

CLASS 10 — MATHEMATICS

Chapter: Probability

Practice Worksheet | CBSE Pattern

Maximum Marks: 40

Time Allowed: 1 hour 30 minutes

Name: _____

Class/Section: _____ Date: _____

General Instructions:

1. All questions are compulsory.
2. Read each question carefully before answering.
3. Show complete working for questions requiring calculations or proofs.
4. Select only one option for each MCQ.
5. Marks for each question are indicated alongside the question.
6. Write mathematical steps clearly and use appropriate notation.

This paper has 21 questions in five sections: A (Q1–Q10, 1 mark each), B (Q11–Q15, 2 marks each), C (Q16–Q19, 3 marks each), D (Q20, 4 marks) and E (Q21, case study, 4 marks). A deck of playing cards has 52 cards in 4 suits of 13 cards each; the face cards are the kings, queens and jacks. Give each probability in its simplest form.

SECTION A

Multiple Choice Questions — Q1 to Q10 carry 1 mark each.

- Q1.** Which of the following cannot be the probability of an event? **[1 mark]**
(A) 0.7 (B) $\frac{2}{3}$ (C) 1.2 (D) 0
- Q2.** If $P(E) = 0.36$, then $P(\text{not } E)$ is **[1 mark]**
(A) 0.36 (B) 0.64 (C) 1.36 (D) 0.46
- Q3.** A die is thrown once. The probability of getting a prime number is **[1 mark]**
(A) $\frac{1}{3}$ (B) $\frac{2}{3}$ (C) $\frac{1}{6}$ (D) $\frac{1}{2}$
- Q4.** A card is drawn at random from a well-shuffled deck of 52 playing cards. The probability that it is a red king is **[1 mark]**
(A) $\frac{1}{13}$ (B) $\frac{1}{26}$ (C) $\frac{1}{52}$ (D) $\frac{2}{13}$
- Q5.** Two coins are tossed together. The probability of getting at least one head is **[1 mark]**
(A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) $\frac{3}{4}$ (D) 1
- Q6.** A letter is chosen at random from the letters of the word PROBABILITY. The probability that it is a vowel is **[1 mark]**
(A) $\frac{4}{11}$ (B) $\frac{3}{11}$ (C) $\frac{5}{11}$ (D) $\frac{4}{7}$

- Q7.** Two dice are thrown together. The probability that the sum of the numbers on the two dice is 7 is **[1 mark]**
(A) $\frac{1}{12}$ (B) $\frac{7}{36}$ (C) $\frac{1}{6}$ (D) $\frac{5}{36}$

- Q8.** A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is twice that of drawing a red ball, the number of blue balls is **[1 mark]**
(A) 10 (B) 5 (C) 15 (D) 2.5

In Q9 and Q10, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

- Q9. Assertion (A):** The probability of getting a number greater than 6 when a die is thrown once is 0. **[1 mark]**
Reason (R): The probability of an impossible event is 0.
(A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

- Q10. Assertion (A):** When two coins are tossed together, the outcomes are two heads, one head and one tail, and two tails, so $P(\text{two heads}) = \frac{1}{3}$. **[1 mark]**
Reason (R): When two coins are tossed, HT and TH are different outcomes, so there are 4 equally likely outcomes.
(A) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

SECTION B

Very Short Answer Questions — Q11 to Q15 carry 2 marks each.

Q11. A bag contains 4 red, 6 white and 5 green balls. One ball is drawn at random. Find the probability that the ball is (i) white, (ii) not green. **[2 marks]**

Q12. A box contains 50 discs numbered 1 to 50. One disc is drawn at random. Find the probability that the number on it is (i) a perfect square, (ii) a multiple of 6. **[2 marks]**

Q13. One card is drawn at random from a well-shuffled deck of 52 cards. Find the probability of getting (i) a face card, (ii) neither a king nor a heart. **[2 marks]**

Q14. A lot of 200 bulbs contains 16 defective bulbs. One bulb is drawn at random. (i) Find the probability that it is good. (ii) The bulb drawn is found to be defective and is not replaced. Another bulb is then drawn at random from the rest. Find the probability that this bulb is good. **[2 marks]**

Q15. A die is thrown twice. Find the probability that (i) the same number appears on both throws, (ii) the sum of the two numbers is at least 11. **[2 marks]**

SECTION C

Short Answer Questions — Q16 to Q19 carry 3 marks each.

