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ಮಾರ್ಚ್/ಏಪ್ರಿಲ್ 2024 ರ ಪರೀಕ್ಷೆ – 1
MARCH/APRIL 2024 EXAMINATION-1

Question Paper Serial No.

CCE RF/PF/RR/ PR/NSR/NSPR FULL SYLLABUS

ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 16]

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ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Code No. : 81-E

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಆಂಗ್ಲ ಮಾಧ್ಯಮ / **English Medium**)

(ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / ಶಾಲಾ ಪುನರಾವರ್ತಿತ ಅಭ್ಯರ್ಥಿ / ಖಾಸಗಿ ಪುನರಾವರ್ತಿತ ಅಭ್ಯರ್ಥಿ / ಎನ್.ಎಸ್.ಆರ್. / ಎನ್.ಎಸ್.ಪಿ.ಆರ್.)

(**Regular Fresh / Private Fresh / Regular Repeater / Private Repeater / NSR / NSPR**)

ದಿನಾಂಕ : 02. 04. 2024]   [Date : 02. 04. 2024

ಸಮಯ : ಬೆಳಿಗ್ಗೆ 10-15 ರಿಂದ ಮಧ್ಯಾಹ್ನ 1-30 ರವರೆಗೆ] [Time : 10-15 A.M. to 1-30 P.M.

ಗರಿಷ್ಠ ಅಂಕಗಳು : 80]   [Max. Marks : 80

02. 04. 2024

TEAR HERE TO OPEN THE QUESTION PAPER

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General Instructions to the Candidate :

1. This question paper consists of 38 questions in all.

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 *(Follow the arrow)*. **Do not cut the left side to open the paper.** Check whether all the pages of the question paper are intact.

3. Follow the instructions given against the 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.

6. Ensure that the Version of the question paper distributed to you and the Version printed on your admission ticket is the same.

Tear here

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 product of HCF and LCM of two numbers 15 and 20 is

   (A)   15   (B)   20

   (C)   300   (D)   35

2. If α and β are the zeroes of the quadratic polynomial

   $p(x) = ax^2 + bx + c$, then $\alpha\beta$ is

   (A) $\dfrac{b}{a}$ (B) $\dfrac{-b}{a}$

   (C) $\dfrac{-c}{a}$ (D) $\dfrac{c}{a}$

3. If $\sin \theta = \dfrac{4}{5}$, then the value of $\sqrt{1 - \cos^2 \theta}$ is

   (A) $\dfrac{16}{25}$

   (B) $\dfrac{4}{5}$

   (C) $\dfrac{5}{4}$

   (D) $\dfrac{9}{25}$

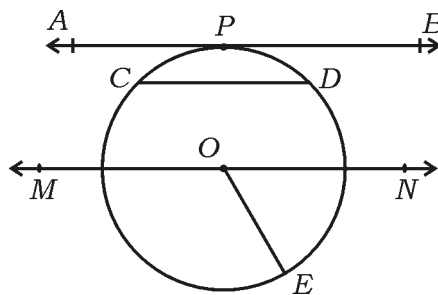4. The probability of a sure event is

   (A) 1

   (B) 0

   (C) – 1

   (D) 1·5

5. The secant of the circle in the figure, is

   (A) *MN*

   (B) *OE*

   (C) *CD*

   (D) *AB*

6. The volume of the frustum of a cone whose base radii are r_1 and r_2 and height 'h', is

(A) $\frac{1}{3} \pi \left(r_1 + r_2 + r_1 \cdot r_2 \right) h$

(B) $\frac{1}{3} \pi \left(r_1^2 + r_2^2 - r_1 \cdot r_2 \right) h$

(C) $\frac{1}{3} \pi \left(r_1^2 + r_2^2 + r_1 \cdot r_2 \right) h$

(D) $\frac{1}{3} \pi \left(r_1^2 - r_2^2 - r_1 \cdot r_2 \right) h$

7. If 2, x, 26 are in Arithmetic progression, then the value of x is

(A) 12   (B) 14

(C) 28   (D) 24

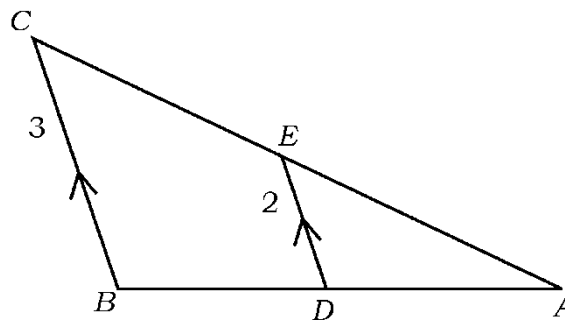8. If $\tan \left(90° - \theta \right) = \sqrt{3}$, then the value of $\cot \theta$ is

(A) $\frac{1}{\sqrt{3}}$ (B) 1

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

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

9. In the figure, $\Delta\ ADE \sim \Delta\ ABC$ and $DE : BC = 2 : 3$. Find $\dfrac{\text{Area of } \Delta\ ADE}{\text{Area of } \Delta\ ABC}$.

