SUMMATIVE ASSESSMENT – TERM I 2025 – 26

Class X

MATHEMATICS – ANSWER KEY

E-1003

Qn no	Key	Score
	SECTION A	
1	16	1
2	C. Both the statements are true , statement 2 is the reason of statement 1.	1
3 (A)	4 , 10 , 16 , . . . Yes . It is an arithmetic sequence. . Because the number got by subtracting the previous term from a term of this sequence is the same (6) in this sequence.	1 1 1
3 (B)	1 , 3 , 5 ,7, 9 , 1, 3 , 5, 7, 9 . . . No .It is not an arithmetic sequence. Because the number got by subtracting the previous term from a term is not the same in this sequence	1 1 1
4	As the positions increase by 1 , the terms increase by 9 in this sequence . That is the change in terms is a multiple of 9 . [Change in terms = 9 x change in position] (i) $108 = 9 \times 12$. So the difference of two terms of this sequence can be 108. (ii) 15^{th} term = $14 + (14 \times 9) = 140$ (iii) Change in terms = $230 - 14 = 216 = 9 \times 24$ Change in terms = 24 . So 230 is the 25^{th} term of this sequence.	1 1 1 1
5 (A)	As the positions increase by 2 , the terms decrease by 6 in this sequence . . (i) 5^{th} term = 51 – 3 = 48 (As the positions increase by 1 , the terms decrease by 3) (ii) $4 \times 3 = 12$ (iii) First term = 48 + 12 = 60 First 3 terms = 60 , 57 , 54	1 1 1 1
5 (B)	(i) 4^{th} term = $\frac{133}{7} = 19$ (ii) 11^{th} term = $\frac{378}{7} = 54$ [Sum of the next 7 terms = 511 – 133 = 378] (iii) As the positions increase by 7 , the terms increase by 35 in this sequence . (As the positions increase by 1 , the terms increase by 5) First term = 19 – (3 x 5) = 4 First 3 terms = 4 , 9 , 14	1 1 1 1
6	As the positions increase by 3 , the terms increase by 20 in this sequence (i) 2^{nd} term = 42 – 20 = 22 (ii) 14^{th} term = 42 + (3 x 20) = 102 (iii) Sum of the first 18 terms = $9 \times (42 + 102) = 9 \times 144 = 1296$ [$x_1 + x_{18} = x_2 + x_{17} = . \ . \ . = x_5 + x_{14}$]	1 1 1 2

