Mathematics — Ganita Manjari

Chapter 9 Test 9

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. The marks allocation is shown at the start of each section.
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. Seven visitors receive coupons. Five wear blue caps, and every blue-cap wearer receives a coupon. How many coupon recipients do not wear blue caps?

(A) 2 (B) 5
(C) 7 (D) 12

2. "A visitor may enter only if the visitor has a ticket." Which condition must hold whenever entry is allowed?

(A) The visitor has a ticket. (B) The visitor bought two tickets.
(C) Every ticket holder enters. (D) The visitor has no ticket.

3. Rule: "If power and switch are both on, the lamp glows." Only the power is known to be on. What follows?

(A) The lamp must glow. (B) The lamp must be dark.
(C) The switch must be on. (D) The lamp's state is not determined.

4. Chess members: A, B. Music members: A, B, C. Who disproves "Every music member is a chess member"?

(A) A (B) B
(C) C (D) No student

5. Every Route R bus stops at the museum. A bus skips this stop. What follows?

(A) The bus is on Route R. (B) The bus is not on Route R.
(C) Every bus avoids the museum. (D) Route R has no buses.

SECTION B

(4 questions × 2 marks = 8 marks)

6. "If it rains, the road is wet." Write its converse and explain a counterexample.

7. Library rules: "Members may borrow"; "Only members may borrow." What restriction does the second add? Do membership and borrowing permission imply each other?

8. An event accepts applicants with verified phone or email. An applicant verifies only email. Must acceptance follow? Is phone verification necessary? Explain.

9. "Payment received before 5 p.m. today guarantees dispatch tomorrow." Write the converse. Can dispatch on credit disprove it? Explain.

SECTION C

(3 questions × 3 marks = 9 marks)

10. Rules: scholarship holders are enrolled; enrolled students have school IDs. Noor holds a scholarship; Kiran has a school ID.

(i) State two conclusions about Noor.
(ii) Must Kiran hold a scholarship?
(iii) Describe a situation supporting your answer to (ii).

11. Assume: "A broken seal means the parcel is rejected." Justify each conclusion below.

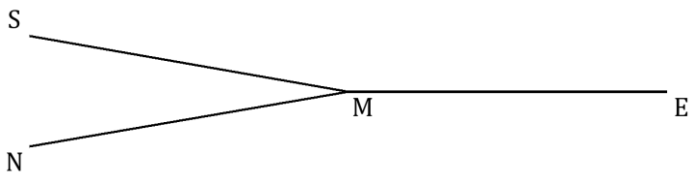
(i) A rejected parcel must have a broken seal.
(ii) An accepted parcel cannot have a broken seal.

12. A game defines a complete set as containing red, blue and green tokens. State the proposition and converse. Does either direction need another assumption? Explain.

SECTION D

(1 application question × 3 marks = 3 marks)

13. Visitors complete either N–M–E or S–M–E in figure. Claim: "If a visitor enters at N, the visitor passes M."



(i) Write the converse.
(ii) Test it using an allowed route.
(iii) State a true proposition about M and E whose converse is also true.