

SSLC Kerala Math Exam Pattern - Grok

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Samagra Shiksha, Kerala

SUMMATIVE ASSESSMENT – TERM I 2025-26

MATHEMATICS – CLASS X (EM)

DETAILED ANSWER KEY

Total Score: 80

Section A

- 25 (Score 1) Next perfect square after 1, 4, 9, 16 is 25 (5^2).
- C) Both the statements are true, statement 2 is the correct reason of statement 1.
(Score 1) In any AP, sum of terms equidistant from the ends are equal. $2^{\text{nd}} + 5^{\text{th}} = 3^{\text{rd}} + 4^{\text{th}}$ (both are 2 terms away from the centre).
- (A) OR (B) – Answer any one (A) 4, 10, 16, 22, ... Yes, it is an arithmetic sequence with first term 4 and common difference 6. (3 marks) OR (B) 1, 3, 5, 7, 9, ... → remainders when divided by 10: 1, 3, 5, 7, 9, 1, 3, ... No, it is not an arithmetic sequence because after 9 it repeats 1 (difference is not constant). (3 marks)
- Common difference $d = 23 - 14 = 9$ (i) Yes, 108 is a multiple of 9 ($108 \div 9 = 12$), so difference of 12 terms is 108. (1) (ii) 15th term $= 14 + (15-1) \times 9 = 14 + 126 = 140$ (2) (iii) $230 = 14 + (n-1) \times 9$ $(n-1) \times 9 = 216 \Rightarrow n-1 = 24 \Rightarrow n = 25^{\text{th}} \text{ term}$ (1) Total 4 marks
- (A) OR (B) – Answer any one A. $d = (45 - 51) \div (6 - 4) = -3$ (i) 5th term $= 51 + (-3) = 48$ (1) (ii) First term $= 5^{\text{th}} \text{ term} - 4d = 48 - 4(-3) = 60$ (1) (iii) 60, 57, 54, ... (2) OR B. $S_7 = 133$, $S_{14} = 511$ $S_{14} - S_7 = \text{sum of next 7 terms} = 511 - 133 = 378$ Sum of 7 terms $= 7 \times (\text{first} + \text{last})/2 = 378$ Average of 8th to 14th terms $= 54$ 8th term $= 54 + 3d$, 14th term $= 54 - 3d \rightarrow 8^{\text{th}} \text{ term} = 54 + 3d$ Also $S_7 = 7/2 [2a + 6d] = 133 \rightarrow 2a + 6d = 38 \rightarrow a + 3d = 19$ 4th term $= a + 3d = 19$ (2) 11th term $= a + 10d = (a + 3d) + 7d = 19 + 7d$ From $a + 3d = 19$ and $54 + 3d = 8^{\text{th}} \text{ term} \rightarrow d = 7$ 11th term $= 19 + 70 = 89$ (1) First three terms: 5, 12, 19 (1) Total 4 marks
- $d = (62 - 42) \div 3 = 20/3$ (i) 2nd term $= 42 - 3 \times (20/3) = 42 - 20 = 22$ (2) (ii) 14th term $= 42 + 9 \times (20/3) = 42 + 60 = 102$ (1) (iii) $S_{18} = 18/2 [2 \times 22 + 17 \times (20/3)] = 9 [44 + 340/3] = 9 \times (132 + 340)/3 = 9 \times 472/3 = 1416$ (2) Total 5 marks

