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Probability — CBSE Class 10 Mathematics Chapter Test

FREE CHAPTER TEST · CLASS X · MATHEMATICS (041) · PATTERN OF THE CBSE SAMPLE QUESTION PAPER 2026-27

TIME ALLOWED	MAXIMUM MARKS	QUESTIONS	NAME / ROLL NO.
1½ hours	40	19 (A 10 · B 3 · C 2 · D 2 · E 2)	

GENERAL INSTRUCTIONS

Read the following instructions very carefully and strictly follow them:

1. This question paper contains 19 questions. All questions are compulsory.
2. This question paper is divided into five sections: A, B, C, D and E.
3. In Section A, Questions 1 to 8 are multiple choice questions (MCQs) and Questions 9 and 10 are assertion-reason based questions of 1 mark each.
4. In Section B, Q11–13 are very short answer (VSA) type questions, carrying 2 marks each.
5. In Section C, Q14–15 are short answer (SA) type questions, carrying 3 marks each.
6. In Section D, Q16–17 are long answer (LA) type questions, carrying 5 marks each.
7. In Section E, Q18–19 are case study based questions, carrying 4 marks each, with sub-parts of the values of 1, 1 and 2 marks.
8. There is no overall choice. However, an internal choice has been provided in 1 question of Section B, 1 question of Section C, 1 question of Section D and in the 2-mark sub-part of each question of Section E.
9. Use of calculators is not allowed.
10. This chapter test follows the section structure, question types and marks per question of the CBSE Class X Mathematics (Standard, 041) Sample Question Paper 2026-27, at half the length of the 80-mark board paper: 40 marks in 1½ hours.
11. The answer key and the marking scheme are at the end of this booklet. Attempt the paper in 1½ hours before you look at them.

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Chapter: Probability · **Topics:** Classical probability · Dice and coins · Playing cards · Complementary events · Numbered cards and discs

SECTION A

This section comprises 10 questions of 1 mark each: 8 multiple choice questions (MCQs) and 2 assertion-reason based questions.

1. A die is thrown once. The probability of getting a prime number is 1

(A) $\frac{1}{2}$ (B) $\frac{1}{3}$

(C) $\frac{2}{3}$ (D) $\frac{1}{6}$

2. If P(E) = 0.08, then P(not E) is 1

(A) 0.08 (B) 0.92

(C) 0.8 (D) 1.08

3. A card is drawn from a well-shuffled pack of 52 cards. The probability that it is a king is 1

(A) $\frac{1}{52}$ (B) $\frac{1}{4}$

(C) $\frac{1}{13}$ (D) $\frac{4}{13}$

4. Which of the following cannot be the probability of an event? 1

(A) 0 (B) 0.7

(C) 1 (D) 1.5

5. Two coins are tossed together. The probability of getting at least one head is 1

(A) $\frac{1}{4}$ (B) $\frac{3}{4}$

(C) $\frac{1}{2}$ (D) 1

6. Two dice are thrown together. The probability that the sum is 7 is 1

(A) $\frac{1}{36}$ (B) $\frac{5}{36}$

(C) $\frac{1}{6}$ (D) $\frac{7}{36}$

7. A bag contains 3 red and 5 black balls. One ball is drawn at random. The probability that it is red is 1

(A) $\frac{3}{8}$ (B) $\frac{5}{8}$

(C) $\frac{3}{5}$ (D) $\frac{1}{8}$

8. The probability of a sure event is 1

(A) 0 (B) $\frac{1}{2}$

(C) -1 (D) 1

9. **Assertion (A):** The probability of getting 7 when a single die is thrown is 0. 1

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.

10. **Assertion (A):** When two coins are tossed, the probability of getting two heads is $\frac{1}{3}$. 1

Reason (R): When two coins are tossed, the outcomes HH, HT, TH and TT are equally likely.

(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

This section comprises 3 very short answer (VSA) type questions of 2 marks each.

11. (a) A die is thrown once. Find the probability of getting (i) a number less than 3, (ii) a number not less than 3. 2

OR

(b) A letter is chosen at random from the letters of the word MATHEMATICS. Find the probability that it is a vowel.

12. A box contains 75 discs numbered 1 to 75. One disc is drawn at random. Find the probability that it bears (i) a two-digit number, (ii) a perfect square. 2

13. Find the probability that a year that is not a leap year, selected at random, has 53 Mondays. 2

SECTION C

This section comprises 2 short answer (SA) type questions of 3 marks each.

14. (a) Two dice are thrown together. Find the probability of getting (i) a sum of 8, (ii) a doublet, (iii) a sum less than 4. 3

OR

(b) The 2, 3, 4, 5 and 6 of hearts are shuffled with their faces down. (i) One card is picked; find the probability that it is the 4. (ii) If the 4 is picked and put aside, find the probability that a second card picked is the 6, and that it is the 4.

15. A bag contains 6 blue, 7 yellow and 3 white balls. One ball is taken out at random. Find the probability that it is (i) blue, (ii) yellow, (iii) not white. 3

SECTION D

This section comprises 2 long answer (LA) type questions of 5 marks each.

16. (a) Two dice are thrown together. Find the probability that (i) the product of the numbers is 6, (ii) the difference of the numbers is 2, (iii) the sum of the numbers is a prime number. 5

OR

(b) One card is drawn from a well-shuffled pack of 52 cards. Find the probability of getting (i) a black queen, (ii) a red face card, (iii) a heart, (iv) the jack of clubs, (v) neither a black card nor a king.

