QUICK DRILL · CBSE CLASS 11

Algebra — Sets, Relations & Functions, Sequences & Series

Applied Mathematics · Chapter 2 · 15 MCQs · 20 minutes · PYQ-tagged with time budgets

DATE	TOTAL MARKS	DURATION	MARKING	TARGET
_____	15	20 min	+1 / 0	⩾ 12/15

OBJECTIVES

Reinforce the four core topics of Algebra — Sets, Relations & Functions, Sequences & Series via 15 PYQ-derived MCQs. Identify weak sub-topics via concept-node IDs (see answer key). Build per-question time budget habit.

INSTRUCTIONS

Attempt all 15. Time budget shown per Q (use it as pacing guide). Mark answers (A/B/C/D) in the margin. Answer key + explanations on the last page. **Don't peek — score yourself honestly.**

SECTION · QUICK DRILL

Q 1–15 · 20 MIN

Q1. The number of subsets of the set {a, b, c, d} is:

(A) 4 **(B)** 8
(C) 16 **(D)** 12

PYQ 2023 · CBSE SQP · 1m · ? 30s

Q2. If |A| = 20, |B| = 28 and |A ∪ B| = 36, then |A ∩ B| equals:

(A) 8 **(B)** 10
(C) 12 **(D)** 14

PYQ 2024 · CBSE SQP · 2m · ? 35s

Q3. The interval [2, 7) contains:

(A) all x with 2 < x < 7 **(B)** all x with 2 ⩽ x ⩽ 7
(C) all x with 2 ⩽ x < 7 **(D)** all x with 2 < x ⩽ 7

PYQ 2022 · Annual Pattern · 1m · ? 30s

Q4. If A = {1, 2} and B = {3, 4, 5}, then |A × B| equals:

(A) 5 **(B)** 6
(C) 8 **(D)** 9

PYQ 2023 · Annual Pattern · 2m · ? 30s

Q5. Which of the following relations is NOT a function?

(A) {(1,2),(2,3),(3,4)} **(B)** {(1,2),(1,3),(2,4)}
(C) {(1,5),(2,5),(3,5)} **(D)** {(2,1),(3,1),(4,1)}

PYQ 2024 · CBSE SQP · 1m · ? 35s

Q6. For R = {(1, 4), (2, 5), (3, 6)}, the range is:

(A) {1, 2, 3} **(B)** {4, 5, 6}
(C) {1, 2, 3, 4, 5, 6} **(D)** {(1,4),(2,5),(3,6)}

PYQ 2022 · CBSE SQP · 2m · ? 30s

Q7. The 10th term of the AP 3, 7, 11, 15, ... is:

(A) 37 **(B)** 39
(C) 40 **(D)** 43

PYQ 2023 · CBSE SQP · 2m · ? 35s

Q8. The sum of the first 10 terms of the AP 3, 7, 11, ... is:

(A) 190 **(B)** 200
(C) 210 **(D)** 220

PYQ 2024 · Annual Pattern · 3m · ? 45s

Q9. The 5th term of the GP 2, 6, 18, 54, ... is:

(A) 108 **(B)** 162
(C) 216 **(D)** 486

PYQ 2023 · Annual Pattern · 2m · ? 40s

Q10. The sum of the first 5 terms of the GP 2, 6, 18, ... is:

(A) 242 **(B)** 243
(C) 246 **(D)** 728

PYQ 2024 · CBSE SQP · 3m · 45s

Q11. The sum of the infinite GP 8, 4, 2, 1, ... is:

(A) 12 **(B)** 14
(C) 16 **(D)** infinite

PYQ 2023 · CBSE SQP · 3m · 40s

Q12. The infinite GP 1, 2, 4, 8, ... has:

(A) sum 2 **(B)** sum 16
(C) no finite sum (it diverges) **(D)** sum 1

PYQ 2022 · Annual Pattern · 1m · 30s

Q13. The geometric mean of 4 and 9 is:

(A) 6 **(B)** 6.5
(C) 13 **(D)** 36

PYQ 2024 · Annual Pattern · 1m · 25s

Q14. In a class of 40, 25 like cricket, 20 like football and 10 like both. How many like neither?

(A) 5 **(B)** 10
(C) 15 **(D)** 35

PYQ 2023 · Annual Pattern · 3m · 45s

Q15. Which symbol is correct for '2 is an element of the set {1, 2, 3}'?

(A) $\{2\} \in \{1,2,3\}$ **(B)** $2 \subset \{1,2,3\}$
(C) $2 \in \{1,2,3\}$ **(D)** $\{2\} \in$ ... only as a subset

PYQ 2021 · CBSE SQP · 1m · 30s

ANSWER KEY & EXPLANATIONS

Q 1–15 · MARK YOUR SCORE

Q1. Answer: C

A set with n = 4 elements has $2^n = 2^4 = 16$ subsets (including ∅ and the set itself).

Q2. Answer: C

$|A \cap B| = |A| + |B| - |A \cup B| = 20 + 28 - 36 = 12$.

Q3. Answer: C

Square bracket at 2 includes it; round bracket at 7 excludes it: $2 \leqslant x < 7$.

Q4. Answer: B

$|A \times B| = |A| \cdot |B| = 2 \times 3 = 6$ ordered pairs.

Q5. Answer: B

In {(1,2),(1,3),...} the input 1 maps to two outputs (2 and 3), so it is not a function. The others give each input exactly one output.

Q6. Answer: B

The range is the set of second elements: {4, 5, 6}. (The domain — first elements — would be {1, 2, 3}.)

Q7. Answer: B

$a = 3, d = 4$; $a_{10} = a + 9d = 3 + 9 \times 4 = 39$.

Q8. Answer: C

$a = 3, d = 4$; $S_{10} = 10/2[2 \times 3 + 9 \times 4] = 5[6 + 36] = 5 \times 42 = 210$.

Q9. Answer: B

$a = 2, r = 3$; $a_5 = a \cdot r^4 = 2 \times 3^4 = 2 \times 81 = 162$.

Q10. Answer: A

$a = 2, r = 3$; $S_5 = 2(3^5 - 1)/(3 - 1) = 2(243 - 1)/2 = 242$.

Q11. Answer: C

$a = 8, r = 1/2, |r| < 1$; $S_\infty = a/(1 - r) = 8/(1 - 1/2) = 8/(1/2) = 16$.

Q12. Answer: C

$r = 2$, so $|r| = 2 \geqslant 1$. The terms grow without bound, so the infinite series has no finite sum.

Q13. Answer: A

$GM = \sqrt{(ab)} = \sqrt{(4 \times 9)} = \sqrt{36} = 6$.

Q14. Answer: A

|C ∪ F| = 25 + 20 − 10 = 35; neither = 40 − 35 = 5.

Q15. Answer: C

∈ is used between an element and a set: 2 ∈ {1,2,3}. (⊂ is used between two sets, e.g. {2} ⊂ {1,2,3}.)