

CCE RR/PR/NSR/NSPR(B)/777/3029

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

Question Paper Serial No.

ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 16]

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ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 38]

Total No. of Questions : 38]

**CCE RR/PR/
NSR/NSPR
Reduced Syllabus**

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Code No. : **81-E**

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಆಂಗ್ಲ ಮಾಧ್ಯಮ / English Medium)

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

(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

General Instructions to the Candidate :

Cut here / ಇಲ್ಲಿ ಕತ್ತರಿಸಿ

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.

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ಇಲ್ಲಿಂದ ಕತ್ತರಿಸಿ

TEAR HERE TO OPEN THE QUESTION PAPER

ಇಲ್ಲಿಂದ ಕತ್ತರಿಸಿ

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. $8 \times 1 = 8$**

1. $x(x + 2) = 0$ is



- (A) a linear equation (B) a cubic equation
(C) a quadratic equation (D) not an equation

2. The distance of $P(-5, 0)$ from the origin is

- (A) 2.5 units (B) 0 unit
(C) -5 units (D) 5 units

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

- (A) $\frac{16}{25}$ (B) $\frac{4}{5}$
(C) $\frac{5}{4}$ (D) $\frac{9}{25}$



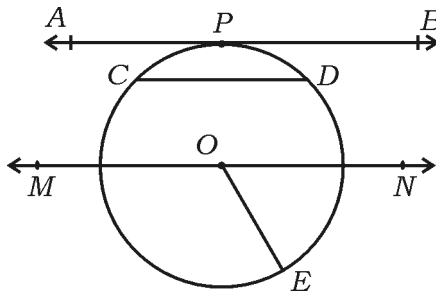
4. The empirical relationship among the three measures of central

tendency is



- (A) $3 \text{ Median} = \text{Mode} + 2 \text{ Mean}$
- (B) $\text{Median} = 3 \text{ Mode} + 3 \text{ Mean}$
- (C) $2 \text{ Mean} = \text{Mode} + 3 \text{ Median}$
- (D) $\text{Mode} = 3 \text{ Median} + 2 \text{ Mean}$

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

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

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

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

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 $\tan (90^\circ - \theta) = \sqrt{3}$, then the value of $\cot \theta$ is

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

(B) 1

(C) 0

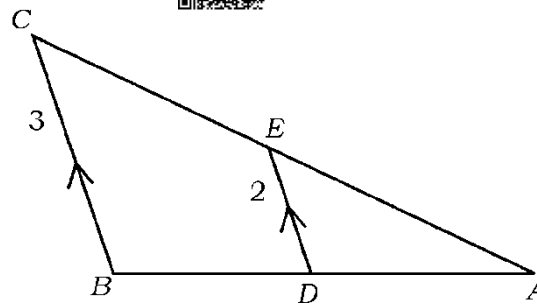
(D) $\sqrt{3}$



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

9. In the figure, $\Delta ADE \sim \Delta ABC$ and $DE : BC = 2 : 3$. Find

$$\frac{\text{Area of } \Delta ADE}{\text{Area of } \Delta ABC} .$$



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 $P(x, 4)$ is at a distance of 5 units from the origin, then find the value of 'x'.

12. Find the number of solutions of the pair of linear equations

$$2x - 3y + 4 = 0 \text{ and } 3x + 5y + 8 = 0.$$



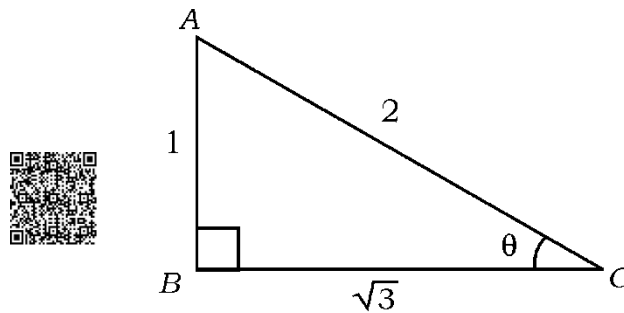
13. In an Arithmetic progression, sum of the first six terms and sum of the first five terms are 78 and 55 respectively. Then find the sixth term of the progression.



