KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD

Malleshwaram, Bengaluru – 560003

S.S.L.C. MODEL QUESTION PAPER – 02 – 2025-26

Subject: MATHEMATICS

(English Medium)

Subject Code: 81 – E

[Time: 3 Hours 15 Minutes]

[Max. Marks: 80]

General Instructions to the candidate:

1. This question paper consists of 38 questions.
2. Follow the instructions given against the questions.
3. Figures in the right hand margin indicate maximum marks for the questions.
4. The maximum time to answer the paper is given at the top of the question paper. It includes 15 minutes for reading the question paper.

I. Four alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet. **$8 \times 1 = 8$**

1. The degree of a cubic polynomial is,

   (A) 4 (B) 1

   (C) 3 (D) 2

2. The formula to find the midpoint of a class interval is,

   (A) $\frac{Upper\ class\ limit - Lower\ class\ limit}{3}$

   (B) $\frac{Upper\ class\ limit + Lower\ class\ limit}{2}$

   (C) $\frac{Upper\ class\ limit\ -\ Lower\ class\ limit}{2}$

   (D) $\frac{Upper\ class\ limit + Lower\ class\ limit}{3}$

3. If the lines representing the pair of linear equations $a_1x + b_1y + c_1=0$ and $a_2x + b_2y + c_2=0$ intersect each other, then the correct relation among the following is,

   (A) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ (B) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

   (C) $\frac{a_1}{b_2} = \frac{b_1}{a_2}$ (D) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

4. In an arithmetic progression, if the 3rd term is 13 and the 2nd term is 8,

   then the first term of the progression is,

   (A) 3 (B) 5

   (C) 4 (D) 2

5. The probability of an impossible event is,

   (A) 1 (B) 0
   (C) 0.5 (D) 1.5

6. The correct relation among the following is,

   (A) $tan^2\theta = sec^2\theta + 1$ (B) $sin\theta = \frac{1}{Sec\theta}$

   (C) $cot\theta = \frac{Sin\theta}{Cos\theta}$ (D) $sin^2\theta = 1 - cos^2\theta$

7. ΔABC and ΔDEF are similar and if $\frac{AB}{DE} = \frac{BC}{FD}$ then, the correct relation among the following is

   (A) ∠B = ∠E (B) ∠A = ∠D

   (C) ∠B = ∠D (D) ∠A = ∠F

8. Two cubes, each having volume of 64cm^3, are joined end to end to form a cuboid. The measure of the longest side of the cuboid is

   (A) 4cm (B) 8cm

   (C) 16cm (D) 128cm

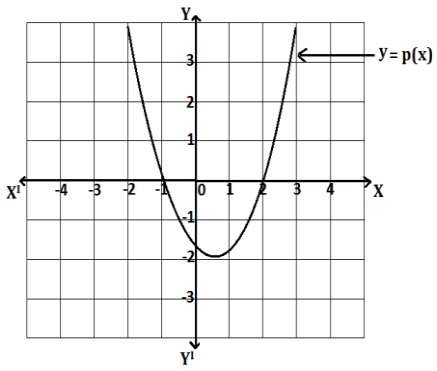
II. Answer the following questions : **$8 \times 1 = 8$**

9. State the fundamental theorem of arithmetic.

10. Write the nature of the roots of the quadratic equation $ax^2 + bx + c = 0$, if the value of its discriminant is '0'.

11. Write the coordinates of the point P which divides the line segment joining the points A $(x_1,\ y_1)$ and B $(x_2,\ y_2)$ internally in the ratio 1 : 1.

12. Write the zeroes of the polynomial $y = p(x)$ in the given graph.



13. "Five years ago, Noori's age(x) was thrice the age of Sonu(y)". Write the standard form of linear equation in two variables for this statement.

14. Write the formula to find the sum of first n terms of the arithmetic progression with first term 'a' and the last term 'l'.

15. Write the conditions for the similarity of two polygons having same number of sides.

16. The area of the base of a cylinder is 38.5 cm^2 and its height is 10cm. Find its volume.

III. Answer the following questions : **$8 \times 2 = 16$**

17. Prove that $2 + \sqrt{5}$ is an irrational number.

18. Solve the given pair of linear equations by elimination method.

$x + 2y = 10$
$x + y = 6$

19. Find the roots of the quadratic equation $3x^2 - 6x + 3 = 0$ by factorisation method.

OR

Express the equation $(x + 2)^3 = x^3 - 4$ in the standard form of quadratic equation.

