

ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯನಿರ್ಣಯ ಮಂಡಲಿ
ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು - 560 003

KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD
Mallechwaram, Bengaluru - 560 003

2024-25ರ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ-4
S.S.L.C. MODEL QUESTION PAPER-4 - 2024-25

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಅಂಗ್ಲ ಮಾಧ್ಯಮ / English Medium)

ವಿಷಯ ಸಂಕೇತ : **81-E**

Subject Code : 81-E

ಸಮಯ : 3 ಗಂಟೆ 15 ನಿಮಿಷಗಳು]

[Time : 3 Hours 15 Minutes

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 is given at the top of the question paper.

It includes 15 minutes for reading the question paper.

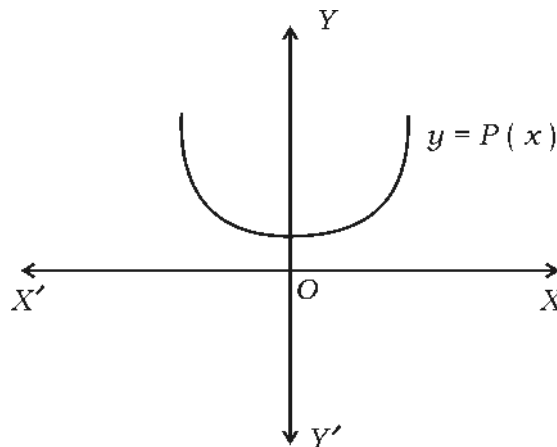
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- I. **Four alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.** **8 × 1 = 8**

1. The rational number in the following is,

- (A) $\sqrt{3}$ (B) $\sqrt{5}$
(C) $\sqrt{4}$ (D) $\sqrt{7}$

2. In the figure, graph of $y = P(x)$ is given. The number of zeroes of $P(x)$ is



- (A) 0 (B) 1
(C) 2 (D) 3
3. The pair of linear equations represents parallel lines. If one of the equations is $2x + 3y - 8 = 0$, then the other equation is
- (A) $4x + 6y - 9 = 0$ (B) $9x + 3y + 12 = 0$
(C) $18x + 6y + 24 = 0$ (D) $2x - y + 9 = 0$

4. The standard form of the quadratic equation is

(A) $ax^2 + bx = 0$

(B) $ax^2 - bx = c$

(C) $ax^2 + bx + c = 0$

(D) $ax^3 + bx + c = 0$

5. The distance between the points $A(x_1, y_1)$ and $B(x_2, y_2)$ is

(A) $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

(B) $\sqrt{(x_2 + x_1)^2 - (y_2 + y_1)^2}$

(C) $\sqrt{(x_1 + x_2) + (y_2 + y_1)}$

(D) $\sqrt{x^2 + y^2}$.

6. The formula to calculate the n^{th} term of an arithmetic progression is

(A) $a_n = a + (n - 1)d$

(B) $a_n = a - (n - 1)d$

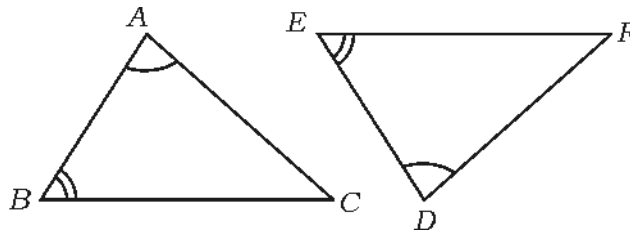
(C) $a_n = a + (n + 1)d$

(D) $a_n = a + (n - 1)$

7. The formula to find the mean of given data by step-deviation method is

- (A) $\bar{X} = \frac{\sum f_i x_i}{\sum f_i}$
- (B) $\bar{X} = a + \left[\frac{\sum f_i u_i}{\sum f_i} \right] h$
- (C) $\bar{X} = a + \frac{\sum f_i u_i}{\sum f_i}$
- (D) $\bar{X} = a - \left[\frac{\sum f_i u_i}{\sum f_i} \right] h$

8. $\triangle ABC \sim \triangle DEF$. Which one of the following relations is correct ?