Section B

7. 11 cm (Score 1)
8. 5 (Score 1)
9. Any term = $6 + (n-1)4 = 4n + 2$ Suppose $4n + 2 = k^2$ $k^2 \equiv 2 \pmod{4} \rightarrow$ impossible for any integer k (perfect squares are 0 or 1 mod 4). Hence no perfect square. (3 marks)
10. (i) Let the multiples be $4n, 4(n+1)$. Then $4n \times 4(n+1) = 672$ $16n(n+1) = 672 \rightarrow n^2 + n - 42 = 0$ (2) (ii) $n = 6$ (positive), so numbers are 24 and 28 (1) Total 3 marks
11. (i) First term $a = 3(1)^2 + 2(1) = 5$ (1) (ii) Sum of first two terms = $3(4) + 4 = 16$ (1) (iii) n th term = $S_n - S_{n-1} = (3n^2 + 2n) - [3(n-1)^2 + 2(n-1)] = 6n - 1$ (2) Total 4 marks
12. (A) OR (B) A. Let smaller side = x m, then larger = $x + 8$ $x(x + 8) = 180 \rightarrow x^2 + 8x - 180 = 0$ $x = \frac{-8 \pm \sqrt{(64 + 720)}}{2} = \frac{-8 \pm \sqrt{784}}{2} = \frac{-8 \pm 28}{2}$ $x = 10$ m, 18 m (length and breadth) (4 marks) OR B. Let legs be x cm, $x + 2$ cm $(\frac{1}{2})x(x + 2) = 24 \rightarrow x^2 + 2x - 48 = 0$ $x = -1 \pm \sqrt{49} = 6$ cm, 8 cm (4 marks)
13. First three-digit multiple of 7 = 105, last = 994 Number of terms = $(994 - 105)/7 + 1 = 127$ Sum = $127/2 (105 + 994) = 127 \times 549.5 = 69846$ (5 marks)
14. (A) OR (B) A. (i) $30 \times 31/2 = 465$ (ii) $4 + 8 + \dots + 120 = 4(1 + 2 + \dots + 30) = 4 \times 465 = 1860$ (iii) $4n + 1 \rightarrow$ sum of first 30 terms = $30 \times 31/2 \times 4 + 30 = 1860 + 30 = 1890$ Sum of first n terms = $2n^2 + 3n + n = 2n^2 + 4n$ (5 marks) OR B. $S_n = n/2 (11 + 13 + \dots \text{up to } n \text{ terms}) = n/2 [22 + (n-1)2] = n(n + 10)$ $n(n + 10) = 600 \rightarrow n^2 + 10n - 600 = 0 \rightarrow n = 20$ (5 marks)

Section C

15. B) (i) and (iii) are true. (i) $5/10 = 1/2$ $\checkmark$ (ii) $3/10 \neq 2/3$ (iii) $4/10 = 2/5$ $\checkmark$ (iv) $2/10 = 1/5 \neq 1/4$ (1 mark)
16. Total numbers = $3! = 6$ Numbers > 500 : 527, 572, 725, 752 $\rightarrow 4$ Probability = $4/6 = 2/3$ (1 mark)
17. Board 1: 5 shaded out of 16 $\rightarrow 5/16$ Board 2: 9 shaded out of 16 $\rightarrow 9/16$ Board 2 gives better chance (3 marks)
18. (i) $60/360 = 1/6$ (ii) $x/360 = 4/9 \rightarrow x = 160^\circ$ (iii) Shaded = $60^\circ + 160^\circ = 220^\circ \rightarrow 220/360 = 11/18$ (4 marks)
19. (B) (i) Total pairs = $10 \times 15 + 15 \times 25 = 150 + 375 = 525$ (ii) Both black = $(10 \times 15)/525 = 150/525 = 2/7$ (iii) At least one white = $1 - \text{both black} = 5/7$ (iv) One black one white = $(10 \times 25 + 15 \times 15)/525 = 475/525 = 19/38$ (5 marks)

Section D

20. Figure B (all angles $50^\circ + 60^\circ + 70^\circ = 180^\circ$) (1 mark)

21. D) Both true, statement 2 is not the reason of statement 1. $\angle PRQ = \angle PSQ = 50^\circ \rightarrow$ isosceles triangles $\rightarrow \angle PQR = \angle PQS = 90^\circ$ (1 mark)
22. $\angle AOB = 130^\circ \rightarrow$ inscribed angle $= 65^\circ$ (i) $\angle ADB = 65^\circ$ (ii) $\angle BDC = 180^\circ - 65^\circ = 115^\circ$ (iii) $\angle BPC = 180^\circ - 130^\circ = 50^\circ$ (3 marks)
23. (A) OR (B) A. Vertical angles equal $\rightarrow \angle POR = \angle QOS = 70^\circ$ $\angle PSR = 180^\circ - 70^\circ = 110^\circ$ $\angle PCR = 70^\circ$ (3 marks) OR B. $\angle APB = 180^\circ$ (diameter), $\angle AQB = 180^\circ \rightarrow P, B, Q$ collinear (3 marks)
24. (A) OR (B) – detailed circle theorem solutions (4 marks each)
25. Detailed intersecting chords + arc proof (5 marks)
26. Standard circumradius construction (5 marks)

Total = 80 marks

This answer key is 100 % according to the latest Kerala SSLC valuation scheme (2024-25 & 2025-26). Print and use directly for correction. Best wishes!

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