CCE-II-RR/PR/PF/NSR/NSPR(A)/888/4020

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ಜೂನ್ 2024 ರ ಪರೀಕ್ಷೆ - 2

JUNE 2024 EXAMINATION - 2

ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 16]

Total No. of Printed Pages : 16]

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 38]

Total No. of Questions : 38]

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

Question Paper Serial No.

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Code No. : 81-E

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಆಂಗ್ಲ ಮಾಧ್ಯಮ / English Medium)

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

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

ದಿನಾಂಕ : 18. 06. 2024] [Date : 18. 06. 2024

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

ಗರಿಷ್ಠ ಅಂಕಗಳು : 80] [Max. Marks : 80

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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.

ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯ ಸರಣಿ ಸಂಖ್ಯೆ

TEAR HERE TO OPEN THE QUESTION PAPER

ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ತೆರೆಯಲು ಇಲ್ಲಿ ಕತ್ತರಿಸಿ

18. 06. 2024

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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. If *'A'* and *'B'* are any two positive integers, *'H'* and *'L'* are HCF and LCM of these integers respectively, then the correct relationship in the following is

   (A) $H \times B = L \times B$

   (B) $H \times L = A \times B$

   (C) $H + L = A + B$

   (D) $H - L = A - B$.

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

   (A) 0 (B) 12

   (C) 16 (D) 48

3. $\frac{\sin(90^\circ - \theta)}{\cos(90^\circ - \theta)}$ is equal to

   (A) $\sin\theta$ (B) $\cos\theta$

   (C) $\tan\theta$ (D) $\cot\theta$

4. The distance of the point M (4, 3) from the origin is

(A) 5 units (B) 7 units

(C) $\sqrt{5}$ units (D) $\sqrt{7}$ units

5. If a fair die is rolled twice, then the number of all the possible outcomes is

(A) 12 (B) 24

(C) 36 (D) 6

6. If the diameter of a circle is 14 cm, then its circumference is

(A) 28 cm (B) 44 cm

(C) 56 cm (D) 88 cm

7. The volume of a cube of edge 5 cm is

(A) $15\ cm^3$ (B) $30\ cm^3$

(C) $100\ cm^3$ (D) $125\ cm^3$

8. An arithmetic progression contains 20 terms. If the first term is 2 and last term is 78, then the arithmetic progression is

(A) 2, 5, 8, ... (B) 2, 7, 12, ...

(C) 2, 6, 10, ... (D) 2, 4, 6, ...

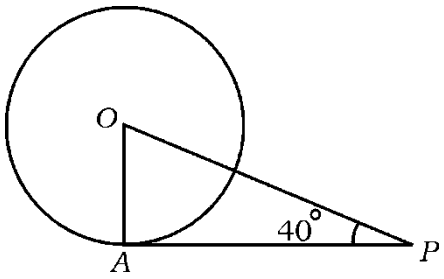
II. <u>Answer the following questions :</u> **8 × 1 = 8**

9. Express 70 as a product of its prime factors.

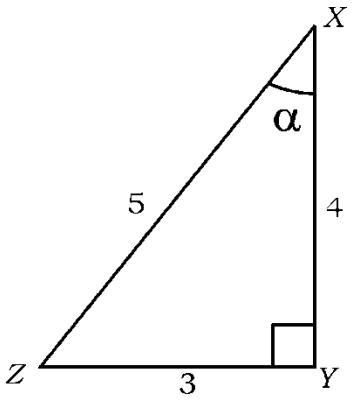
10. If the lines representing the pair of linear equations are intersecting lines, then how many solutions do they have ?

11. Write the zeroes of the polynomial $p(x) = x^2 - 25$.

12. In the figure *'O'* is the centre of the circle. *OA* is the radius and *AP* is the tangent. If $\angle OPA = 40°$, then find $\angle AOP$.

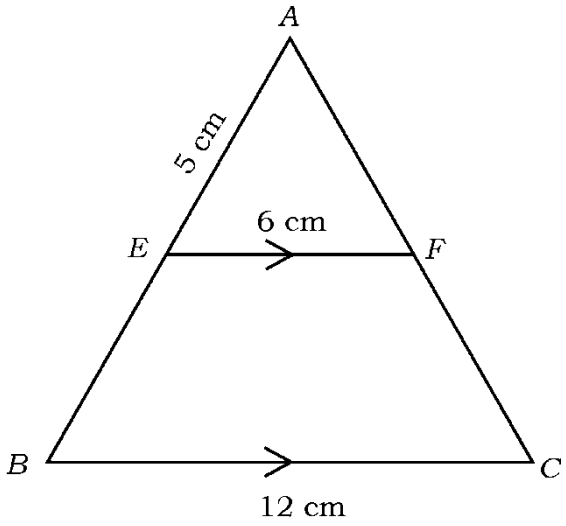


13. In the given figure, if $\angle XYZ = 90°$, then find the value of sin α.



14. Write the formula to find the total surface area of a solid hemisphere of radius *'r'* units.

15. In the given figure, $EF \parallel BC$. If EF = 6 cm, BC = 12 cm and AE = 5 cm, then find AB.



16. Write the degree of the polynomial $p(x) = 5x^2 - 6x^3 - 7x + 1$.

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

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

OR

Without actually performing the long division, find whether the rational number $\frac{7}{200}$ has a terminating decimal expansion or a non-terminating repeating decimal expansion.

