KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD

Malleshwaram, Bengaluru – 560003

S.S.L.C. MODEL QUESTION PAPER – 04 – 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 zeroes of the polynomial $p(x) = x^2 - 3$ are,

   (A) $3, -3$ (B) $\sqrt{3}, -\sqrt{3}$

   (C) $3, \sqrt{3}$ (D) 0, 3

2. In the pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$, if $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ then the lines represented by them are,

   (A) Intersecting lines (B) Perpendicular lines

   (C) Parallel lines (D) Coincident lines

3. The quadratic equation among the following is,

   (A) $x + 1 = 0$ (B) $x(x + 1) = 0$

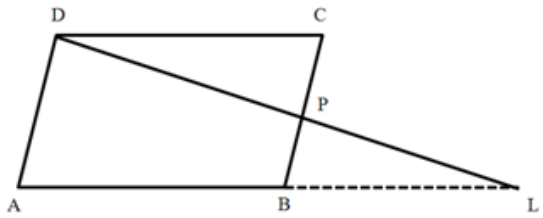
   (C) $x(x^2 + 1) = 0$ (D) $x(x + 1) = x^2$

4. If p and q are co-primes, then the H.C.F of p^2 and q^2 is,

   (A) pq (B) 1

   (C) p + q (D) p^2q^2

5. ABCD is a parallelogram. P is a point on BC. If AB and DP are produced to meet at L, then the correct relation among the following is ,



(A) $\frac{DP}{PL} = \frac{AB}{BL}$

(B) $\frac{DP}{BL} = \frac{DC}{PL}$

(C) $\frac{DP}{PL} = \frac{BL}{DC}$

(D) $\frac{DP}{PL} = \frac{AB}{DC}$

6. The lower limit of the modal class in the given frequency distribution table is,

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

(A) 35

(B) 20

(C) 30

(D) 40

7. Which of the following can be the probability of an event?

(A) $\frac{3}{2}$

(B) -1.5

(C) 105%

(D) 0.7

8. If $6, \ x \ , 14$ are in arithmetic progression, then the value of x is,

(A) 10 (B) 20
(C) 18 (D) 12

II. Answer the following questions : **8 X 1 = 8**

9. How many solutions do the pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ have, if the lines represented by them are intersecting?

10. Write a quadratic polynomial $p(x)$ whose zeroes are α and β.

11. If the first term of an arithmetic progression is 'm' and the common difference is 3 then find the 10th term of the progression.

12. Find the distance of the point $(-3, 4)$ from the origin.

13. What is the value of $\tan A \cdot \cot A - \cos A \cdot \sec A$?

14. Find the volume of a cube of edge 6cm.

15. A vertical pole of length 6m casts a shadow 4m long on the ground and at the same time, a building casts a shadow 28m long. Find the height of the building.

16. Find the surface area of a sphere of radius 7cm.

III. Answer the following questions : **8 X 2 = 16**

17. Find how many two digit numbers are divisible by 3?

OR

Find the sum of first 20 terms of the arithmetic progression $11,15,19,23,\ldots\ldots$

18. For what value of 'k' the roots of the equation $kx^2 + 6x + 1 = 0$ are equal ?

OR

Find the roots of the quadratic equation $x^2 - 3x - 10 = 0$

19. Prove that $5 - \sqrt{2}$ is an irrational number.

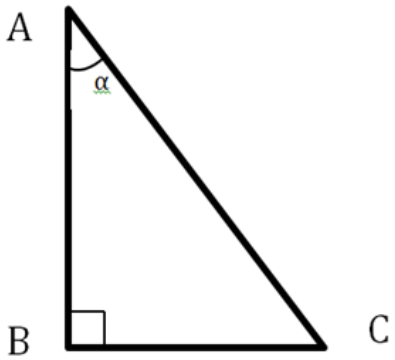
20. Solve the given pair of linear equations .

$$3x - y = 15$$
$$2x - y = 5$$

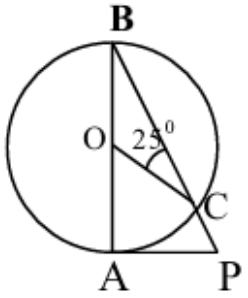
21. If the coordinates of the midpoint of the line segment joining the points A $(4, 6)$ and B (x, y) are $(6, 5)$ then find the coordinates of point B.

22. If the product of L.C.M and H.C.F of two numbers is 2366 and their HCF is 13, then find their LCM. If one of the numbers is 91, then find the other number.

23. In the figure, if the measure of hypotenuse is twice the opposite side of the angle α, then find the value of cos α.



24. In the figure 'O' is the centre of the circle, AB is the diameter and AP is the tangent drawn at the point A. If $\angle OCB = 25^0$, then find the measure of $\angle APB$.



