Mathematics — Ganita Manjari

Chapter 9 Test 5

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. An integer's factor-partner table contains (4,9). Which pair cannot appear in the same table?
(A) (2,18) (B) (3,12)
(C) (5,7) (D) (6,6)

2. Which number disproves the claim: Every composite number has a prime factor greater than 2?
(A) 8 (B) 12
(C) 15 (D) 21

3. Which statement about the positive integer 1 is correct?
(A) It has no positive factors.
(B) It has two distinct positive factors.
(C) Its only factor is its own partner.
(D) It is a prime number.

4. A positive integer has exactly two distinct positive factors. What must be true?
(A) It is even.
(B) It is greater than 10.
(C) It is composite.
(D) It is prime.

5. How many unordered factor-partner pairs of 72 have both entries greater than 5?
(A) 1 (B) 2
(C) 3 (D) 4

SECTION B

(4 questions × 2 marks = 8 marks)

6. Write the converse and state both truth values. For positive integers a, b, n: If a is the partner of b in a factor pair of n, then b is the partner of a.

7. Write the converse and state both truth values. For an integer $n > 1$: If n has a positive factor other than 1 and itself, then n is composite.

8. Write the converse and state both truth values. For a positive integer n: If n is a factor of 18, then $n \leq 18$.

9. Write the converse and state both truth values. For an integer $n > 1$: If n is a perfect square, then n is composite.

SECTION C

(3 questions × 3 marks = 9 marks)

10. Let d be the smallest positive factor greater than 1 of a composite number n. Prove that d must be prime. Illustrate the result by finding d when $n = 143$.

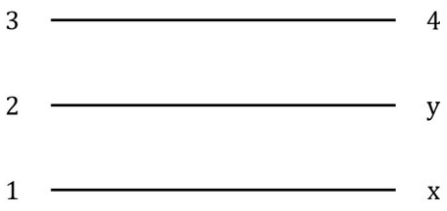
11. Prove that two distinct prime numbers have no common positive factor other than 1. Is the word "distinct" necessary? Justify your answer with an example.

12. For positive integers n, consider: "If n is a perfect square, then $2n$ is a perfect square." Write its converse. Disprove both statements using separate counterexamples.

SECTION D

(1 application question × 3 marks = 3 marks)

13. For a positive integer n, each segment in figure joins a factor to its partner.



(i) Find n, x and y.
(ii) Verify whether all the positive factors of n are shown.
(iii) Is n prime or composite? Give a reason.