ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 16]

Total No. of Printed Pages : 16]

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 38]

Total No. of Questions : 38]

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Code No. : 81-E

A

CCE RF
UNREVISED
FULL SYLLABUS

Question Paper Serial No. **100**

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಇಂಗ್ಲಿಷ್ ಮಾಧ್ಯಮ / English Medium)

(ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / Regular Fresh)

ದಿನಾಂಕ : 03. 04. 2023]   [Date : 03. 04. 2023

ಸಮಯ : ಬೆಳಿಗ್ಗೆ 10-30 ರಿಂದ ಮಧ್ಯಾಹ–1-45 ರವರೆಗೆ]

[Time : 10-30 A.M. to 1-45 P.M.

ಗರಿಷ್ಠ ಅಂಕಗಳು : 80]   [Max. Marks : 80

General Instructions to the Candidate :

1. This question paper consists of objective and subjective types of 38 questions.

2. This question paper has been sealed by reverse jacket. You have to cut on the right side to open the paper at the time of commencement of the examination. Check whether all the pages of the question paper are intact.

3. Follow the instructions given against both the objective and subjective types of questions.

4. Figures in the right hand margin indicate maximum marks for the questions.

5. 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.

[Turn over

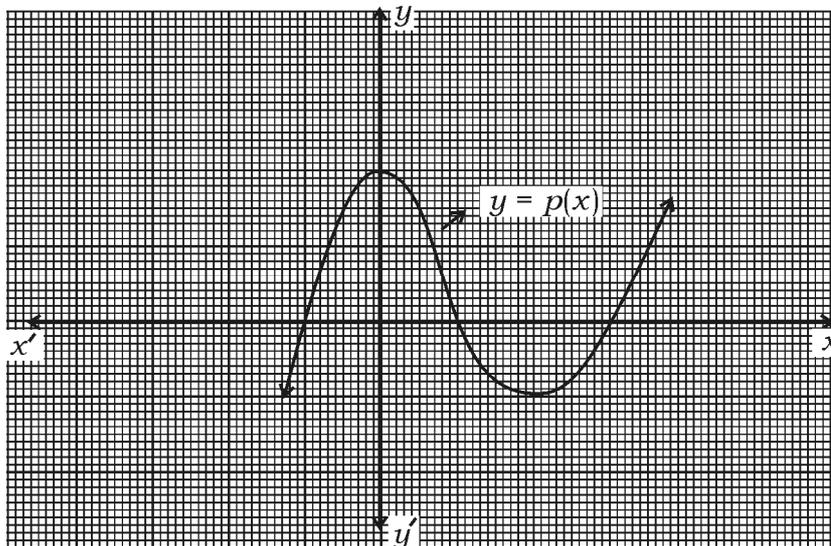I. *Four* alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.   **8 × 1 = 8**

1. The number of zeroes of the polynomial $y = p(x)$ in the given graph is

(A) 3   (B) 2

(C) 1   (D) 4

2. For an event 'E', if $P(E) = 0·75$, then $P(\overline{E})$ is
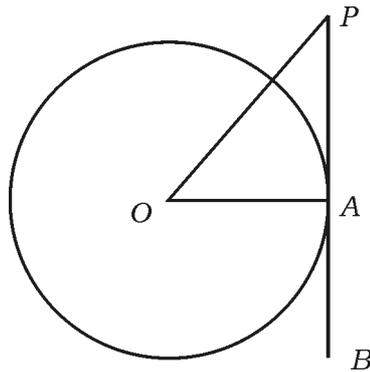
(A) 2·5   (B) 0·25