- (A) $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$
- (B) $\frac{AB}{DF} = \frac{BC}{EF} = \frac{AC}{DE}$
- (C) $\frac{AB}{BC} = \frac{DE}{EF} = \frac{DF}{AC}$
- (D) $\frac{AB}{AC} = \frac{DE}{EF} = \frac{BC}{DF}$

II. Answer the following questions :

8 × 1 = 8

9. Write the HCF of any two prime numbers.

10. Write the degree of a cubic polynomial.

11. Write the number of solutions that the pair of linear equations $2x - 5y + 4 = 0$ and $2x + y - 8 = 0$ have.
12. Write the nature of roots of the quadratic equation $x^2 - 9 = 0$.
13. Find the coordinates of the midpoint of the line segment joining the points $A(5, 4)$ and $B(1, 4)$.
14. Write the value of $\sin^2 90^\circ$.
15. If E is an event related to probability, then write the value of $P(E) + P(\bar{E})$.
16. In the frequency distribution of data, if Mean is 25 and Median is 40, then calculate the value of Mode.

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

17. Calculate the sum of first 20 terms of an arithmetic progression 3, 5, 7, using formula.
18. Solve the given pair of linear equations $x + y = 8$ and $x - y = 2$.
19. Find the roots of the quadratic equation $x^2 + 4x - 60 = 0$.

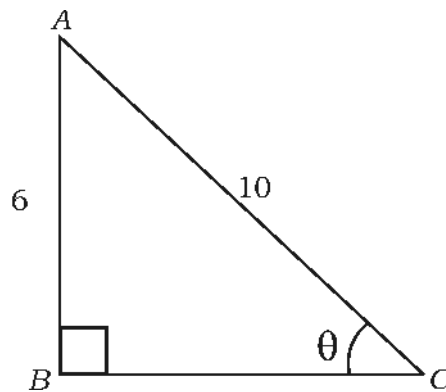
20. Find the value of 'x', if the distance between the points (3, 1) and (0, x) is 5 units.

OR

A circle passes through the point (- 7, 1). If the centre of circle is (- 5, 4), then find the radius of the circle.

21. The coordinates of the point of trisection of the line joining the points $A (2, - 2)$ and $B (- 7, 4)$ is $P (x, y)$. Find the value of x and y .

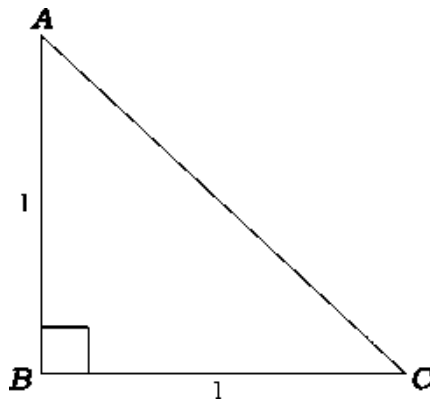
22. In the figure, find the values of



- i) cosec θ
- ii) tan θ .

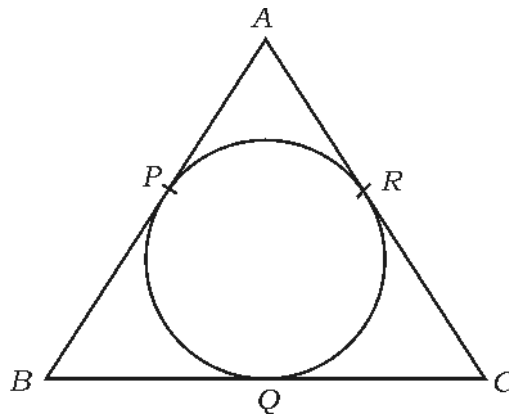
OR

In a triangle ABC , $\angle B = 90^\circ$. Prove that $2 \sin A \cdot \cos A = 1$.



23. A box contains 20 cards which are numbered from 1 to 20. If a card is drawn randomly from the box, then find the probability of getting perfect square numbered card.