20. Find the sum of the first 20 terms of the arithmetic progression 6, 10, 14,…… using formula.

OR

Find, which term of the arithmetic progression 2, 7, 12…….. is 47 using formula.

21. The lengths of two rectangular tables are 84cm and 126cm respectively and both have a width equal to 42cm. Find the maximum length of a square glass sheet that can exactly fit both the tables. Also, calculate the total number of glass sheets required to fit each table.

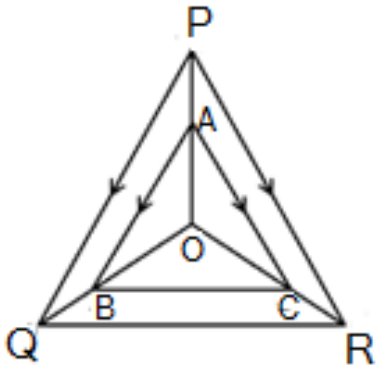
22. If $sin\ A = \frac{3}{5}$ then find the value of tan A

23. Find the coordinates of the point which divides the line segment joining the points (1, 6) and (4, 3) in the ratio 3 : 1 internally.

24. Two concentric circles of radii 5cm and 3cm are drawn with centre 'O'. Find the length of the chord of the larger circle which touches the smaller circle at point P as shown in the figure.

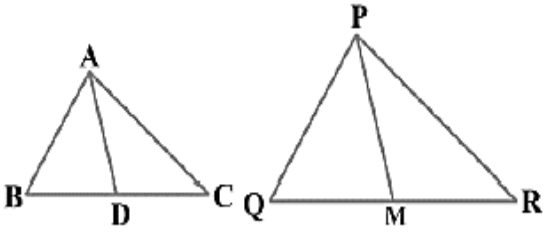
III. Answer the following questions : **$9 \times 3 = 27$**

25. In the figure, A, B and C are the points on OP, OQ and OR respectively such that $AB \parallel PQ$ and $AC \parallel PR$. Show that $BC \parallel QR$.



OR

Sides AB and BC and median AD of ΔABC are respectively proportional to sides PQ and QR and median PM of Δ PQR. Show that Δ ABC $\sim \Delta$ PQR



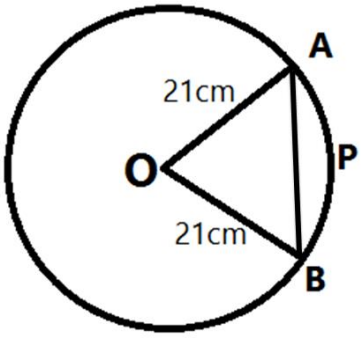
26. A bag contains 20 red balls and some blue balls. If the probability of drawing a blue ball from the bag is $\frac{1}{4}^{th}$ the probability of drawing a red ball then, find the number of blue balls and total number of balls in the bag.

27. The denominator of a fraction is one more than twice its numerator. The sum of this fraction and its reciprocal is $\frac{29}{10}$. Find the fraction.

OR

A cottage industry produces a certain number of pottery articles in a day. It was observed on a particular day that the cost of production of each article (in rupees) was 3 more than twice the number of articles produced on that day. If the total cost of production on that day was ₹ 90, find the number of articles produced and the cost of each article.

28. In the figure, 'O' is the centre of the circle with radius 21cm. The length of the arc APB is 22cm. Find the area of the segment APB.



29. Find the Mode for the following frequency distribution table.

Class Interval	Frequency
10-20	6
20-30	4
30-40	12
40-50	3
50-60	5

OR

Find the Median for the following frequency distribution table.

Class Interval	Frequency
15-20	4
20-25	5
25-30	10
30-35	5
35-40	6

30. If one of the zeroes of the polynomial $P(x) = 2x^2 - 8x + (k+1)$ is seven times the other, then find the value of ' k '.