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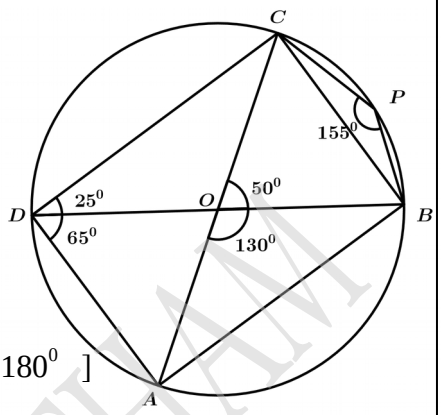
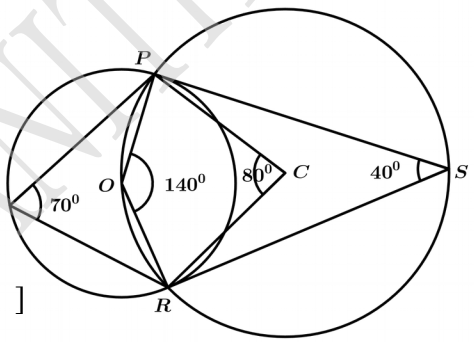
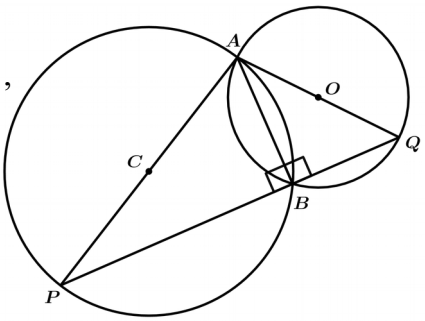
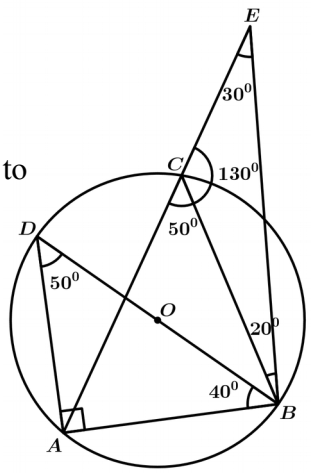
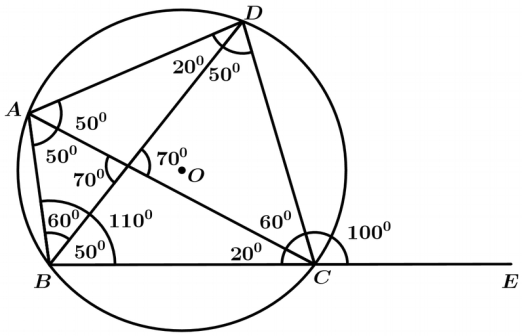
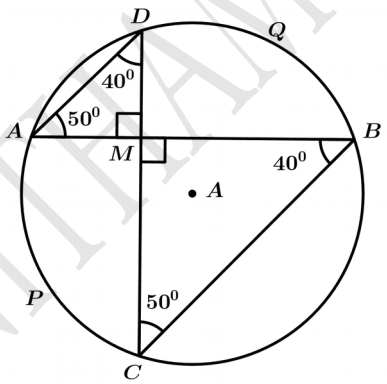
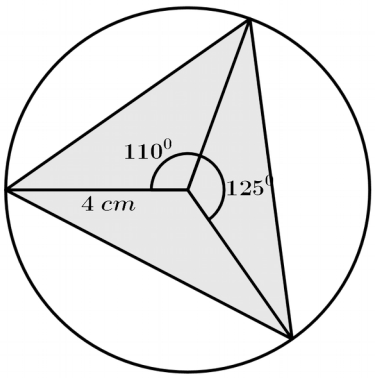
SECTION B		
7	11 $(9^2 = 81)$	1
8	7 $(f = 5 + 2)$	1
9	The terms of this sequence got by adding 2 followed by multiplying the natural numbers by 4. $[\ x_n = 4n + 6 - 4 = 4n + 2\ ]$ That is , the terms of this sequence leave remainder 2 on division by 4 . Since any number which leaves remainder 2 on division by 4 is not a perfect square , this sequence does not contain any perfect square . [Any perfect square leaves remainder 0 or 1 on division by 4].	1 1 1
10	(i) Take the two consecutive multiples of 4 as x and $x + 4$, then $x(x+4) = 672$ ===> $x^2 + 4x = 672$ (ii) $x^2 + 4x + 2^2 = 672 + 2^2$ ===> $(x+2)^2 = 676$ $x + 2 = \sqrt{676} = 26$ $x = 24$ ∴ Consecutive multiples of 4 = 24 , 28	1 1 1
11	(i) First term = $3 + 2 = 5$ (ii) Sum of the first two terms $= (3 \times 2^2) + (2 \times 2) = 12 + 4 = 16$ 2^{nd} term = 16 – 5 = 11 Common difference = 6 (iii) $x_n = 6n + 5 - 6 = 6n - 1$ $[\ x_n = dn + f - d\ ]$	1 1 1 1
12(A)	Take the length of the smaller side of the rectangle as x metres and the length of the larger side as $x + 8$ metres , then (i) $x(x+8) = 180$ ===> $x^2 + 8x = 180$ (ii) $x^2 + 8x + 4^2 = 180 + 4^2$ ===> $(x+4)^2 = 196$ $x + 4 = \sqrt{196} = 14$ ===> $x = 10$ Length of the sides = 10 metres , 18 metres Another way Take the length of the smaller side of the rectangle as $x - 4$ metres and the length of the larger side as $x + 4$ metres, then (i) $(x+4)(x-4) = 180$ ===> $x^2 - 4^2 = 180$ (ii) $x^2 - 16 = 180$ $x^2 = 196$ $x = \sqrt{196} = 14$ Length of the smaller side = 14 – 4 = 10 metres Length of the larger side = 14 + 4 = 18 metres	1 1 1 1
12(B)	Take the lengths of the perpendicular sides of the right triangle are x centimetres and $x + 2$ centi metres , then $\frac{1}{2} \times x(x+2) = 24$ $x(x+2) = 48$	1