17. (i) Of 200 bulbs in a carton, 180 are good, 14 have minor defects and 6 have major defects. Ravi, a shopkeeper, accepts only good bulbs; Neha, another shopkeeper, rejects only bulbs with major defects. A bulb is drawn at random. Find the probability that it is acceptable to Ravi, and to Neha. (ii) A jar has 30 marbles, some green and the rest blue. The probability of drawing a green marble is 3/5. Find the number of blue marbles. 5

SECTION E

This section comprises 2 case study based questions of 4 marks each, with sub-parts of 1, 1 and 2 marks.

18. In a board game, two friends, Asha and Ben, each throw a die once.

(i) How many outcomes are possible? [1]

(ii) Find the probability that both get the same number. [1]

(iii) Find the probability that they get different numbers. [2]

OR

(iii) Find the probability that the sum of their numbers is 10. [2]

19. For a classroom quiz, 30 cards numbered 1 to 30 are put in a box, and a student draws one card at random.

(i) Find the probability that the number is a multiple of 5. [1]

(ii) Find the probability that the number is a prime number. [1]

(iii) Find the probability that the number is a perfect square. [2]

OR

(iii) Find the probability that the number is divisible by 3 or by 5. [2]

END OF THE QUESTION PAPER

ANSWER KEY — SECTION A

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
(A)	(B)	(C)	(D)	(B)	(C)	(A)	(D)	(A)	(D)

MARKING SCHEME AND WORKED SOLUTIONS

Marks for each step are shown in brackets, as in the CBSE marking scheme. Any correct alternative method earns full marks.

Q1. Answer (A). 2, 3, 5: 3 of 6 outcomes.

Q2. Answer (B). 1 − 0.08 = 0.92.

Q3. Answer (C). 4/52.

Q4. Answer (D). A probability lies between 0 and 1.

Q5. Answer (B). HH, HT, TH: 3 of 4.

Q6. Answer (C). 6 of 36 outcomes.

Q7. Answer (A). 3/8.

Q8. Answer (D). A sure event has probability 1.

Q9. Answer (A). Getting 7 on one die is impossible. Answer (A).

Q10. Answer (D). With four equally likely outcomes, P(HH) = 1/4: A is false, R is true. Answer (D).

Q11. (2 marks) Answer: (a) 1/3, 2/3; (b) 4/11.
(a) (i) 1, 2: 2/6 = 1/3. [1] (ii) 1 − 1/3 = 2/3. [1]
OR (b) MATHEMATICS has 11 letters, of which A, E, A, I are vowels. [1] P(vowel) = 4/11. [1]

Q12. (2 marks) Answer: 22/25, 8/75.
(i) 10 to 75: 66 discs; 66/75 = 22/25. [1] (ii) 1, 4, 9, …, 64: 8 discs; 8/75. [1]

Q13. (2 marks) Answer: 1/7.
A non-leap year has 365 days = 52 weeks and 1 day. [1] The extra day can be any of the 7 days of the week, equally likely; it gives 53 Mondays only if it is a Monday. P = 1/7. [1]

Q14. (3 marks) Answer: (a) 5/36, 1/6, 1/12; (b) 1/5; 1/4 and 0.
(a) 36 outcomes. (i) (2,6), (3,5), (4,4), (5,3), (6,2): 5/36. [1] (ii) 6 doublets: 1/6. [1] (iii) (1,1), (1,2), (2,1): 3/36 = 1/12. [1]
OR (b) (i) 1/5. [1] (ii) With the 4 put aside, 4 cards remain: P(6) = 1/4 [1], P(4) = 0. [1]

Q15. (3 marks) Answer: 3/8, 7/16, 13/16.
Total 16. [½] (i) 6/16 = 3/8. [1] (ii) 7/16. [½] (iii) 13/16. [1]

Q16. (5 marks) Answer: (a) 1/9, 2/9, 5/12; (b) 1/26, 3/26, 1/4, 1/52, 6/13.
(a) 36 outcomes. [½] (i) (1,6), (6,1), (2,3), (3,2): 4/36 = 1/9. [1½] (ii) (1,3), (3,1), (2,4), (4,2), (3,5), (5,3), (4,6), (6,4): 8/36 = 2/9. [1½] (iii) Sums 2, 3, 5, 7, 11 occur 1 + 2 + 4 + 6 + 2 = 15 times: 15/36 = 5/12. [1½]
OR (b) (i) 2/52 = 1/26. [1] (ii) 6 red face cards: 6/52 = 3/26. [1] (iii) 13/52 = 1/4. [1] (iv) 1/52. [1] (v) Black cards and kings: 26 + 2 = 28; neither: 24/52 = 6/13. [1]

Q17. (5 marks) Answer: (i) 9/10, 97/100; (ii) 12.
(i) Ravi: 180/200 = 9/10. [1] Neha: (180 + 14)/200 = 97/100. [1½]
(ii) Green = 3/5 × 30 = 18 [1½]; blue = 30 − 18 = 12. [1]

Q18. (4 marks) Answer: (i) 36; (ii) 1/6; (iii) 5/6, or 1/12.
(i) 6 × 6 = 36. [1]
(ii) 6/36 = 1/6. [1]
(iii)(a) 1 − 1/6 [1] = 5/6. [1]
OR (iii)(b) (4,6), (5,5), (6,4) [1]: 3/36 = 1/12. [1]

Q19. (4 marks) Answer: (i) 1/5; (ii) 1/3; (iii) 1/6, or 7/15.
(i) 5, 10, …, 30: 6/30 = 1/5. [1]
(ii) 2, 3, 5, 7, 11, 13, 17, 19, 23, 29: 10/30 = 1/3. [1]
(iii)(a) 1, 4, 9, 16, 25 [1]: 5/30 = 1/6. [1]
OR (iii)(b) 10 multiples of 3 + 6 multiples of 5 − 2 multiples of 15 = 14 [1]: 14/30 = 7/15. [1]

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