10. The radii of the base and the height of a cylinder and a cone are same. If the volume of the cylinder is 27 cubic units, then find the volume of the cone.

11. If $200 = 2^{m} \times 5^{n}$, then find the values of m and n.

12. Find the number of solutions of the pair of linear equations $2x - 3y + 4 = 0$ and $3x + 5y + 8 = 0$.

13. In an Arithmetic progression, sum of the first six terms and sum of the first five terms are 78 and 55 respectively. Then find the sixth term of the progression.
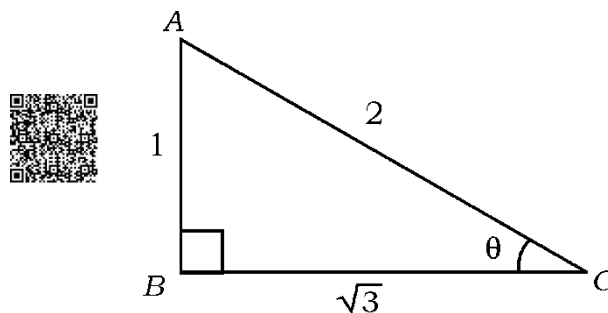
14. Write the degree of the polynomial $p(x) = x(x^2 + 3) + 5x^2 + 7$.

15. If the value of discriminant of a quadratic equation is zero, then write the nature of roots of the quadratic equation.

16. Find the value of θ in the figure.

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

17. Prove that $3 + \sqrt{2}$ is an irrational number.

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

    $2x + y = 8$

    $3x - y = 7$

19. Find the sum of first 20 terms of the Arithmetic progression

    1, 5, 9, ... using formula.

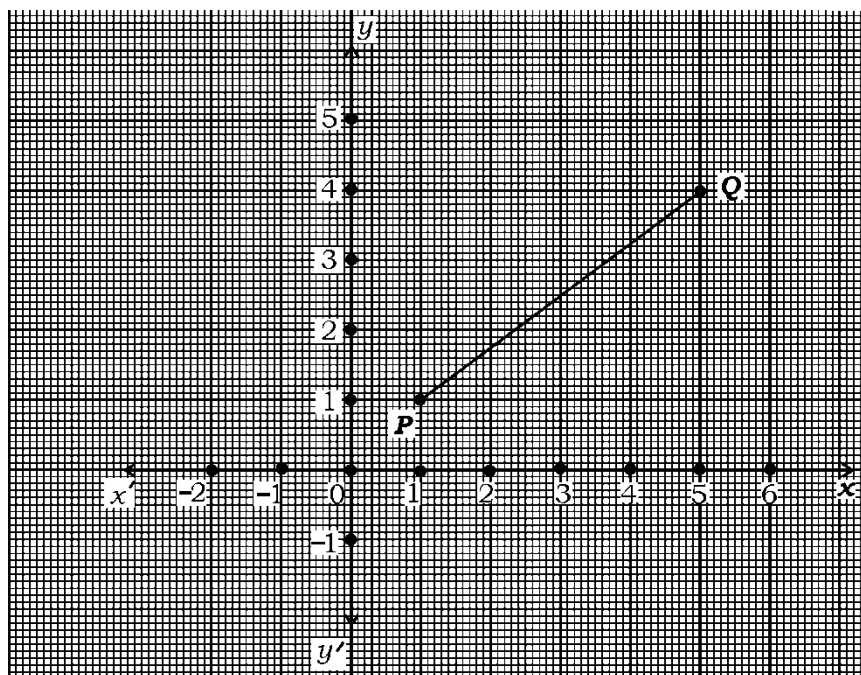20. Find the roots of the quadratic equation $2x^2 - 3x - 1 = 0$ using

    quadratic formula.

21. Prove that $\dfrac{\cos\theta - \sin\theta \,.\, \cos\theta}{\cos\theta + \sin\theta \,.\, \cos\theta} = \dfrac{\operatorname{cosec}\theta - 1}{\operatorname{cosec}\theta + 1}$.

    OR

    Prove that $\dfrac{\sin 30° + \cos 60°}{\operatorname{cosec} 30° - \cot 45°} = \sin 90°$.

22. Find the coordinates of the point *P* and *Q* in the given graph and hence find the length of *PQ* using distance formula.

OR

Find the coordinates of the point which divides the line segment joining the points (4, – 3) and (8, 5) in the ratio 3 : 1 internally.

23. A basket contains 36 mangoes. $\frac{1}{4}$th of them are rotten and others are good. If one mango is drawn at random from the basket, then find the probability of getting a good mango.

