

Probability — CBSE Pattern Test 2

Class 11 Maths · 90 minutes · 40 marks · Sections A–D with answer key · Narayan Gurukul Academy

Test 2 — CBSE Pattern (90 minutes, 40 marks)

Class 11 Maths · Probability · Narayan Gurukul Academy (ClassApna)

General Instructions: (1) This paper has four sections — Section A (1×10), Section B (2×4), Section C (3×4) and Section D (5×2) — total 40 marks. Time allowed: 90 minutes.
(2) All questions are compulsory. No overall choice is given; internal choice, where allowed, is clearly marked.
(3) For MCQ questions choose the single correct option; for VSA answers write a single line.
(4) Take $g = 10 \text{ m/s}^2$. All symbols carry their usual meaning. Use of a calculator is not permitted.

Section A — MCQ & VSA ($10 \times 1 = 10$ marks)

1. An outcome is
 - (A) a possible result of a random experiment
 - (B) the sample space
 - (C) an event with probability 1
 - (D) always impossible
2. An event is a
 - (A) subset of the sample space
 - (B) the whole sample space only
 - (C) an outcome
 - (D) a random experiment
3. An event consisting of a single outcome is called
 - (A) an elementary event
 - (B) a compound event
 - (C) a sure event
 - (D) an impossible event
4. An impossible event has probability
 - (A) 0
 - (B) 1
 - (C) $1/2$
 - (D) ∞
5. If A and B are mutually exclusive, then $P(A \cap B) =$
 - (A) $P(A) + P(B)$
 - (B) $P(A)P(B)$
 - (C) $P(A) - P(B)$
 - (D) $P(A)/P(B)$
6. The event 'not A' is called the
 - (A) complement of A
 - (B) union of A
 - (C) intersection of A
 - (D) sample space
7. For mutually exclusive events, $P(A \cap B)$ equals
 - (A) 0

- (B) 1
 (C) $P(A)P(B)$
 (D) $P(A) + P(B)$
8. If $P(A) = 1/4$, the odds against A are
 (A) 3 : 1
 (B) 1 : 3
 (C) 1 : 4
 (D) 4 : 1
9. Define an outcome.
 10. Define a compound event.

Section B — Short Answer I ($4 \times 2 = 8$ marks)

11. Write the sample space when a die is rolled once.
 12. What is an elementary event?
 13. What is $P(S)$ for the sample space S?
 14. Define mutually exclusive events.

Section C — Short Answer II ($4 \times 3 = 12$ marks)

15. Write the sample space for tossing a coin and rolling a die together.
 16. If $P(A \cap B) = 0.7$, $P(A) = 0.4$ and $P(B) = 0.5$, find $P(A \cap B)$.
 17. If $P(A) = 0.35$, find $P(\text{not } A)$.
 18. The odds in favour of an event are 2 : 3. Find the probability of the event.

Section D — Long Answers ($2 \times 5 = 10$ marks)

19. Two dice are rolled. Write the sample space and find the probability that the sum is 7 or that the sum is 6 or 8 (treating as mutually exclusive events).
 20. Prove that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ using the axioms of probability. If the odds in favour of an event are 7 : 5, find the probability of the event and of its complement.

Answer Key (Marking Scheme)

- Q1 — (A) a possible result of a random experiment. Q2 — (A) subset of the sample space. Q3 — (A) an elementary event. Q4 — (A) 0.
 Q5 — (A) $P(A) + P(B)$. Q6 — (A) complement of A. Q7 — (A) 0. Q8 — (A) 3 : 1.
 Q9 — A possible result of a random experiment.
 Q10 — An event with more than one outcome.
 Q11 — {1, 2, 3, 4, 5, 6}.
 Q12 — An event with a single outcome.
 Q13 — 1.
 Q14 — Events with no common outcome ($A \cap B = \emptyset$).
 Q15 — {H1, H2, H3, H4, H5, H6, T1, T2, T3, T4, T5, T6}.
 Q16 — 0.2.

Q17 — 0.65.

Q18 — $\frac{2}{5}$.

Q19 — Sum 7: $\frac{6}{36}$; sum 6 or 8: $\frac{10}{36} = \frac{5}{18}$.

Q20 — Proof via axioms; $P = \frac{7}{12}$, complement $\frac{5}{12}$.