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

$2x + y = 8$

$x - y = 1$

19. Find the sum of first 20 terms of the Arithmetic progression 5, 11, 17, ... using formula.

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

OR

Find the roots of the equation $x^2 - 6x + 2 = 0$ by the method of completing the square.

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

22. The area of a triangle with vertices A (0, 2), B (3, 0) and C (x, 3) is $\frac{11}{2}$ sq.units. Find the value of 'x'.

23. Identify the impossible event in the following and write the probability of an impossible event.

Event A : 'getting both head and tail' when a fair coin is tossed once.

Event B : 'getting head or tail' when a fair coin is tossed once.

24. Draw a circle of radius 4 cm and construct a pair of tangents to the circle such that the angle between them is 50°.

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

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

OR

Find a quadratic polynomial whose sum of the zeroes is 7 and product of the zeroes is 12. Also find the zeroes of the polynomial.

26. The sum of the squares of two positive integers is 400. If twice of one integer is 8 more than the other integer, then find the integers.

27. Prove that $\frac{\sec\theta + \tan\theta - 1}{\tan\theta - \sec\theta + 1} = \frac{1 + \sin\theta}{\cos\theta}$

OR

Evaluate : $\left(\frac{5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ}{\sin 30^\circ + \sin 90^\circ} \right)$

28. Find the mean for the following data by 'Direct method' :

Class-interval	*Frequency*
10 – 20	4
20 – 30	6
30 – 40	5
40 – 50	4
50 – 60	1

OR

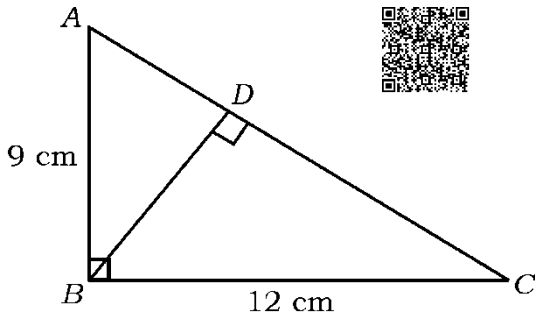
Find the median for the following data :

Class-interval	*Frequency*
50 – 60	5
60 – 70	8
70 – 80	10
80 – 90	4
90 – 100	3

29. The following data gives the monthly consumption of electricity of 100 consumers of a locality. Draw a "less than type ogive" for the given data :

Monthly consumption (in units)	*Number of consumers (cumulative frequency)*
Less than 80	10
Less than 100	25
Less than 120	50
Less than 140	70
Less than 160	75
Less than 180	80
Less than 200	100

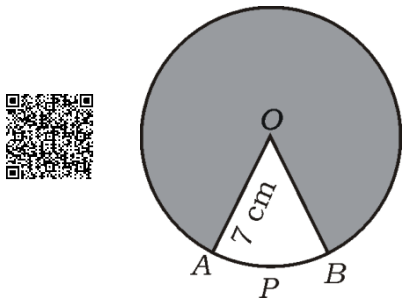
30. In the given figure, $\angle ABC = 90°$ and $BD \perp AC$. Prove that $\Delta ABD \sim \Delta BCD$. If $AB = 9$ cm and $BC = 12$ cm, then find AD.



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

32. Construct a triangle with sides 6·5 cm, 7·5 cm and 8 cm and then construct another triangle whose sides are $\frac{3}{5}$ of the corresponding sides of the first triangle.

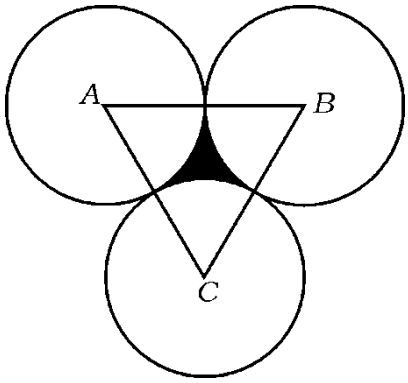
33. In the given figure *'O'* is the centre of the circle of radius 7 cm. If the length of the arc *APB* is $\frac{22}{3}$ cm, then find the area of the shaded region. [Take $\pi = \frac{22}{7}$]



OR

ABC is an equilateral triangle whose vertices are the centres of three touching circles as shown in the figure. If the area of Δ *ABC* is $100\sqrt{3}$ cm^2 and the radius of each circle is half the side of the triangle, then find the area of the shaded region.