24. Draw a circle of radius 3·5 cm and construct a pair of tangents to the circle such that the angle between the tangents is 60°.

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

25. Divide $p(x) = x^3 + 3x^2 + 4x + 5$ by $g(x) = x^2 - x + 1$ and find

the quotient $[q(x)]$ and remainder $[r(x)]$.

OR

When the polynomial $p(x) = x^3 + 4x^2 + 5x - 2$ is divided by the

polynomial $g(x)$, the quotient $[q(x)]$ and remainder $[r(x)]$

are $x^2 - x + 2$ and 4 respectively. Find $g(x)$.

26. Find the mean for the following data :

Class-interval	Frequency
2 – 6	2
7 – 11	4
12 – 16	5
17 – 21	3
22 – 26	1

OR

Find the mode for the following data :

Class-interval	Frequency
1 – 5	1
5 – 9	3
9 – 13	7
13 – 17	10
17 – 21	9

27. 'D' is a point on the side BC of a Δ ABC such that $\lfloor ADC = \lfloor BAC$. Then prove that $AC^2 = BC . CD$.
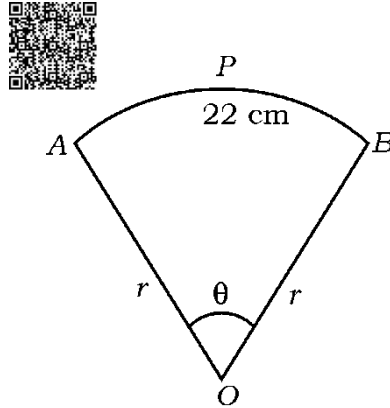
OR

In the figure, Δ ABC and Δ AMP are right angled triangles, right angled at B and M respectively. Then prove that $\dfrac{CA}{PA} = \dfrac{BC}{MP}$.
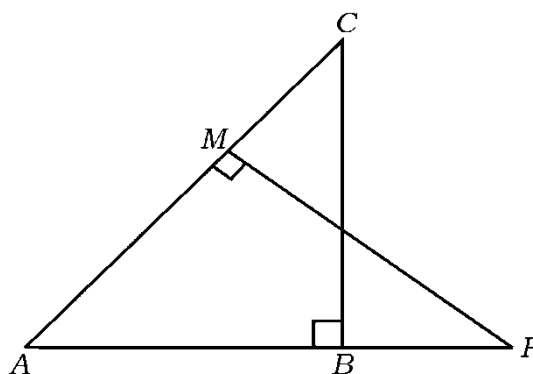

28. Prove that "The lengths of tangents drawn from an external point to a circle are equal".

29. In the figure area of sector *AOBPA* of radius '*r*' is 231 cm^2 and the length of the arc *APB* is 22 cm. Find the radius of the sector and angle θ.

OR

In the figure a rectangle *ROQP* is inscribed in the quadrant of a circle. If the length and breadth of the rectangle are 16 cm and 12 cm respectively, find the area of the shaded region.
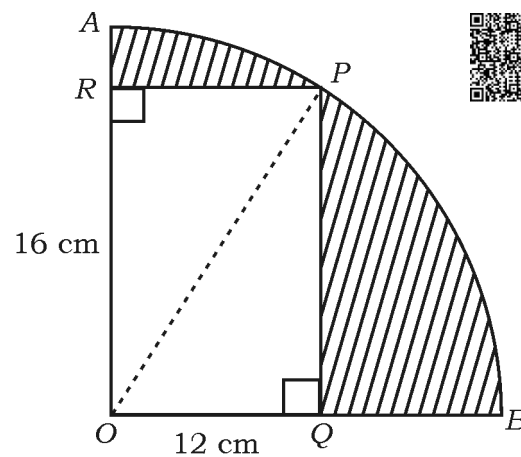
30. Age of mother is twice the square of age of her son. After 8 years mother's age becomes 4 years more than the thrice of age of her son. Find their present ages.

31. In the figure, *ABC* is a triangle whose vertices are *A* (*x*, 10), *B* (2, 2) and *C* (12, 2). If *Q* (9, 6) is the mid-point of *AC* and area of Δ *APQ* is 12 cm^2, then find the area of quadrilateral *PBCQ*.