14. Write the number of roots of the equation $x = \frac{36}{x}$.

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

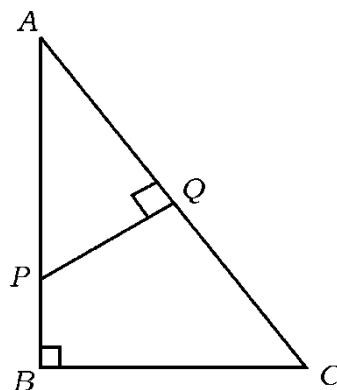
16. Find the value of θ in the figure.



III. Answer the following questions :

8 × 2 = 16

17. In the figure, write the ratio of the corresponding sides of ΔAQP and ΔABC .



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.



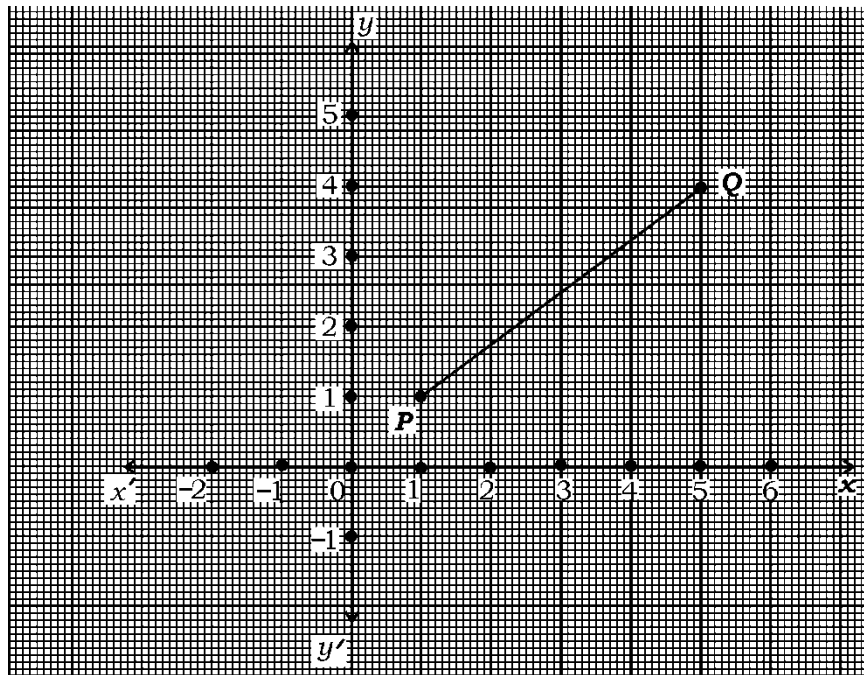
21. Prove that $\frac{\cos \theta - \sin \theta \cdot \cos \theta}{\cos \theta + \sin \theta \cdot \cos \theta} = \frac{\operatorname{cosec} \theta - 1}{\operatorname{cosec} \theta + 1}$.

OR

Prove that $\frac{\sin 30^\circ + \cos 60^\circ}{\operatorname{cosec} 30^\circ - \cot 45^\circ} = \sin 90^\circ$.



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. Prove that $\cot \theta = \sqrt{1 - \sin^2 \theta} \cdot \operatorname{cosec} \theta$.



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 : $9 \times 3 = 27$

25. A fraction becomes $\frac{1}{3}$ when 1 is subtracted from the numerator and it becomes $\frac{1}{4}$ when 8 is added to its denominator. Find the fraction.



OR

2 women and 5 men can together finish an embroidery work in 4 days, while 3 women and 6 men can finish it in 3 days. Find the number of days taken by 1 woman alone to finish the work, and also the number of days taken by 1 man alone.

26. Find the mean for the following data :



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



OR



Find the mode for the following data :



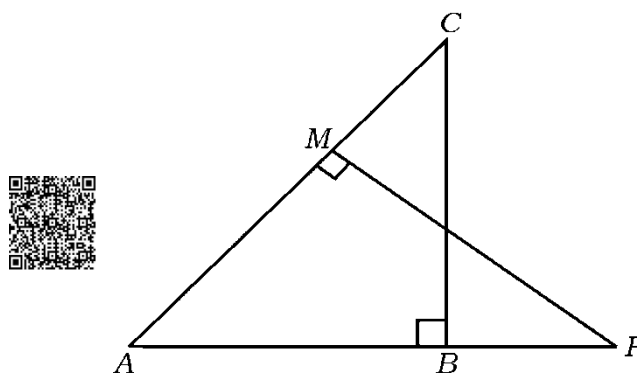
<i>Class-interval</i>	<i>Frequency</i>
1 - 5	1
5 - 9	3
9 - 13	7
13 - 17	10
17 - 21	9

27. 'D' is a point on the side BC of a ΔABC such that $\angle ADC = \angle BAC$. Then prove that $AC^2 = BC \cdot CD$.



