

Sequences and Series — CBSE Pattern Test 1

Class 11 Maths · 90 minutes · 40 marks · Sections A–D with answer key · Narayan Gurukul Academy

Test 1 — CBSE Pattern (90 minutes, 40 marks)

Class 11 Maths · Sequences and Series · Narayan Gurukul Academy (ClassApna)

General Instructions: (1) This paper has four sections — Section A (1×10), Section B (2×4), Section C (3×4) and Section D (5×2) — total 40 marks. Time allowed: 90 minutes.
 (2) All questions are compulsory. No overall choice is given; internal choice, where allowed, is clearly marked.
 (3) For MCQ questions choose the single correct option; for VSA answers write a single line.
 (4) Take $g = 10 \text{ m/s}^2$. All symbols carry their usual meaning. Use of a calculator is not permitted.

Section A — MCQ & VSA ($10 \times 1 = 10$ marks)

1. A sequence is a function whose domain is
 - (A) the set of natural numbers
 - (B) the set of real numbers
 - (C) the set of integers
 - (D) the set of rationals
2. The n th term of an AP with first term a and common difference d is
 - (A) $a + (n - 1)d$
 - (B) $a + nd$
 - (C) $a - (n - 1)d$
 - (D) $an + d$
3. The sum of the first n terms of an AP is
 - (A) $n/2[2a + (n - 1)d]$
 - (B) na
 - (C) $n(a + d)$
 - (D) $a + nd$
4. The n th term of a GP with first term a and common ratio r is
 - (A) $ar^{(n-1)}$
 - (B) $a + (n-1)r$
 - (C) ar^n
 - (D) a/r^n
5. The arithmetic mean of two numbers a and b is
 - (A) $(a + b)/2$
 - (B) $\sqrt{ab}$
 - (C) $ab/2$
 - (D) $a + b$
6. The sum of the first n natural numbers is
 - (A) $n(n + 1)/2$
 - (B) n^2
 - (C) $n(n - 1)/2$
 - (D) $n(n + 1)(2n + 1)/6$
7. If a, b, c are in AP, then
 - (A) $2b = a + c$

- (B) $b^2 = ac$
 (C) $b = ac$
 (D) $a + b + c = 0$
8. The common difference of the AP 3, 7, 11, 15, ... is
 (A) 4
 (B) 3
 (C) 7
 (D) 11
9. Define a sequence.
10. Write the formula for the n th term of a GP.

Section B — Short Answer I ($4 \times 2 = 8$ marks)

11. What is a series?
12. Find the common difference of 3, 7, 11, 15, ...
13. Write the formula for the sum to infinity of a GP.
14. Find the geometric mean of 4 and 9.

Section C — Short Answer II ($4 \times 3 = 12$ marks)

15. Find the 10th term of the AP 2, 5, 8, ...
16. Find the sum of the first 20 terms of the AP 1, 3, 5, ...
17. Find the 6th term of the GP 3, 6, 12, ...
18. Find the sum of the first 10 natural numbers.

Section D — Long Answers ($2 \times 5 = 10$ marks)

19. The 5th term of an AP is 19 and the 12th term is 40. Find the AP and its 20th term.
20. The 3rd term of a GP is 24 and the 6th term is 192. Find the GP and its 8th term. Prove that $AM \geq GM$ for two positive numbers a and b .

Answer Key (Marking Scheme)

- Q1 — (A) the set of natural numbers. Q2 — (A) $a + (n - 1)d$. Q3 — (A) $\frac{n}{2}[2a + (n - 1)d]$. Q4 — (A) $ar^{(n-1)}$.
 Q5 — (A) $(a + b)/2$. Q6 — (A) $n(n + 1)/2$. Q7 — (A) $2b = a + c$. Q8 — (A) 4.
 Q9 — A function whose domain is the set of natural numbers.
 Q10 — $ar^{(n-1)}$.
 Q11 — The sum of the terms of a sequence.
 Q12 — 4.
 Q13 — $a/(1 - r)$ for $|r| < 1$.
 Q14 — 6.
 Q15 — 29.
 Q16 — 400.
 Q17 — 96.
 Q18 — 55.

Q19 — AP: 3, 7, 11, ...; 20th term = 79.

Q20 — GP: 6, 12, 24, ...; 8th term 768; proof via $(\sqrt{a} - \sqrt{b})^2 \geq 0$.