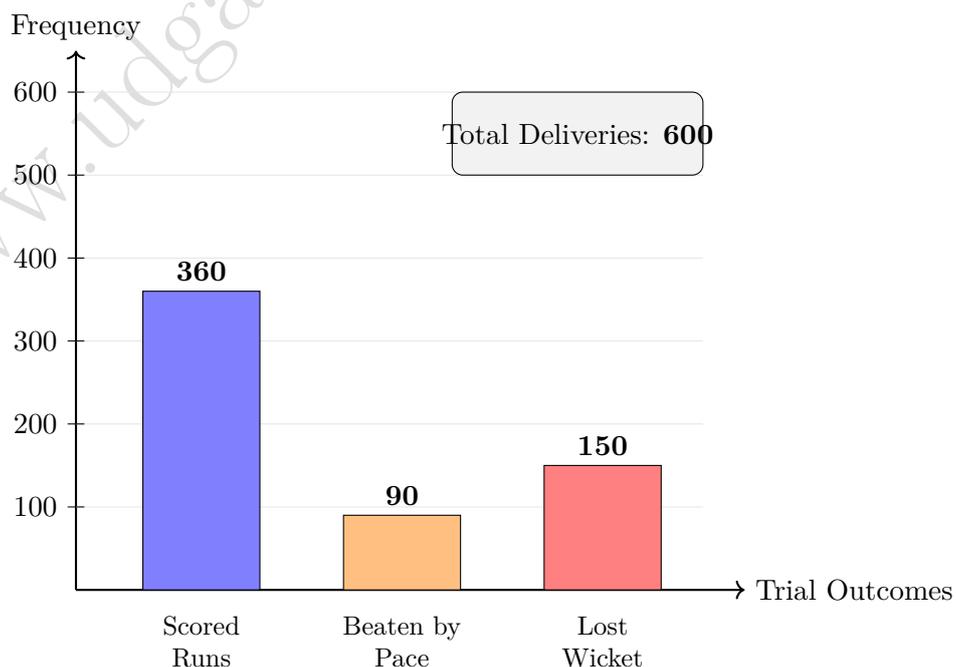
Multiple Choice Questions

1. Based on the coach's trial, what is the empirical probability that the batsman scores runs on the next delivery?

   (a) 0.36
   (b) 0.60
   (c) 0.90
   (d) 0.75

2. How many deliveries in this experiment resulted in the batsman "losing his wicket"?

   (a) 90
   (b) 150
   (c) 240
   (d) 60

3. What is the probability that a delivery chosen at random from this set did NOT result in the batsman being "Beaten by Pace"?

   (a) 17/20
   (b) 3/20
   (c) 9/60
   (d) 1/6

4. If the coach defines a "Successful Delivery" as one where the batsman either scores runs or is beaten without losing his wicket, what is $P(\text{Success})$?

   (a) 0.45
   (b) 0.50
   (c) 0.75
   (d) 0.85

5. In a future match where the batsman faces 120 balls, how many times is he expected to lose his wicket based on this experimental data?

   (a) 15
   (b) 45
   (c) 30
   (d) 25