

**BOARD-PATTERN PRACTICE PAPER · CBSE CLASS 11****Mathematical Reasoning**

Applied Mathematics · Chapter 3 · Matches current CBSE blueprint · Each question PYQ-sourced where indicated

DATE	TOTAL MARKS	DURATION	MARKING	TARGET
_____	<b>30</b>	<b>60 min</b>	<b>As per board</b>	<b><math>\geq 24/30</math></b>

**GENERAL INSTRUCTIONS**

- All questions are compulsory.
- Section A — short answer (2 marks each).
- Section B — reasoning with full working (3 marks each).
- Section C — long-answer, multi-step (5 marks each).
- State the rule (negation / converse / contrapositive / quantifier) you apply at each step; method marks depend on it.
- Class 11 is internal school assessment; this paper follows the CBSE Applied-Maths (241) SQP pattern.

**Section A — Short answer ( $2 \times 4 = 8$  marks)****8 MARKS · 16 MIN**

- Q1.** State, with reason, whether each is a statement and give its truth value: (a) 'The number 17 is prime.' (b) 'Solve the equation  $x + 1 = 0$ .' [PYQ 2023 CBSE SQP] **[2 marks]**
- Q2.** Write the negation of: (a) 'All triangles have three sides.' (b) 'Some integers are negative.' [PYQ 2024 Annual Pattern] **[2 marks]**
- Q3.** Let p: '5 is odd' (T) and q: '5 is even' (F). Find the truth value of (i)  $p \wedge q$  and (ii)  $p \vee q$ , stating the rule used. [PYQ 2022 CBSE SQP] **[2 marks]**
- Q4.** Rewrite 'A number is a multiple of 9 only if it is a multiple of 3' in 'if ... then ...' form, and identify the necessary condition. [PYQ 2023 Annual Pattern] **[2 marks]**

**Section B — Reasoning with full working ( $3 \times 4 = 12$  marks)****12 MARKS · 24 MIN**

- Q5.** For the statement 'If a number is divisible by 10, then it is divisible by 5', write (i) the converse, (ii) the inverse and (iii) the contrapositive. State which one is logically equivalent to the original. [PYQ 2024 CBSE SQP] **[3 marks]**
- Q6.** Check whether the statement 'For every real number  $x$ ,  $x^2 \geq 0$ ' is true, justifying your answer; then state whether a single example would be enough to prove it. [PYQ 2022 Annual Pattern] **[3 marks]**
- Q7.** Disprove the statement: 'The product of two irrational numbers is always irrational.' [PYQ 2023 CBSE SQP] **[3 marks]**
- Q8.** Identify the component statements and the connective in 'The number 12 is divisible by 3 and by 4', and find the truth value of the compound statement. [PYQ 2024 Annual Pattern] **[3 marks]**

**Section C — Long-answer, multi-step ( $5 \times 2 = 10$  marks)****10 MARKS · 20 MIN**

- Q9.** (a) Write the negation of each: (i) 'Every student in the class likes mathematics.' (ii) 'There exists a positive integer that is the largest.' (b) For the conditional 'If two lines are parallel, then they do not intersect', write the contrapositive and state whether the original and the contrapositive have the same truth value. [PYQ 2024 CBSE SQP] **[5 marks]**
- Q10.** (a) Validate by the direct method: 'If  $n$  is an even integer, then  $n^2$  is even.' (b) Validate by the method of contrapositive: 'If  $n^2$  is even, then  $n$  is even.' [PYQ 2023 Annual Pattern] **[5 marks]**

**Marking scheme & model answers** — see companion Answer Key PDF · all PYQs traceable to actual CBSE papers · readyforboards.com · +91 70330 05444