Mathematics — Ganita Manjari

Chapter 8 Test 3

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. What is the common difference of 21,18,15,12, … ?

(A) 3 (B) -6

(C) 6 (D) -3

2. The non-zero constant sequence 7,7,7, … is:

(A) Only an AP (B) Both an AP and a GP

(C) Only a GP (D) Neither

3. In an AP, $t_9 - t_4$ equals:

(A) $5d$ (B) $13d$

(C) $4d$ (D) $9d$

4. For the AP $t_n = 8 - 5n$, its first term and common difference are:

(A) $8, -5$ (B) $-5, 8$

(C) $3, -5$ (D) $3, 5$

5. When consecutive positions and terms of an AP are plotted, the points lie:

(A) On a circle

(B) Only on the x-axis

(C) On a parabola

(D) On a straight line

SECTION B

(4 questions × 2 marks = 8 marks)

6. An AP has $t_{11} = 38$ and $t_{16} = 73$. Find d and t_{31}.

7. Insert two numbers between $\frac{1}{2}$ and $\frac{13}{2}$ so that the four numbers form an AP.

8. Figure shows a row of joined squares made from matchsticks. Each added square shares one side. Derive a rule for n squares and find the number of matchsticks for 20 squares.

Stage 1 Stage 2 Stage 3



9. For the AP 21,18,15, …, determine the position of 0 and the position of -81.

SECTION C

(3 questions × 3 marks = 9 marks)

10. Prove that in any AP, $t_3 + t_9 = 2t_6$. Does this require the common difference to be positive?

11. The third term of an AP is 16, and its seventh term exceeds its fifth term by 12. Find its first three terms.

12. A pupil proposes $t_n = 4n + 1$ for the AP in figure. Test this at positions 1 and 5, give the correct rule and explain the counting error.

Position	1	2	3	5
Term	1	5	9	17

SECTION D

(1 application question × 3 marks = 3 marks)

13. A worker earns ₹5,00,000 in the first year and receives a ₹20,000 annual increase. In which salary year is the salary ₹7,00,000, and how many yearly increases have occurred?