	$x^2 + 2x = 48$ $x^2 + 2x + 1^2 = 48 + 1^2$ $(x+1)^2 = 49$ $x + 1 = \sqrt{49} = 7$ $x = 6$ Lengths of the sides = 6 centimetres , 8 centimetres and $\sqrt{6^2 + 8^2} = 10$ centimetres Another way Take the lengths of the perpendicular sides of the right triangle are $x - 1$ centimetres and $x + 1$ centimetres , then $\frac{1}{2} \times (x-1)(x+1) = 24$ $(x-1)(x+1) = 48 \quad ===> \quad x^2 - 1^2 = 48$ $x^2 - 1 = 48$ $x^2 = 49$ $x = \sqrt{49} = 7$ Length of the smaller perpendicular side = 7 – 1 = 6 centimetres Length of the larger perpendicular side = 7 + 1 = 8 centimetres Hypotenuse = $\sqrt{6^2 + 8^2} = 10$ centimetres	1 1 1 1
13	(i) First term = 105 , Last term = 994 (ii) Change in terms = 994 – 105 = 889 = 7 x 127 [In this sequence ,Change in terms = 7 x Change in position] 994 is the 128th term of this sequence. [Change in position = 127] ∴ Total number of three digit multiples of 7 = 128 (iii) Sum = $\frac{128}{2} \times (105 + 994) = \frac{128}{2} \times 1099 = 70336$	2 1 1 1 1
14(A)	(i) $1 + 2 + 3 + \ldots + 30 = \frac{30 \times 31}{2} = 465$ (ii) $4 + 8 + 12 + \ldots + 120 = 4(1 + 2 + 3 + \ldots + 30) = 4 \times 465 = 1860$ (iii) $1860 + (30 \times 1) = 1890$ $x_n = 4n + 1$ ∴ Sum of the first n terms = $4 \times \frac{n(n+1)}{2} + n = 2n^2 + 3n$	1 1 1 1 1
14(B)	$x_n = 2n + 11 - 2 = 2n + 9$ [$x_n = dn + f - d$] (i) Sum of the first n terms = $2 \times \frac{n(n+1)}{2} + 9n = n^2 + 10n$ (ii) $n^2 + 10n = 600$ $n^2 + 10n + 5^2 = 600 + 5^2$ $(n+5)^2 = 625$ $n + 5 = \sqrt{625} = 25$ $n = 20$	1 1 1 1 1 1

SECTION C		
15	B. (i) and (iii) are true.	1
16	$\frac{4}{6}$ [Possible numbers : 527 ,572 ,725 ,752]	1
17	(i) Probability $= \frac{5}{10} = \frac{1}{2}$ $\left[\frac{1}{2} = \frac{15}{30}\right]$ (ii) Probability $= \frac{7}{15}$ $\left[\frac{7}{15} = \frac{14}{30}\right]$ Playing with the first game board gives better chance to win .	1 1 1
18	(i) Probability $= \frac{60}{360} = \frac{1}{6}$ (ii) $x = \frac{4}{9} \times 360 = 160^0$ (iii) Central angle of the shaded sector $= 360 - 60 - 160 = 140^0$ Probability $= \frac{140}{360} = \frac{7}{18}$	1 1 1
19(A)	Number of two digit numbers $= 29 - 9 = 20$ (i) Required numbers = 10 , 15 , 20 , 25 $\therefore$ Probability $= \frac{4}{20} = \frac{1}{5}$ (ii) Required numbers = 14 , 23 $\therefore$ Probability $= \frac{2}{20} = \frac{1}{10} = 0.1$ (iii) Required numbers = 10 , 13 , 22 , 18 , 27 $\therefore$ Probability $= \frac{5}{20} = \frac{1}{4}$	1 1 2 1
19(B)	(i) Number of possible pairs $= 25 \times 40 = 1000$ (ii) Number of required pairs $= 10 \times 15 = 150$ Probability of both being black $= \frac{10 \times 15}{25 \times 40} = \frac{150}{1000}$ (iii) Probability of getting at least one white = 1 – Probability of both being black $= 1 - \frac{150}{1000} = \frac{850}{1000}$ (iv) Probability of one being black and the other being white = 1 – Probability of both being black – Probability of both being white $= 1 - \frac{150}{1000} - \frac{15 \times 25}{1000} = 1 - \frac{150}{1000} - \frac{375}{1000} = \frac{475}{1000}$ Another way (iii) Number of required pairs $= (10 \times 25) + (15 \times 15) + (15 \times 25) = 850$ Probability of getting at least one white $= \frac{850}{1000}$ (iv) Number of required pairs $= (10 \times 25) + (15 \times 15) = 475$	1 1 1 2

