

Sequences and Series — CBSE Pattern Test 2

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

Test 2 — 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. The sum of the terms of a sequence is called a
 - (A) series
 - (B) progression
 - (C) difference
 - (D) ratio
2. The common ratio of the GP 2, 6, 18, 54, ... is
 - (A) 3
 - (B) 2
 - (C) 6
 - (D) 4
3. The sum to infinity of a GP with $|r| < 1$ is
 - (A) $a/(1 - r)$
 - (B) $a(r^n - 1)/(r - 1)$
 - (C) ar^n
 - (D) $a/(1 + r)$
4. The geometric mean of two positive numbers a and b is
 - (A) $\sqrt{ab}$
 - (B) $(a + b)/2$
 - (C) ab
 - (D) a/b
5. The sum of the squares of the first n natural numbers is
 - (A) $n(n + 1)(2n + 1)/6$
 - (B) $n(n + 1)/2$
 - (C) $[n(n + 1)/2]^2$
 - (D) n^2
6. If a, b, c are in GP, then
 - (A) $b^2 = ac$
 - (B) $2b = a + c$
 - (C) $b = a + c$
 - (D) $a = bc$
7. For two positive numbers, AM and GM satisfy
 - (A) $AM \geq GM$

- (B) $AM \leq GM$
 (C) $AM = GM$ always
 (D) $AM < GM$ always
8. The sum of the cubes of the first n natural numbers is
 (A) $[n(n + 1)/2]^2$
 (B) $n(n + 1)(2n + 1)/6$
 (C) $n(n + 1)/2$
 (D) n^3
9. Write the formula for the common difference of an AP.
10. Find the 6th term of the GP 3, 6, 12, ...

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

11. Define an arithmetic progression.
12. Find the common ratio of 2, 6, 18, 54, ...
13. State the relation between AM and GM.
14. If a, b, c are in AP, write the relation between them.

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

15. Find the 6th term of the GP 3, 6, 12, ...
16. Find the sum of the first 5 terms of the GP 1, 2, 4, ...
17. Find the sum of the squares of the first 10 natural numbers.
18. If 2, x , 8 are in GP, find x .

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

19. Find the sum of all natural numbers between 100 and 500 which are divisible by 7.
20. Find the sum to infinity of the GP $1 + 1/2 + 1/4 + \dots$. Insert three geometric means between 2 and 162.

Answer Key (Marking Scheme)

- Q1 — (A) series. Q2 — (A) 3. Q3 — (A) $a/(1 - r)$. Q4 — (A) $\sqrt{ab}$.
- Q5 — (A) $n(n + 1)(2n + 1)/6$. Q6 — (A) $b^2 = ac$. Q7 — (A) $AM \geq GM$. Q8 — (A) $[n(n + 1)/2]^2$.
- Q9 — $d = a_{n+1} - a_n$.
- Q10 — 96.
- Q11 — A sequence with a constant difference between consecutive terms.
- Q12 — 3.
- Q13 — $AM \geq GM$.
- Q14 — $2b = a + c$.
- Q15 — 96.
- Q16 — 31.
- Q17 — 385.
- Q18 — 4.
- Q19 — 17157.

Q20 — Sum to infinity = 2; geometric means 6, 18, 54.