OR

In the figure, ΔABC and ΔAMP are right angled triangles, right angled at B and M respectively. Then prove that $\frac{CA}{PA} = \frac{BC}{MP}$.



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

29. A cone of height 24 cm and radius of base 6 cm is reshaped in the form of a sphere. Find the radius of the sphere and also calculate its surface area.



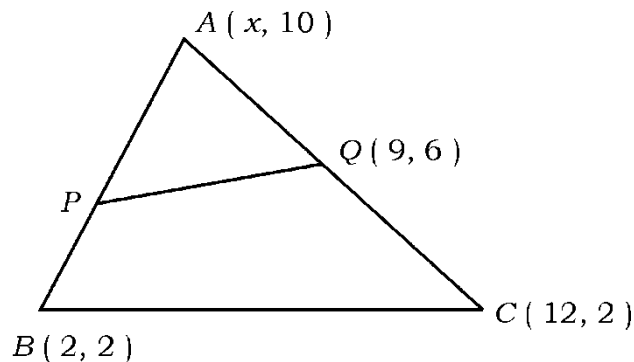
OR

A cylinder of height 32 cm and radius of base 18 cm is converted into a cone of height 24 cm. Find the radius and slant height of the cone.

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 $\triangle APQ$ is 12 cm^2 , then find the area of quadrilateral $PBCQ$.



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 20^{th} term.



OR

- The sum of interior angles of a polygon of ' n ' sides is $(n - 2) 180^\circ$. 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



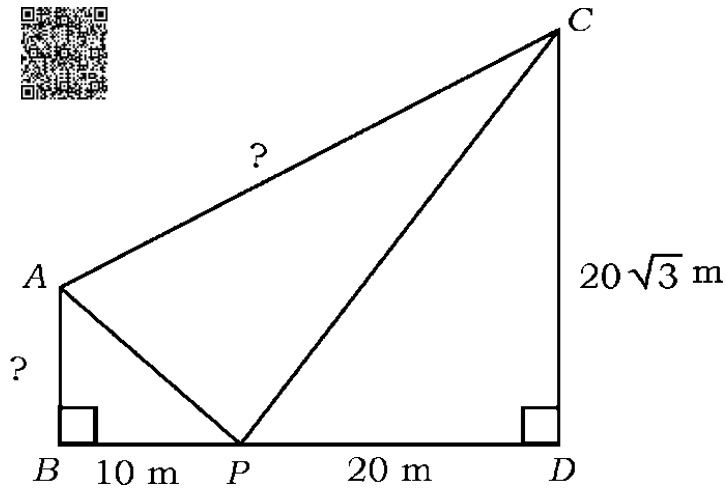
joining the foots of the poles on the level ground, the angles of

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

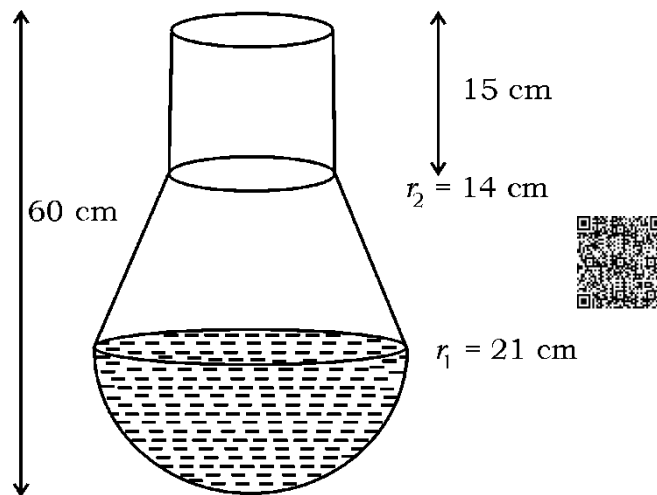
38. An insect control device made of a cylinder, a frustum of a cone and a hemisphere attached to each other is as shown in the



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.



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