(C) 0·025   (D) 1·25

3. The total surface area of a right circular cylinder having radius 'r'

   and height 'h' is

   (A) $\pi r (r + h)$ (B) $2\pi rh$

   (C) $2\pi r (r - h)$ (D) $2\pi r (r + h)$

4. The number that represents the remainder when $19 = 6 \times 3 + 1$

   is compared with Euclid's division lemma $a = bq + r$ is
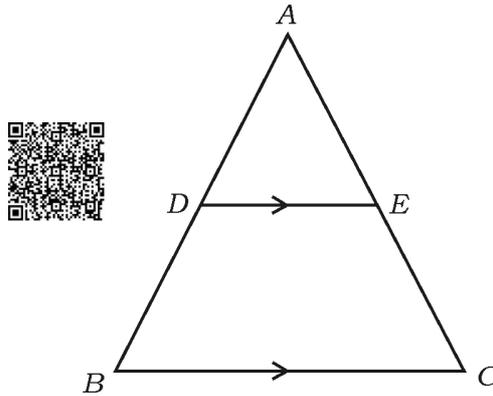
   (A) 3   (B) 6

   (C) 1   (D) 19

5. In the given figure, PB is a tangent drawn at the point A to the

   circle with centre 'O'. If $\angle AOP = 45°$, then the measure of

   $\angle OPA$ is

   (A) 45°   (B) 90°

   (C) 35°   (D) 65°

[Turn over

6. In the figure, if *DE || BC*, then the correct relation among the following is

(A) $\dfrac{AD}{AB} = \dfrac{AE}{EC}$

(B) $\dfrac{AD}{DB} = \dfrac{EC}{AE}$

(C) $\dfrac{AD}{DB} = \dfrac{AE}{EC}$

(D) $\dfrac{DB}{AD} = \dfrac{AE}{EC}$

7. The lines represented by the equations $4x + 5y - 10 = 0$ and $8x + 10y + 20 = 0$ are

(A) intersecting lines

(B) perpendicular lines to each other

(C) coincident lines

(D) parallel lines

8. The distance of the point (– 8, 3) from the *x*-axis is

    (A)   – 8 units

    (B)   3 units

    (C)   – 3 units

    (D)   8 units

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

9. Express the denominator of $\dfrac{7}{80}$ in the form of $2^n \times 5^m$.

10. If the pair of lines represented by the linear equations

    $x + 2y – 4 = 0$ and $ax + by – 12 = 0$ are coincident lines, then find

    the values of '*a*' and '*b*'.

11. $\Delta\ ABC \sim \Delta\ PQR$. Area of the $\Delta\ ABC$ is 64 cm^2 and the area of the

    $\Delta\ PQR$ is 100 cm^2. If $AB = 8$ cm, then find the length of *PQ*.

[Turn over

12. Express the equation $x (2 + x) = 3$ in the standard form of a quadratic equation.

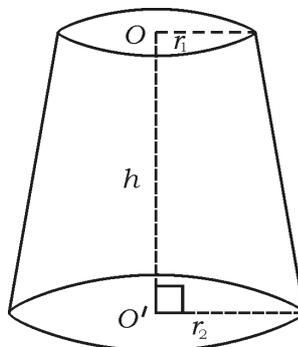13. Find the discriminant of the quadratic equation $2 x^2 - 4x + 3 = 0$.

14. Find the coordinates of the mid-point of the line segment joining the points $(6, 3)$ and $(4, 7)$.

15. Write the degree of the polynomial

$P (x) = 3 x^3 - x^4 + 2x^2 + 5x + 2.$

16. Write the formula to find the volume of the frustum of a cone given in the figure.

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

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

OR

Find the H.C.F. of 72 and 120 by using Euclid's division algorithm.

