Mathematics — Ganita Manjari

Chapter 8 Test 2

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 main advantage of an explicit rule for finding the 200th term?

(A) It uses the position directly
(B) It requires all earlier terms
(C) It makes every term positive
(D) It applies only to an AP

2. Why is $t_n = t_{n-1} + 4$ alone insufficient to specify one sequence?

(A) The difference is negative
(B) The index must be zero
(C) The starting term is missing
(D) Recursive rules cannot describe APs

3. Which position does 137 occupy in $u_n = 2n - 1$?

(A) 68
(B) 137
(C) 70
(D) 69

4. Which statement is true of $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots$?

(A) It is an AP
(B) Its positive terms decrease
(C) It is a GP of ratio $1/2$
(D) Its terms eventually become negative

5. To use $u_n = u_{n-1} + u_{n-2}$ for $n \geq 3$, which data are sufficient?

(A) The first two terms
(B) Only the second term
(C) Only the common ratio
(D) The tenth term alone

SECTION B

(4 questions × 2 marks = 8 marks)

6. For $t_n = n^2 - 2n + 3$, find the first five terms. Is this sequence an AP?

7. The table in figure follows $t_n = 5n - 2$. Fill the missing term and decide whether 471 occurs in this sequence.

Position n	1	2	3	4	5
Term	3	8	13	?	23

8. Given $u_1 = 1$ and $u_n = 2u_{n-1} + 3$ for $n \geq 2$, find the next three terms.

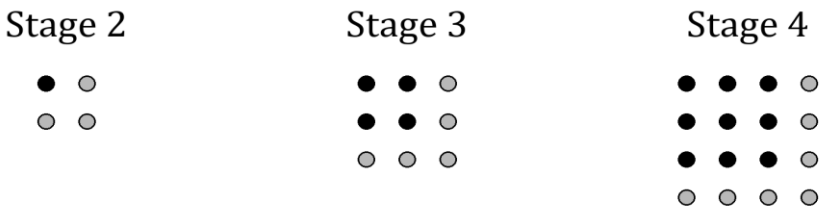
9. A sequence obeys $s_{n+1} = 3s_n - 2$. If $s_4 = 55$, find s_3 and s_2.

SECTION C

(3 questions × 3 marks = 9 marks)

10. Let $T_1 = 1, T_2 = 2, T_3 = 4$, and $T_n = T_{n-1} + T_{n-2} + T_{n-3}$ for $n \geq 4$. Find T_4, T_5, T_6 and explain why three starting terms are given.

11. In figure, a square of dots grows by adding an L-shaped border. Write a recursive rule for its dot count and find the number of new dots needed to grow Stage 9 into Stage 10.



12. Let $a_n = 3n - 2$ and let b_n be the sum of the first n terms of a_n. Find b_1 to b_5 and decide whether the sequence of sums is an AP.

SECTION D

(1 application question × 3 marks = 3 marks)

13. A child can take 1 or 2 steps at a time. Let W_n count the ordered ways to climb n steps. Given $W_1 = 1, W_2 = 2$, explain a recursive rule and find W_5.