Mathematics — Ganita Manjari

Chapter 8 Test 9

Predicting What Comes Next: Exploring Sequences and Progressions

Class IX | 2026–27

Time Allowed: 45 Minutes | Maximum Marks: 25

General Instructions

1. All 13 questions are compulsory. Choose one option in A; show working in B–D.
2. No calculators. Give exact answers unless an approximation is requested.
3. Term positions start at 1 unless a stage number of 0 is explicitly given.

SECTION A

(5 questions × 1 mark = 5 marks)

1. If x, y, z are consecutive terms of an AP, which relation must hold?

(A) $y = xz$ (B) $y^2 = xz$

(C) $2y = x + z$ (D) $x + y = z$

2. If non-zero x, y, z are consecutive terms of a GP, which relation must hold?

(A) $y^2 = xz$

(B) $2y = x + z$

(C) $x^2 = yz$

(D) $x + y + z = 0$

3. Which AP has a first term that is positive and later contains negative terms?

(A) 2,5,8, … (B) 3,3,3, …

(C) $-4, -2, 0, \ldots$ (D) 7,5,3, …

4. A finite GP has first term a, ratio r and exactly 12 terms. Its last term is:

(A) ar^{12} (B) ar^{11}

(C) $12ar$ (D) $a + 11r$

5. Which of these is a recursive description?

(A) $t_n = 4n + 1$ (B) $t_1 = 5, t_{n+1} = t_n + 4$

(C) $t_n = n^2$ (D) $t_n = 3^n$

SECTION B

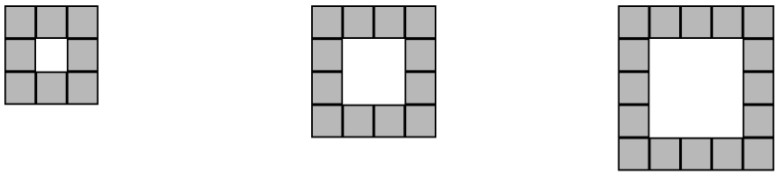
(4 questions × 2 marks = 8 marks)

6. Find k so that $k + 1, 2k - 1, 4k - 5$ are consecutive terms of an AP.

7. The GPs 3,6,12, … and 5,15,45, … are multiplied term by term. Find the first three products and the common ratio of the new sequence.

8. Figure shows hollow square borders made from unit tiles. The outer side lengths are 3, 4 and 5 tiles. Find a formula for the number of border tiles when the outer side is m tiles, and evaluate it for $m = 12$.

Side 3 Side 4 Side 5



9. An AP is 7,11,15, … ,83. Find its fifth term from the end without listing the whole AP.

SECTION C

(3 questions × 3 marks = 9 marks)

10. In an AP, $t_4 + t_8 = 24$ and $t_6 + t_{10} = 44$. Find the first term and common difference.

11. The model in figure multiplies its branch count by a fixed positive integer each stage. The counts at Stages 0 and 2 are correct. Find the missing count and decide whether the Stage 4 entry is correct; repair it if needed.

Stage	0	1	2	4
Branches	5	?	45	400

12. In a GP with non-zero terms, prove that its fourth, tenth and sixteenth terms form another GP.

SECTION D

(1 application question × 3 marks = 3 marks)

13. An auditorium has 18 seats in its first row and 2 more seats in each following row. Which row has 50 seats, and how many seats are in all rows up to and including that row?