18. Solve the given pair of linear equations :

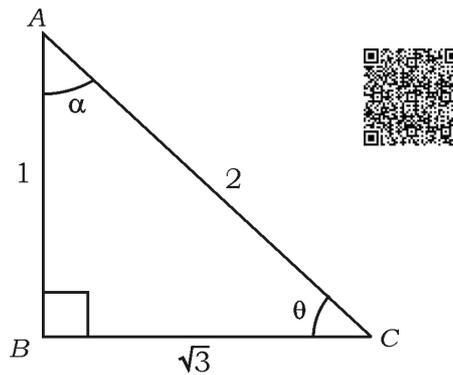$$3x + y = 12$$

$$x + y = 6$$

19. Find the 20th term of the Arithmetic progression 4, 7, 10, ... by using formula.

20. Find the roots of the equation $2x^2 - 5x + 3 = 0$ by using 'quadratic formula'.

OR

Find the roots of the equation $5x^2 - 6x - 2 = 0$ by the method of completing the square.
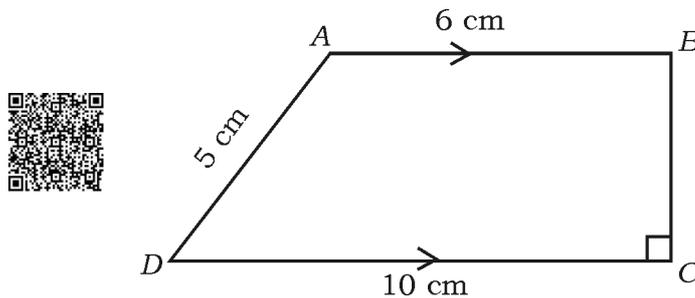
[Turn over

21. In the given figure, if $\underline{|\ ABC}$ = 90°, then find the values of sin θ and cos α.

22. A box contains cards which are numbered from 9 to 19. If one card is drawn at random from the box, find the probability that it bears a prime number.

23. In the given figure, ABCD is a trapezium in which AB || DC, and BC ⊥ DC. If AB = 6 cm, CD = 10 cm and AD = 5 cm, then find the distance between the parallel lines.

24. Draw a circle of radius 4 cm and construct a pair of tangents to the circle such that the angle between them is 60°.

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

25. Divide $p(x) = 3x^3 + x^2 + 2x + 5$ by $g(x) = x^2 + 2x + 1$ and find the quotient $[\,q(x)\,]$ and remainder $[\,r(x)\,]$.

OR

Find the zeroes of the quadratic polynomial $p(x) = x^2 + 7x + 10$, and verify the relationship between zeroes and the coefficients.

26. Prove that

$$\sqrt{\frac{1 + \cos A}{1 - \cos A}} = \operatorname{cosec} A + \cot A$$

OR

Prove that

$$\frac{\sin A}{1 + \cos A} + \frac{1 + \cos A}{\sin A} = 2 \operatorname{cosec} A.$$

27. Find the mean for the following data :

Class-interval	Frequency
1 – 5	4
6 – 10	3
11 – 15	2
16 – 20	1
21 – 25	5

OR

[Turn over

Find the mode for the following data :

Class-interval	Frequency
1 – 3	6
3 – 5	9
5 – 7	15
7 – 9	9
9 – 11	1

28. Find the ratio in which the line segment joining the points

A (– 6, 10) and B (3, – 8) is divided by the point (– 4, 6).
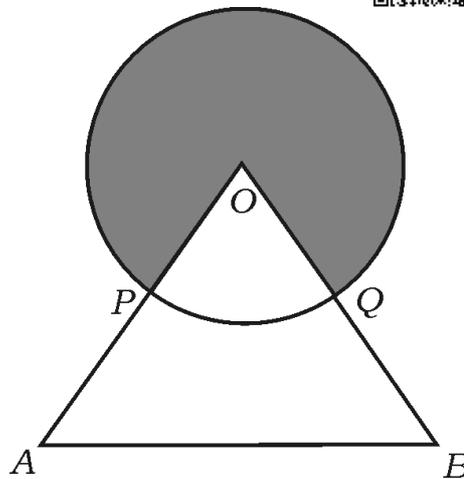
OR

Find the area of a triangle whose vertices are A (1, – 1),

B (– 4, 6) and C (– 3, – 5)

29. Prove that "The lengths of tangents drawn from an external point

to a circle are equal".

30. In the given figure, *'O'* is the centre of a circle and *OAB* is an equilateral triangle. *P* and *Q* are the mid-points of *OA* and *OB* respectively. If the area of Δ *OAB* is $36\sqrt{3}$ cm^2, then find the area of the shaded region.

31. Construct a triangle with sides 5 cm, 6 cm and 8 cm and then construct another triangle whose sides are $\dfrac{3}{4}$ of the corresponding sides of the first triangle.