24. In the figure, if $\overline{AB} = \overline{AC}$, then prove that $\overline{BQ} = \overline{QC}$.



IV. Answer the following questions :

9 × 3 = 27

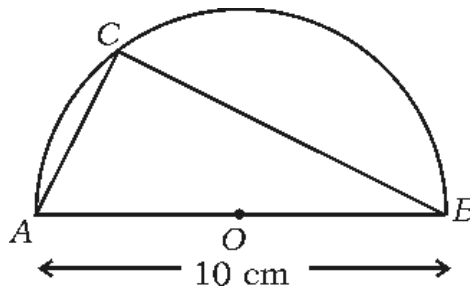
25. Find the zeroes of the polynomial $P(x) = x(x - 4)$ and verify the relationship between the zeroes and the coefficients.

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26. The base of a triangle is 4 cm more than twice its height. If the area of triangle is 48 square cm, then calculate the base and height of the triangle.

OR

- Some students planned a picnic. The budget for the food was Rs. 900. As 10 of them failed to join the party, the cost of the food for each member is increased by Rs. 15. Find how many students went for the picnic.
27. In the given figure ACB is a semicircle. If $AB = 10$ cm and $AC = 6$ cm, then find the area of the segments in the semicircle.



28. A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top, which is open, is 5 cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped in the vessel.

OR

A hemispherical section is cut out from one face of a cubical wooden block such that the diameter 7 cm of the hemisphere is equal to the edge of the cube. Determine the surface area of the remaining solid.

29. Prove that $\sqrt{5}$ is an irrational number.

30. D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$.

Show that $AB \cdot AC = AD \cdot BC$.

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

32. Prove that $\sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}} + \sqrt{\frac{1 - \sin \theta}{1 + \sin \theta}} = 2 \sec \theta$.

OR

Prove that $(\sqrt{3} + 1)(3 - \cot 30^\circ) = \tan^3 60^\circ - 2 \sin 60^\circ$.

33. Calculate the mean for the following grouped data :

<i>Class Interval</i>	<i>Frequency</i>
10 – 20	4
20 – 30	6
30 – 40	5
40 – 50	4
50 – 60	1

$$\Sigma f_i = 20$$

OR

[Turn over

Calculate the median for the following grouped data :

<i>Class Interval</i>	<i>Frequency</i>
0 – 20	6
20 – 40	9
40 – 60	10
60 – 80	6
80 – 100	7

V. Answer the following questions :

4 × 4 = 16

34. A question paper consists of 15 questions in total. Each question carries marks equal to the number of questions. If Dhanya answers the first 4 questions correctly, misses the next two questions and answers all the subsequent questions correctly, then find the total marks got by Dhanya using formula

OR

The seventh term of an arithmetic progression is four times the second term. Also the twelfth term is 2 more than thrice of fourth term. Find the arithmetic progression.

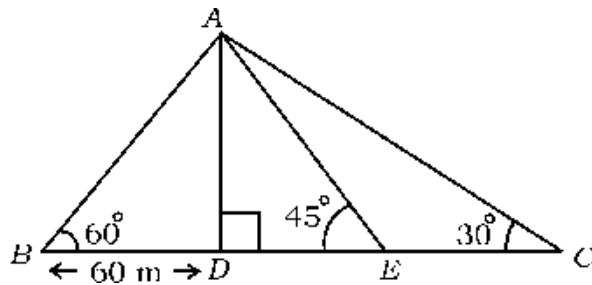
35. Find the solution of the following pair of linear equations by the graphical method :

$$x - y = 2$$

$$2x + y = 7$$

36. The maximum volume of a closed cylindrical tank is 6160 m^3 . The diameter of its circular base is 28 m. Find the cost of painting its surface at the rate of Rs. 5 per square metre.
37. In the given figure, find the length of DE , EC , AC and AB . Given $BD = 60 \text{ m}$.

(Take $\sqrt{3} = 1.7$)



VI. Answer the following question :

1 × 5 = 5

38. State and prove Basic Proportionality theorem (Thales theorem).

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