31. Prove that "The tangent at any point of a circle is perpendicular to the radius through the point of contact".

32. Prove that $\sqrt{\frac{1+ sin\ A}{1- sin\ A}} = sec\ A + tan\ A$

OR

Prove that $(cosec\ A - sin\ A)(tan\ A + cot\ A) = cot\ A . cosec\ A$

33. The vertices of ΔABC are A (7, 2), B (9, 10) and C (1, 4) and E and F are the midpoints of AB and AC respectively. Prove that $EF = \frac{1}{2} BC$ using distance formula.

IV. Answer the following questions : **$4 \times 4 = 16$**

34. Solve the given pair of linear equations by graphical method

$$2x + y = 8$$
$$x - y = 1$$

35. The sum of the first 6 terms of an arithmetic progression is 42. If the ratio of the 10^{th} term to the 30^{th} term of the progression is 1:3, then find the 13^{th} term of the progression.

OR

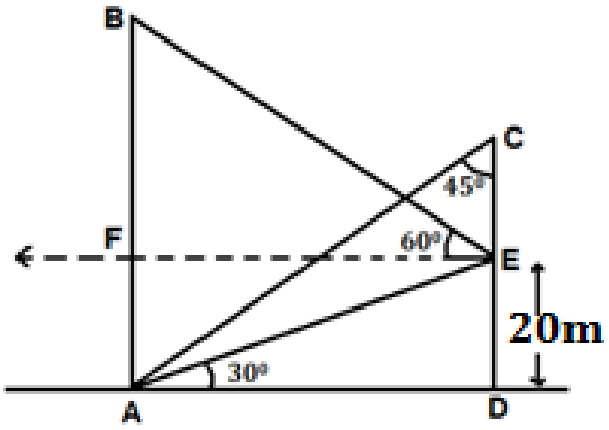
In an arithmetic progression, the sum of 4^{th} term and 8^{th} terms is 24, and sum of 6^{th} term and 10^{th} terms is 44. Find the arithmetic progression and also find the 25^{th} term of the progression.

36. Prove that "if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two are divided in the same ratio".

OR

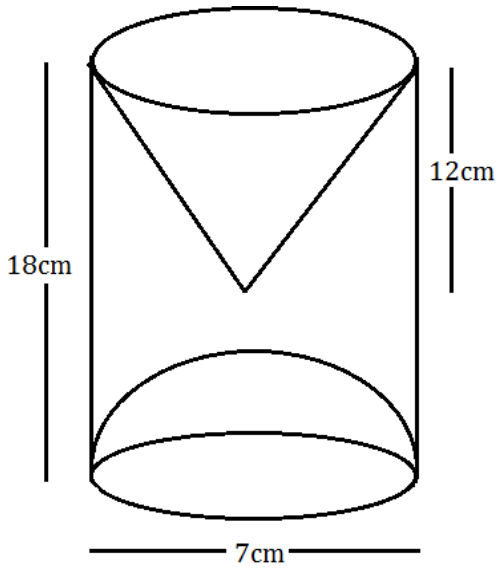
Prove that "If in two triangles, sides of one triangle are proportional to (i.e., in the same ratio of) the sides of the other triangle, then their corresponding angles are equal and hence the two triangles are similar."

37. A tower and a building stand vertically on a level ground. From the foot of the tower, the angle of elevation to a window of the building which is 20m above the ground is 30^0 as shown in the figure. From the same window, the angle of elevation to the top of the tower is 60^0. From the top of the building, the angle of depression to the foot of the tower is 45^0. Find the distance between the tower and the building, the height of the tower, the height of the building and the distance between the top of the building to the foot of the tower.



IV. Answer the following questions : **5× 1 = 5**

38. From a wooden cylinder of height 18cm and base diameter 7cm, a hemisphere and a cone having the same radius as that of the cylinder are carved out as shown in the figure. If the height of the cone is 12cm, then find the cost of painting the solid formed at the rate of ₹2.50 per cm^2.



OR

A solid toy is made by joining a right circular cone of height 12cm to a hemisphere of base radius 3.5cm. The toy is immersed in a cylindrical glass vessel completely filled with water as shown in the figure. If the diameter of the cylinder is 14cm and height of the cylinder is equal to the height of the toy, then find the volume of water left in the cylinder and also find the total surface area of the toy.