32. The distance between two cities *'A'* and *'B'* is 132 km. Flyovers are built to avoid the traffic in the intermediate towns between these cities. Because of this, the average speed of a car travelling in this route through flyovers increases by 11 km/h and hence, the car takes 1 hour less time to travel the same distance than earlier. Find the current average speed of the car.

[Turn over

33. A life insurance agent found the following data for distribution of ages of 100 policy holders. Draw a "Less than type ogive" for the given data :

Age (in years)	Number of policy holders (cumulative frequency)
Below 20	2
Below 25	6
Below 30	24
Below 35	45
Below 40	78
Below 45	89
Below 50	100

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

34. The sum of 2nd and 4th terms of an arithmetic progression is 54 and the sum of its first 11 terms is 693. Find the arithmetic progression. Which term of this progression is 132 more than its 54th term ?

OR

The first and the last terms of an arithmetic progression are 3 and 253 respectively. If the 20th term of the progression is 98, then find the arithmetic progression. Also find the sum of the last 10 terms of this progression.

35. Find the solution of the given pair of linear equations by graphical method :
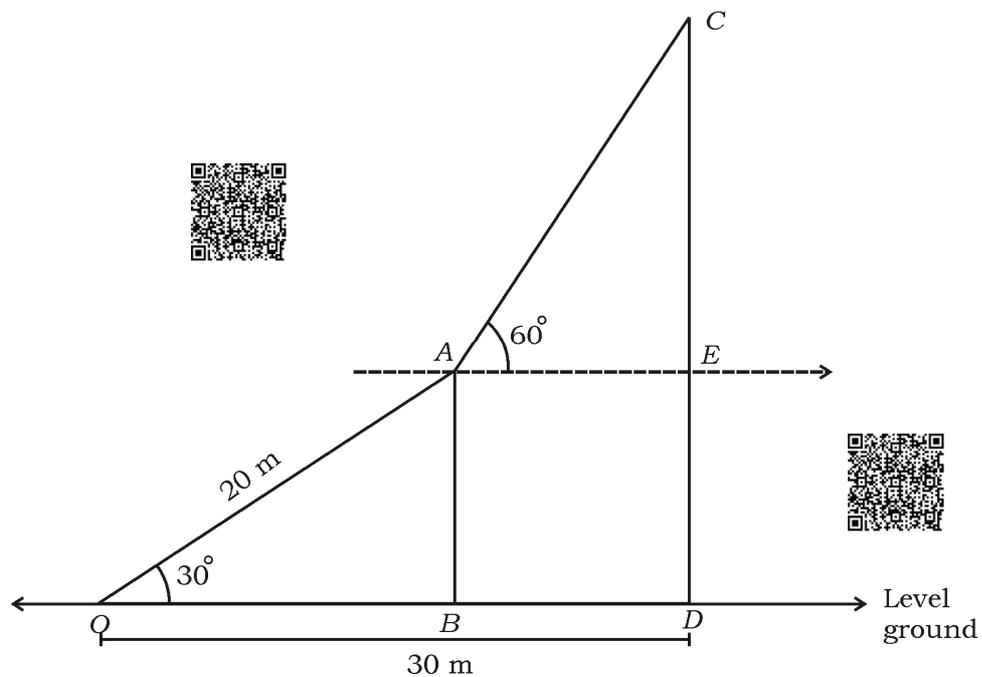
$2x + y = 8$

$x - y = 1$

36. 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".

[Turn over

37. In the given figure, a rope is tightly stretched and tied from the top of a vertical pole to a peg on the same level ground such that the length of the rope is 20 m and the angle made by it with the ground is 30°. A circus artist climbs the rope, reaches the top of the pole and from there he observes that the angle of elevation of the top of another pole on the same ground is found to be 60°. If the distance of the foot of the longer pole from the peg is 30 m, then find the height of this pole. (Take $\sqrt{3}$ = 1·73)

VI. Answer the following question : 1 × 5 = 5

38. A wooden solid toy is made by mounting a cone on the circular base of a hemisphere as shown in the figure. If the area of base of the cone is 38·5 cm^2 and the total height of the toy is 15·5 cm, then find the total surface area and volume of the toy.