ರಾಜ್ಯ ಮಟ್ಟದ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪೂರ್ವಸಿದ್ಧತಾ ಪರೀಕ್ಷೆ – 2025

STATE LEVEL SSLC PREPARATORY EXAMINATION – 2025

ಜಿಲ್ಲೆ : **RA**

District : **RA**

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಇಂಗ್ಲಿಷ್ ಮಾಧ್ಯಮ / English Medium)

ವಿಷಯ ಸಂಕೇತ : **81-E** **Subject Code : 81-E**

ದಿನಾಂಕ : 27. 02. 2025] [Date : 27. 02. 2025

ಗರಿಷ್ಠ ಅಂಕಗಳು : 80] [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 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 the polynomial $p(x) = x^2 - x^3 + 2x + 1$ is

   (A) 2 (B) 3

   (C) -3 (D) 1

2. If 2, x, 12 are in Arithmetic progression, then the value of 'x' is

   (A) 7 (B) 6

   (C) 8 (D) 10

3. 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 their graphical representation is

   (A) Intersecting lines (B) Coincident lines

   (C) Parallel lines (D) Perpendicular lines

4. The formula to find the volume (V) of a sphere of radius 'r' units is

   (A) $V = 2\pi r^3$ cubic units

   (B) $V = \frac{4}{3}\pi r^3$ cubic units

   (C) $V = 3\pi r^3$ cubic units

   (D) $V = \frac{2}{3}\pi r^3$ cubic units

5. The sum of the probabilities of all the elementary events of an experiment is

(A) 0 (B) $\frac{1}{2}$

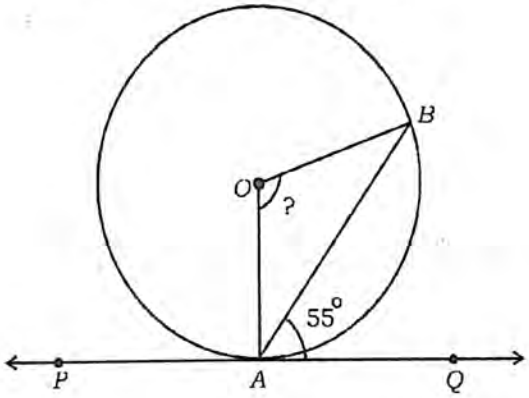
(C) 2 (D) 1

6. The value of the discriminant of the quadratic equation $x^2 + 4x + 4 = 0$ is

(A) 0 (B) 12

(C) 16 (D) 48

7. In the figure, PQ is a tangent to the circle with centre O. If $\angle BAQ = 55°$, then the measure of $\angle BOA$ is



(A) 90° (B) 120°

(C) 110° (D) 100°

8. The distance of the point $P(a, b)$ from the origin $(0, 0)$ is

(A) $a^2 + b^2$ (B) $\sqrt{a^2 - b^2}$

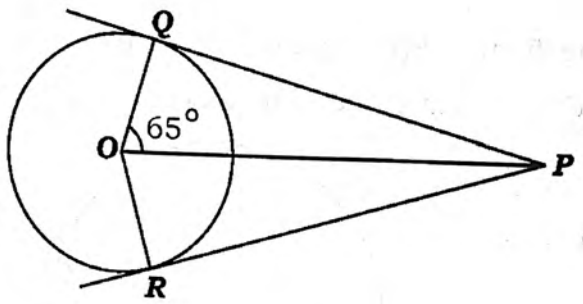
(C) $\sqrt{a + b}$ (D) $\sqrt{a^2 + b^2}$

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

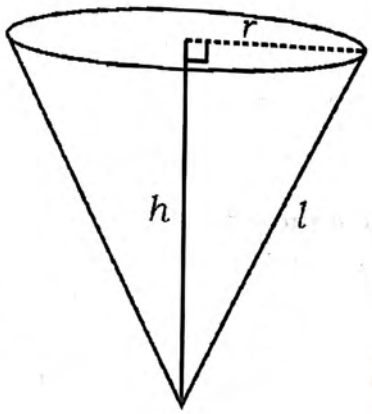
9. What is secant of a circle ?

10. State Thales (Basic proportionality) theorem.

11. In the given figure, PQ and PR are the tangents drawn from an external point P to the circle with centre O. If $\angle QOP = 65°$, find the measure of $\angle RPQ$.