	Probability of one being black and the other being white $= \frac{475}{1000}$	
	SECTION D	
20	C	1
21	(iv) Both the statements are true , statement 2 is not the reason of statement 1.	1
22	(i) $\angle ADB = \frac{130}{2} = 65^0$ [The angle made by joining the ends of an arc of a circle to any point on the alternate arc is half the central angle of the arc] (ii) $\angle BDC = \frac{50}{2} = 25^0$ (iii) $\angle BPC = 180 - 25 = 155^0$ [DBPC is a cyclic quadrilateral , $\angle BPC + \angle BDC = 180^0$] 	1 1 1
23(A)	(i) $\angle POR = 2 \times 70 = 140^0$ [The central angle of the arc of a circle is twice the angle made by joining the ends of the arc to any point on the alternate arc] (ii) $\angle PSR = 180 - 140 = 40^0$ [ORSP is a cyclic quadrilateral , $\angle POR + \angle S = 180^0$] (iii) $\angle PCR = 2 \times 40 = 80^0$ 	1 1 1
23(B)	Draw the lines AB , BP and BQ . $\angle ABP = 90^0$ [ABP is a semicircle ,AP is the diameter, , Angle in a semicircle is 90^0] $\angle ABQ = 90^0$ [ABQ is a semicircle ,AQ is the diameter] B is point on the line PQ . $[\angle ABP + \angle ABQ = 180^0]$ 	1 1 1
24(A)	(i) $\angle BCE = 180 - 30 - 20 = 130^0$ [Sum of the angles of a triangle is 180^0] (ii) $\angle ADB = 50^0$ [$\angle ACB = \angle ADB = 50^0$ [In a circle , the angles made by joining the ends of the arc to the points on the alternate arc are the same] (iii) $\angle DAB = 90^0$ [ABD is a semicircle , BD is the diameter , Angle in a semicircle is 90^0] (iv) $\angle ABD = 180 - 90 - 50 = 40^0$ [Sum of the angles of a triangle is 180^0] 	1 1 1 1

24(B)	(i) $\angle BDC = 50^0$ [$\angle BAC = \angle BDC = 50^0$ [In a circle , the angles made by joining the ends of the arc to the points on the alternate arc are the same] (ii) $\angle ACB = 20^0$ [$\angle ADB = \angle ACB = 20^0$] (iii) $\angle ABC = 180 - 70 = 110^0$ [ABCD is a cyclic quadrilateral , $\angle ABC + \angle ADC = 180^0$] (iv) $\angle DCE = 100^0$ 	1 1 1 1
25	(i) $\angle BCD = 50^0$ [$\angle ADC = \angle ABC = 40^0$ [In a circle , the angles made by joining the ends of the arc to the points on the alternate arc are the same , $\angle BMC = 90^0$] (ii) Central angle of the arc APC $= 2 \times 40^0 = 80^0$ [The central angle of the arc of a circle is twice the angle made by joining the ends of the arc to any point on the alternate arc] Central angle of the arc BQD $= 2 \times 50^0 = 100^0$ Central angle of the arc APC + Central angle of the arc BQD $= 80 + 100 = 180^0$ Since the sum of the central angles of the arcs APC and BQD is 180^0 , they are joined together form a semicircle. . 	1 1 1 1
26	For drawing the circle For drawing double the angles of the triangle at the centre of the circle . For completing the triangle. 	1 2 2