A (*x*, 10)

Q (9, 6)

P

C (12, 2)

B (2, 2)
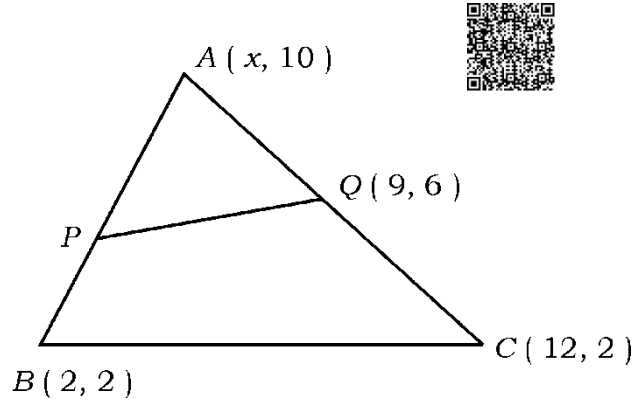
32. The ages of 100 patients admitted in a hospital are as follows. Draw a "less than type ogive" for the given data :

Age (in years)	Number of patients (cumulative frequency)
Less than 10	6
Less than 20	15
Less than 30	38
Less than 40	46
Less than 50	65
Less than 60	84
Less than 70	100

33. Construct a triangle with sides 6 cm, 8 cm and 9 cm and then construct another triangle whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.

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

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

$$2x + y = 8$$

$$x + y = 5$$

35. In an Arithmetic progression the sum of first n terms is 210 and the sum of first $(n - 1)$ terms is 171. If the first term of the Arithmetic progression is 3, then find the Arithmetic progression and find its 20th term.

OR

The sum of interior angles of a polygon of *'n'* sides is $(n-2) 180°$. If the interior angles of a pentagon are in Arithmetic progression and its least angle is 72°, then find all the interior angles of the pentagon.

36. In the figure the poles *AB* and *CD* of different heights are standing vertically on a level ground. From a point *P* on the line joining the foots of the poles on the level ground, the angles of elevation to the tops of the poles are found to be complementary. The height of *CD* and the distance *PD* are $20\sqrt{3}$ m and 20 m respectively. If *BP* is 10 m, then find the length of the pole *AB* and the distance AC between the tops of the poles.
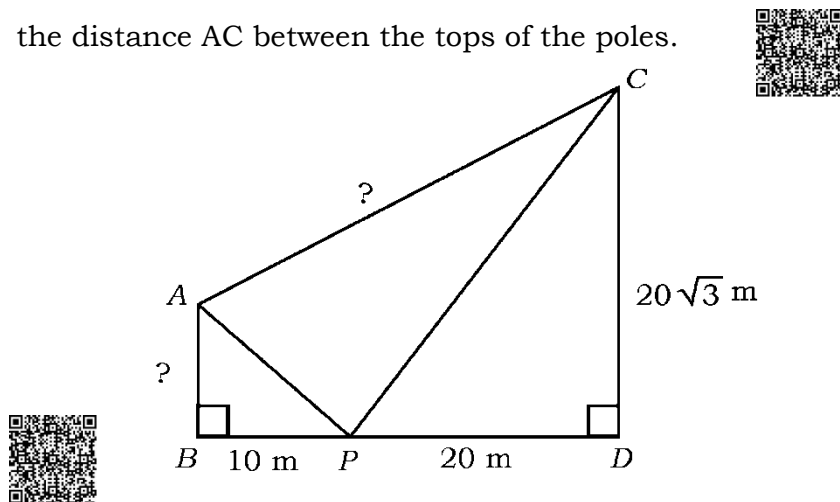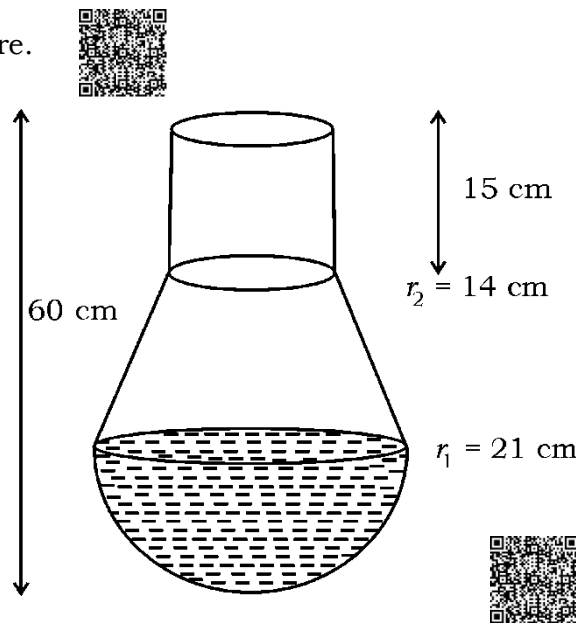

37. Prove : "Basic proportionality theorem" or "Thales theorem".

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

38. An insect control device made of a cylinder, a frustum of a cone and a hemisphere attached to each other is as shown in the figure. Sticky liquid is completely filled in the hemispherical part.

   If the radii of hemisphere and cylinder are 21 cm and 14 cm respectively and total height of the device is 60 cm and height of the cylinder is 15 cm, then calculate the curved surface area of the device and also find the quantity of the sticky liquid in the hemisphere.