12. Write the formula to find the total surface area of the solid given in the figure.



13. Write the 'median class' for the following cumulative frequency distribution table :

Marks	*Number of students*	*Cumulative frequency (c.f.)*
0 – 10	3	3
10 – 20	4	7
20 – 30	7	14
30 – 40	6	20
	$n = 20$	

14. If n^{th} term of an Arithmetic progression $a_n = 5n - 2$, then find the value of a_2.

15. The area of the sector of a circle with radius 7 cm is 22 cm^2. Find the area of the remaining part of the circle.

16. If a fair coin is tossed once, then write the number of possible outcomes.

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

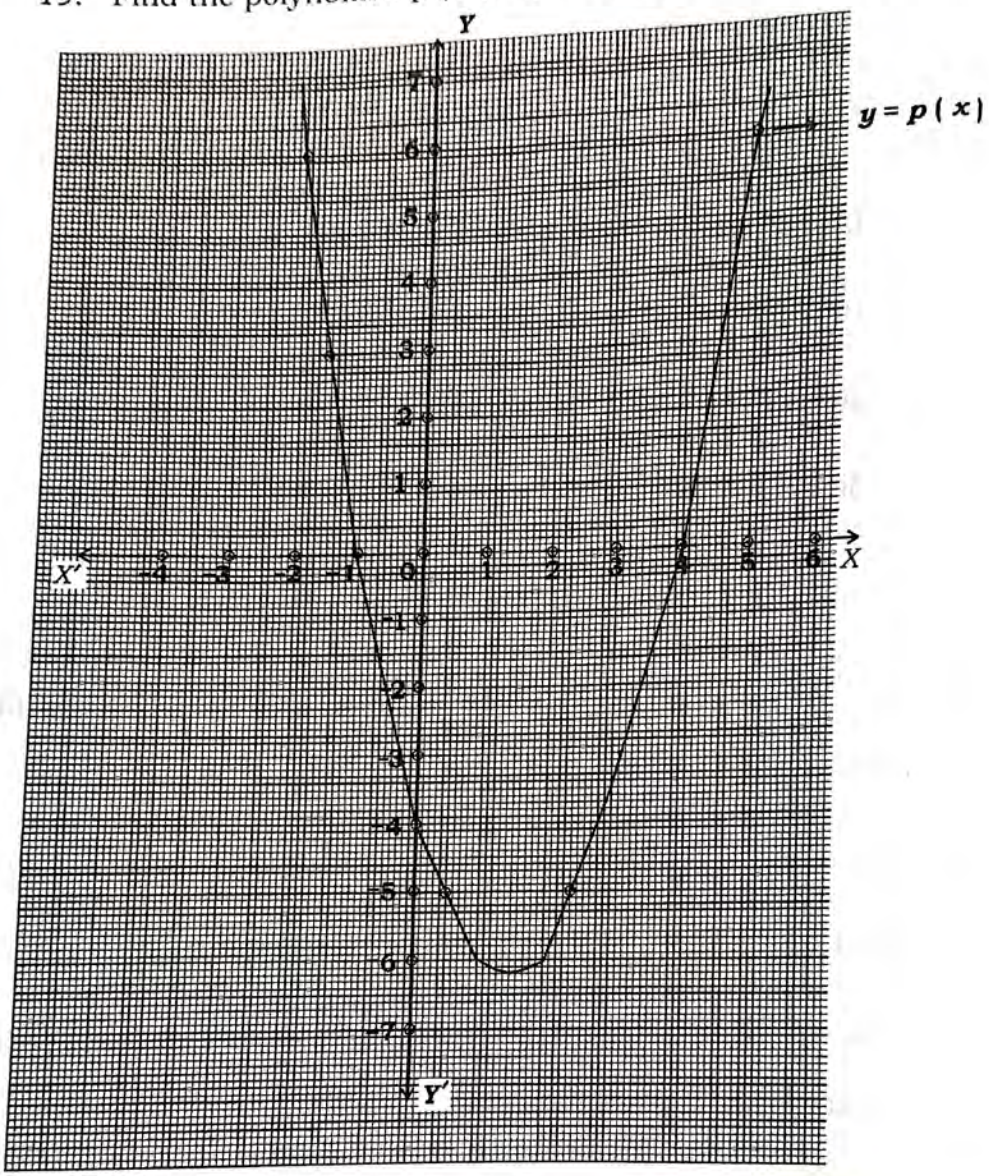
17. Prove that $5 + \sqrt{3}$ is an irrational number.

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

$$2x + y = 14$$

$$x - y = 4$$

19. Find the polynomial $p(x)$ represented in the given graph.



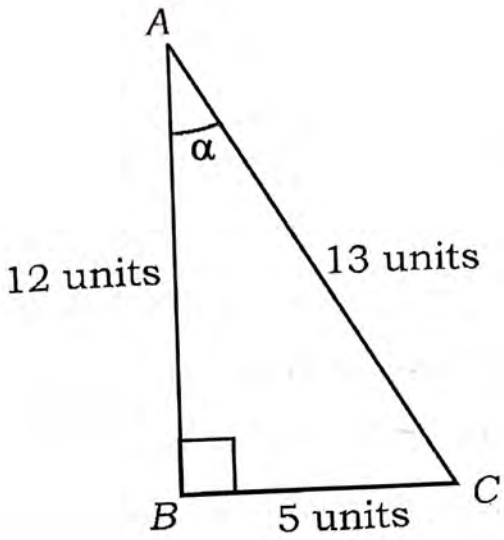
20. Find the roots of the quadratic equation $2x^2 + x - 6 = 0$.

21. Find the sum of first 20 terms of the Arithmetic progression 3, 7, 11, ... using formula.

OR

How many three-digit numbers are divisible by 7 ?