[Use $\pi = 3{\cdot}14$ and $\sqrt{3} = 1{\cdot}73$]



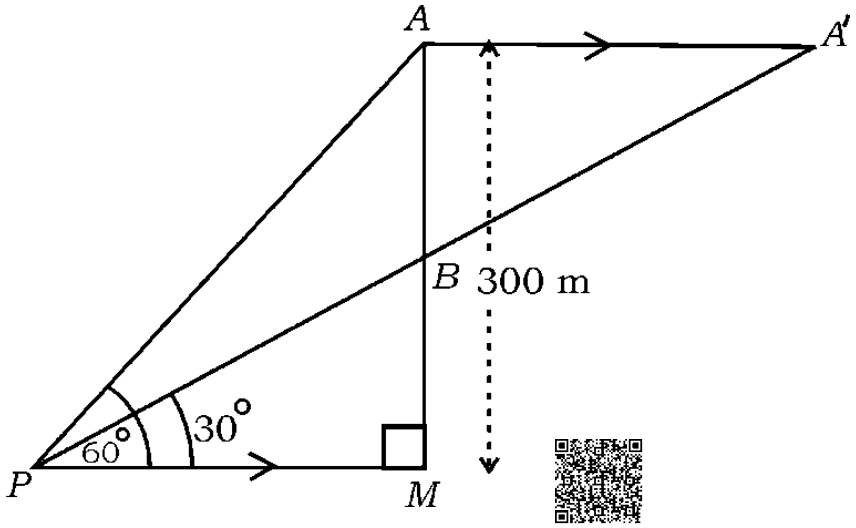
V. Answer the following questions : **4 × 4 = 16**

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

$x + 2y = 6$

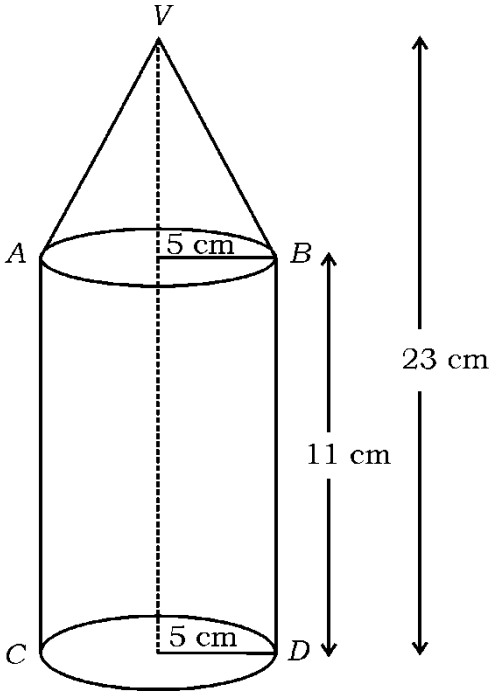
$x + y = 4$

35. Two kites *'A'* and *'B'* are flying one below the other above the horizontal ground as shown in the figure. Kite *'A'* is flying 300 m above the ground. The angles of elevation of kites *'A'* and *'B'* as observed from a point *'P'* on the ground are 60° and 30° respectively. Find the distance between the two kites (AB). After some time when the thread of kite *'A'* is released, it moves horizontal to the ground and reaches the point *'A^{l}'* in the sky. If P, B, A^{l} are in the same line, then find the distance between the kites ($A^{l}B$).



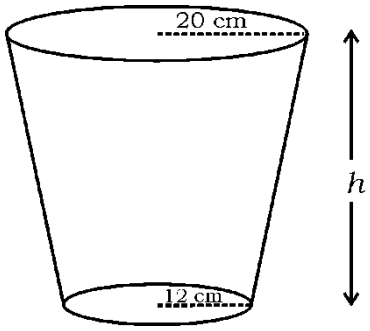
36. Prove that "The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides".

37. A solid is in the shape of a cone placed on the cylinder as shown in the figure. The radii of both the cylinder and the cone are equal to 5 cm. If the height of the cylinder is 11 cm and the total height of the solid is 23 cm, then find the curved surface area and volume of the solid. [Take $\pi = \frac{22}{7}$]



OR

A container is in the form of a frustum of a cone as shown in the figure. The radii of its circular bases are 20 cm and 12 cm. If the volume of the frustum of a cone is 12320 cm^3, then find its curved surface area. [Take $\pi = \frac{22}{7}$]



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

38. An Arithmetic progression contains 30 terms. The 17^{th} term of the progression is 4 more than thrice its fifth term. If the 10^{th} term is 31, then find the last three terms of the progression and also find the arithmetic progression.