IV. Answer the following questions: **9 X 3 = 27**

25. If α and β are the two zeroes of the polynomial $p(x) = x^2 + 3x + 2$, then find the value of $\alpha^3\beta + \alpha\beta^3$

26. Two line segments AB and CD intersect each other at a point *'O'*. AC and DB are joined such that AC || DB. Prove that $\frac{AO}{AC} = \frac{BO}{BD}$

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

28. Prove that $(sin\ A + cosec\ A)^2 + (cos\ A + sec\ A)^2 = 7 + tan^2\ A + cot^2 A$

OR

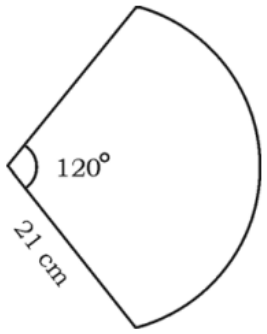
Evaluate: $\frac{tan\ 60^0}{cot\ 60^0} + \frac{sec\ 60^0}{2sin\ 90^0} - \frac{1}{cos^2\ 45^0}$

29. Find the coordinates of the point of trisection of the line segment joining the points $(2, -2)$ and $(-7, 4)$.

OR

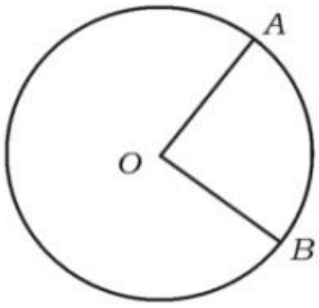
Prove that the points $A\ (1, 5)$, $B\ (2, 4)$ and $C\ (9, -3)$ are collinear using distance formula.

30. A hand fan is made up of cloth fixed in between the metallic wires. It is in the shape of a sector of a circle of radius $21cm$ and of angle $120°$ as shown in the figure. Calculate the area of the cloth used and also find the total length of the metallic wire required to make the hand fan.



OR

In the figure 'O' is the centre of the circle. Area of a sector AOB : Area of the circle = 1 : 5 and if the radius of the circle is 7cm, then find the length of the arc AB.



31. Three fair coins are tossed simultaneously. Find the probability of getting

(i) at least two heads

(ii) at most two tails.

32. The duration of the spacewalk of astronaut 'A' is 6 hours longer than the duration of the spacewalk of astronaut 'B'. If they both continue spacewalk for 4 more hours, the product of their spacewalk duration becomes 720 hours. Find the spacewalk durations of astronauts A and B.

33. Find the Mean for the following frequency distribution table

Class interval	Frequency
$5-15$	1
$15-25$	3
$25-35$	5
$35-45$	4
$45-55$	2

OR

Find the Median for the following frequency distribution table.

Class interval	Frequency
$100-150$	6
$150-200$	3
$200-250$	5
$250-300$	20
$300-350$	10

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

34. The 10^{th} term of an arithmetic progression is 2 more than the three times of the first term and the 8^{th} term is 6 more than twice the first term. Find how many terms of the progression make the sum 540.

OR

In an arithmetic progression the ratio of the first term and common difference is $3: 2$ and sum of first 26 terms is 1456. Find the arithmetic progression and also find which term of the progression is 62?

35. 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 sides are divided in the same ratio."

OR

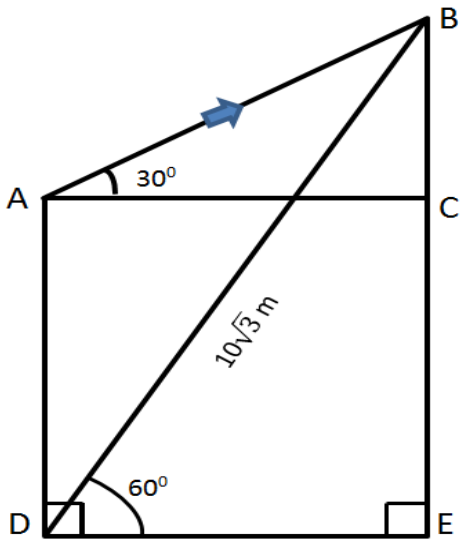
Prove that "If in two triangles, sides of one triangle are proportional to (i.e., in the same ratio of) the sides of the other triangle, then their corresponding angles are equal and hence the two triangles are similar."

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

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

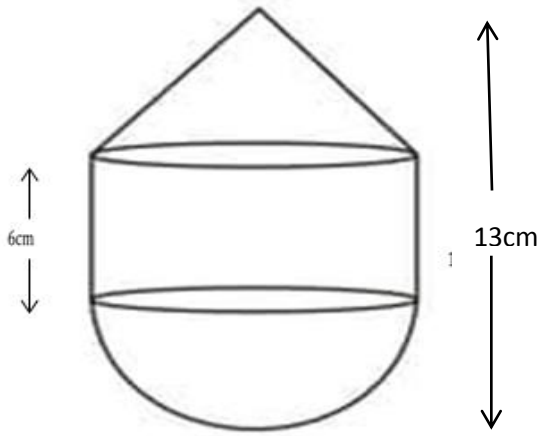
37. A building (AD) and a tower (BE) are standing vertically on a level ground as shown in the figure.

From the top of the building a drone travels for $10s$ and reaches the top of the tower along the straight line AB with an angle of elevation 30^0. The angle of elevation from the bottom of the building to the top of the tower is 60^0 and the distance(BD) between them is $10\sqrt{3}$ m. Find the height of the building, height of the tower, the distance (DE) between the building and the tower and speed of the drone.



VI. Answer the following questions : **$1 \times 5 = 5$**

38. A solid is made by joining a cylinder, a hemisphere and a cone of equal radii as shown in the figure. The height of the cylinder is $6cm$ and the total height of the solid is $13cm$. If the volume of the cylinder is three times the volume of the hemisphere then, find the volume and surface area of the solid.



OR

A rocket is built by combining a hollow cylinder and a cone as shown in the figure. The total height of the rocket is 44m and diameter and height of the cone are 6m and 4m respectively. Find the cost of installing heat-resistant coating on the outer surface of the rocket at the rate of ₹10,000 per m^2.