Mathematics — Ganita Manjari

Chapter 7 Test 4

The Mathematics of Maybe: Introduction to Probability

Class IX | 2026–27

Time Allowed: 45 Minutes | Maximum Marks: 25

General Instructions

1. All 13 questions are compulsory. Choose one option in A; show working in B–D.
2. No calculators. Give exact answers unless an approximation is requested.
3. Use the stated fairness and replacement conditions in each question.

SECTION A

(5 questions × 1 mark = 5 marks)

1. On a die roll, which description is a single outcome?

(A) An even number
(B) A number greater than 2
(C) A prime number
(D) The number 4

2. The relative frequencies of three exhaustive outcomes are shown. What is the missing value?

Outcome	A	B	C
Relative frequency	0.45	0.30	?

(A) 0.15
(B) 0.25
(C) 0.35
(D) 0.75

3. The formula "favourable outcomes ÷ total outcomes" applies directly when the counted outcomes are:

(A) All different colours
(B) Equally likely
(C) Always two in number
(D) Observed at least once

4. Which set correctly records the distinct colours in a box containing red, red, blue and green balls?

(A) $\{R, B, G, Y\}$
(B) $\{R, B\}$
(C) $\{R, B, G\}$
(D) $\{4\}$

5. If an event is less likely than its non-occurrence but is possible, its probability p satisfies:

(A) $0 < p < \frac{1}{2}$
(B) $p = 0$
(C) $\frac{1}{2} < p < 1$
(D) $p = 1$

SECTION B

(4 questions × 2 marks = 8 marks)

6. A card numbered from 1 to 20 is chosen uniformly. List the perfect squares and find the probability of drawing one.

7. A spinner lands on red 8 times in 20 spins. How many red results are needed in the next 30 spins for the overall experimental probability to be 1/2?

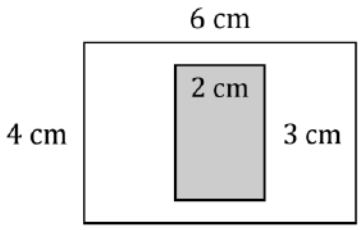
8. A coin gives 7 heads in 10 tosses. Does this prove that the coin is unfair? Explain, and suggest a useful next step.

9. For two standard dice, give one impossible event and one certain event involving their sum. State their probabilities.

SECTION C

(3 questions × 3 marks = 9 marks)

10. A point is chosen uniformly from the 6 cm by 4 cm rectangle. Find the probability that it lies in the shaded 2 cm by 3 cm rectangle, and the probability that it lies outside it.



11. Three fair coins are tossed independently in order. Find the probability that the first is heads and exactly two heads occur altogether. List the favourable outcomes.

12. A box contains 4 numbered balls. Two are drawn uniformly in order. Find the number of ordered outcomes with replacement and without replacement, and explain the difference.

SECTION D

(1 application question × 3 marks = 3 marks)

13. In a random sample of 250 bulbs, 5 are defective. Estimate the defective count in a batch of 6000. Can the seller promise that exactly this many are defective? Give a reason.