- Q16.** Three coins are tossed together. Write all the possible outcomes, **[3 marks]**
and find the probability of getting (i) exactly two heads, (ii) at least two heads, (iii) no head.

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- Q17.** Two dice are thrown at the same time. Find the probability that (i) **[3 marks]**
the product of the numbers is 6, (ii) the sum of the numbers is a prime number, (iii) the numbers on the two dice differ by 2.

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- Q18.** A box contains 24 marbles, which are red, green or blue. The **[3 marks]**
probability of drawing a red marble is $\frac{1}{4}$ and that of drawing a green marble is $\frac{1}{3}$. Find the number of blue marbles in the box. If 4 more blue marbles are added, what is the probability of drawing a blue marble?

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- Q19.** All the aces and all the jacks are removed from a deck of 52 playing **[3 marks]**
cards. One card is then drawn at random from the remaining cards. Find the probability that the card is (i) a red card, (ii) a face card, (iii) the 10 of hearts.
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SECTION D

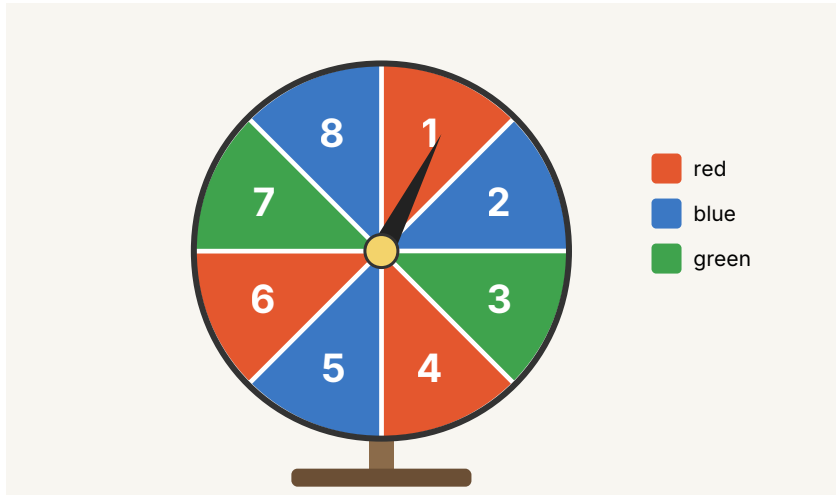
Long Answer Question — Q20 carries 4 marks.

- Q20.** A box contains 100 cards numbered 2, 3, 4, ..., 101. One card is drawn at random. Find the probability that the number on the card is: **[4 marks]**
- (i) an even number, (ii) a perfect square, (iii) a prime number less than 20, (iv) divisible by both 3 and 5.

SECTION E

Case Study Based Question — Q21 carries 4 marks.

- Q21.** At a school fair, a game uses the spinning wheel shown below. The wheel is divided into 8 equal sectors numbered 1 to 8 and coloured red, blue or green. The arrow is equally likely to stop on any sector. (If the arrow stops on a line, the wheel is spun again.) **[4 marks]**



Based on the above information, answer the following questions:

- (i) Find the probability that the arrow stops on a green sector. **[1 mark]**
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- (ii) Find the probability that the arrow stops on an odd number. **[1 mark]**
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- (iii) Find the probability that the arrow stops on (a) a prime number, (b) a red sector with an even number. **[2 marks]**
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