Mathematics — Ganita Manjari

Chapter 9 Test 4

Propositions and their Converses

Class IX | 2026–27

Time Allowed: 45 Minutes | Maximum Marks: 25

General Instructions

1. All 13 questions are compulsory. The paper has four sections: A, B, C and D.
2. Section A: 5 × 1 = 5 marks; Section B: 4 × 2 = 8 marks; Section C: 3 × 3 = 9 marks; Section D: 1 × 3 = 3 marks.
3. Select one correct option in Section A. Give reasons or counterexamples wherever asked.
4. Use of calculators is not allowed. Figures are not necessarily drawn to scale.

SECTION A

(5 questions × 1 mark = 5 marks)

1. For positive integers m, n, which statement has the same meaning as 'm is a factor of n'?

(A) m is a multiple of n.
(B) n is a multiple of m.
(C) $m = n$.
(D) $m + n$ is prime.

2. A claim is stated for every positive integer n. Which value is admissible when searching for a counterexample?

(A) -4
(B) 0
(C) 1.5
(D) 12

3. If a positive integer n leaves remainder 2 when divided by 5, which form must it have for a nonnegative integer k?

(A) $n = 2k + 5$
(B) $n = 5k$
(C) $n = 5k + 2$
(D) $n = 5k - 2$

4. Which condition guarantees that a positive integer is divisible by 10?

(A) Its last digit is 0.
(B) Its digit sum is 10.
(C) Its last digit is 5.
(D) It is even.

5. Which value disproves 'If a nonzero integer is divisible by itself, then it is positive'?

(A) 1
(B) 7
(C) -3
(D) 12

SECTION B

(4 questions × 2 marks = 8 marks)

6. For a positive integer n: 'If n is divisible by 24, then it is divisible by both 4 and 6.' Write the converse and decide its truth.

7. A program labels an integer 'divisible by 8' whenever it is divisible by both 2 and 4. Give a misclassified positive integer and explain why the rule fails.

8. Express both directions of the divisibility-by- 3 digit-sum rule as if–then statements. Use the rule to decide whether 381 is divisible by 3.

9. If a positive integer d divides positive integers a and b, then it divides $a + b$. Write the converse and disprove it.

SECTION C

(3 questions × 3 marks = 9 marks)

10. For positive integers a, b, prove: 'If a divides b and b divides a, then $a = b$.' Write the converse and explain why it is true.

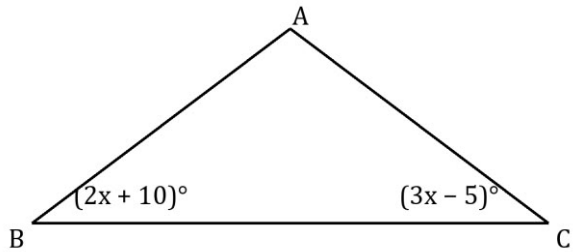
11. For positive integers a, b, c, prove: 'If a divides b and b divides c, then a divides c.' Write the converse and test it with a counterexample.

12. For a positive integer n, prove both directions of: 'n divides $n + 6$ if and only if n divides 6.' Hence list every possible value of n.

SECTION D

(1 application question × 3 marks = 3 marks)

13. In $\triangle\ ABC$ in figure, $AB = AC$. The marked expressions are the base angles.



(i) Find x and each base angle.
(ii) Find $\angle A$.
(iii) State the converse of the equal-sides property used.