22. In the given figure, if $\angle ABC = 90°$, then find the value of cos α and cot α.



23. Find the distance between the points (3, 1) and (6, 4) using 'distance formula'.

24. A bag contains 3 red balls and 5 black balls. A ball is drawn at random from the bag. Find the probability that the ball drawn is not red.

OR

12 defective pens are accidentally mixed with 132 good ones. One pen is taken out at random from this lot. Find the probability that the pen taken out is a good one.

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

25. Find the LCM and HCF of the integers 510 and 92 by prime factorisation method and verify that LCM × HCF = Product of those two integers.

[Turn over

26. Find the zeroes of the quadratic polynomial $p(x) = 6x^2 - 7x - 3$ and verify the relationship between the zeroes and the coefficients.

27. In a school, it was decided to distribute Rs. 1500 equally among the students who get A^+ grade in the 10th standard Annual examination. After the results, 5 more students got A^+ grade than the expected students of A^+ grade before examination. As a result the amount received by each student was reduced by Rs. 25. Find the number of students who got A^+ grade after the result.

OR

Verify whether the following situation is 'possible or not' by finding the discrimnant of the quadratic equation for this situation.

Situation : The sum of ages of two friends is 20 years. Four years ago, the product of their ages in years was 48. If so, determine their present ages.

28. In ΔABC, $DE \parallel BC$. If $AD = 8$ cm, $DB = 12$ cm and $AE = 6$ cm then find the length of EC and also find $DE : BC$.

OR

If AD and PM are medians of triangles ABC and PQR respectively where $\Delta ABC \sim \Delta PQR$, then prove that $\frac{AB}{PQ} = \frac{AD}{PM}$.

29. Prove that "The lengths of tangents drawn from an external point to a circle are equal".

30. Prove that $\frac{\cos A}{1+\sin A} + \frac{1+\sin A}{\cos A} = 2 \sec A$.

OR

Evaluate : $\frac{5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$

31. Find the mean for the following data :

Class-interval	*Frequency*
2 – 6	2
6 – 10	5
10 – 14	6
14 – 18	5
18 – 22	2

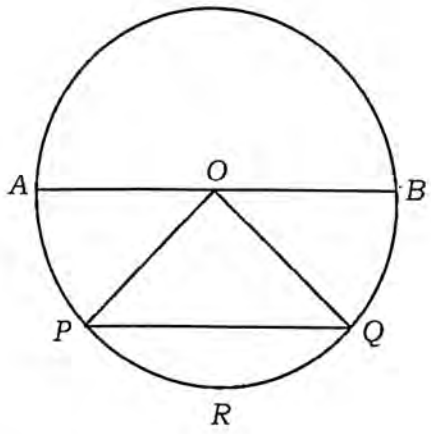
OR

Find the mode for the following data :

Class-interval	*Frequency*
0 – 6	6
6 – 12	8
12 – 18	10
18 – 24	9
24 – 30	7

32. Find the ratio in which the line segment joining the points $A(1, -5)$ and $B(-4, 5)$ is divided by the x-axis. Also find the coordinates of the point of division.

33. In the figure, the length of a semicircular arc of a circle with centre 'O' is 44 cm. If $\angle OPQ = 45°$, find the area of the segment PRQ.



V. Answer the following questions : **4 × 4 = 16**

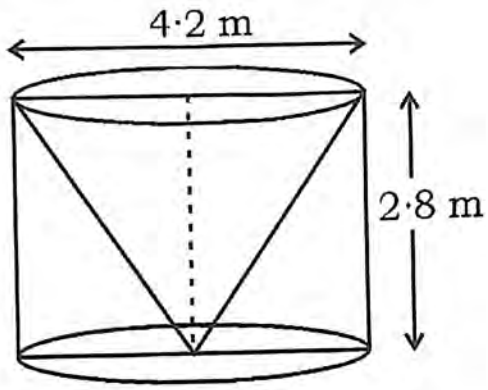
34. Find the solution of the given pair of linear equations by graphical method :

$$2x + y = 6$$

$$x + y = 4$$

35. Prove that "If in two triangles corresponding angles are equal, then their corresponding sides are in the same ratio (or proportion) and hence the two triangles are similar".

36. From a solid cylinder of height 2·8 m and diameter 4·2 m, a conical cavity of same height and same diameter is hollowed out. Find the total surface area of the remaining solid.



37. In an Arithmetic progression 4th term is 11 and 7th term exceeds the twice of the 4th term by 4. Write the Arithmetic progression. Also show that sum of the first term and 13th term of the progression is equal to twice its 7th term.

OR

An arithmetic progression consists of 30 terms in which the sum of the 4th and 8th terms is 24 and the sum of the 6th and 10th terms is 44. Find the last three terms of the arithmetic progression.

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

38. A pole AB is standing vertically on a level ground. Three wires from the top of the pole are stretched and tied to three different pegs on the ground. The angles of elevation from the pegs to the top of the pole are found to be 30°, 60° and 45° as shown in the figure. If the distance between the peg C and the foot B of the pole is 30 m, then find the height of the pole AB and also find the length of each wire.