

Tsi9M

Tenkasi District
Common Half Yearly Examination - 2023



03-01-2024

Standard 9

Time: 3.00 Hours

MATHS

Marks: 100

Part - A

Answer all the questions. Choose the best answer:

14x1=14

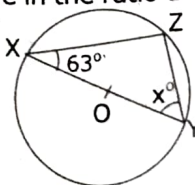
- 1) The set $P = \{x / x \in \mathbb{Z}, -1 < x < 1\}$ is a
 - a) Singleton set
 - b) Power set
 - c) Null set
 - d) Subset
- 2) If $A = \{x, y, z\}$ then the number of non - empty subsets of A is
 - a) 8
 - b) 5
 - c) 6
 - d) 7
- 3) Which of the following is true?
 - a) $A - B = A \cap B$
 - b) $A - B = B - A$
 - c) $(A \cup B)' = A' \cup B'$
 - d) $(A \cap B)' = A' \cup B'$
- 4) An irrational number between 2 and 2.5 is
 - a) $\sqrt{11}$
 - b) $\sqrt{5}$
 - c) $\sqrt{2.5}$
 - d) $\sqrt{8}$
- 5) $0.\overline{34} + 0.\overline{34} =$
 - a) $0.\overline{687}$
 - b) $0.\overline{68}$
 - c) $0.\overline{68}$
 - d) $0.\overline{687}$
- 6) If $x^{51} + 51$ is divided by $x + 1$, then the remainder is
 - a) 0
 - b) 1
 - c) 49
 - d) 50
- 7) $(x + y)(x^2 - xy + y^2)$ is equal to
 - a) $(x + y)^3$
 - b) $(x - y)^3$
 - c) $x^3 + y^3$
 - d) $x^3 - y^3$
- 8) If (2, 3) is a solution of linear equation $2x + 3y = k$ then value of k is
 - a) 12
 - b) 6
 - c) 0
 - d) 13
- 9) The interior angle made by the side in a parallelogram is 90° then the parallelogram is a
 - a) rhombus
 - b) Rectangle
 - c) trapezium
 - d) Kite
- 10) The angles of the triangle are $3x - 40$, $x + 20$ and $2x - 10$ then the value of x is
 - a) 40°
 - b) 35°
 - c) 50°
 - d) 45°
- 11) The point whose ordinate is 4 and which lies on y axis is
 - a) (4, 0)
 - b) (0, 4)
 - c) (1, 4)
 - d) (4, 2)
- 12) The point (-1, -3) lies which quadrant?
 - a) I quadrant
 - b) Second quadrant
 - c) Third quadrant
 - d) Fourth quadrant
- 13) If $\tan \theta = \cot 37^\circ$ then the value of θ is
 - a) 37°
 - b) 53°
 - c) 90°
 - d) 1°
- 14) $2 \sin \theta = \sqrt{3}$ then value of θ is
 - a) 90°
 - b) 30°
 - c) 45°
 - d) 60°

Part - B

Answer any 10 questions. Question Number 28 is compulsory.

10x2=20

- 15) If $n[P(A)] = 256$ find $n(A)$
- 16) If $A = \{2, 6, 10, 14\}$, $B = \{2, 5, 14, 16\}$ find $A - B$ and $B - A$
- 17) Find any three rational numbers between $\frac{-7}{11}$ and $\frac{2}{11}$
- 18) Represent the following number in scientific notation. 2000.57
- 19) Add the polynomials and find the degree of the resultant polynomial.
 $P(x) = 6x^2 - 7x + 2$, $q(x) = 6x^2 - 7x + 15$
- 20) Factorise : $x^2 + 10x + 24$
- 21) Find the GCD of $35x^5y^3z^4$, $49x^2yz^3$ and $14xy^2z^2$
- 22) The angles of a triangle are in the ratio 1 : 2 : 3. Find each angle of the triangle.
- 23) Find the value of x°

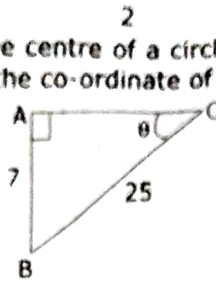


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- 24) The point $(3, -4)$ is the centre of a circle of which AB is a diameter of the circle and B is $(5, -6)$. Find the co-ordinate of A .

25)

Find the trigonometrical ratio $\sin \theta, \cos \theta$



- 26) Find the value of $\sin^2 30^\circ - 2 \cos^2 60^\circ + 3 \tan^4 45^\circ$

27) Find the value : $\frac{\cos 35^\circ}{\sin 55^\circ} + \frac{\sin 12^\circ}{\cos 78^\circ} - \frac{\cos 18^\circ}{\sin 72^\circ}$

- 28) If the centroid of a triangle is at $(4, -2)$ and two of its vertices are $(3, -2)$ and $(5, 2)$ then find the third vertex of the triangle.

Part - C

Answer any 10 questions. Question Number 42 is compulsory. $10 \times 5 = 50$

- 29) If $A = \{0, 2, 4, 6, 8\}$, $B = \{x : x \text{ is a prime number and } x < 11\}$ and $C = \{x : x \in \mathbb{N} \text{ and } 5 \leq x < 9\}$ then verify $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

- 30) In a school, all students play either Hockey (or) Cricket or both. 300 play Hockey, 250 play Cricket & 100 play both games. Find

- the number of students who play only Hockey
- the number of students who play only Cricket
- the total number of students in the school

31) Simplify $3\sqrt{75} + 5\sqrt{48} - \sqrt{243}$

- 32) Represent 4.863 on the number line

33) If $x = \sqrt{5} + 2$ find $x^2 + \frac{1}{x^2}$

- 34) If two polynomials $2x^3 + ax^2 + 4x - 12$ and $x^3 + x^2 - 2x + a$ leave the same remainder when divided by $x - 3$. Find the value of a .

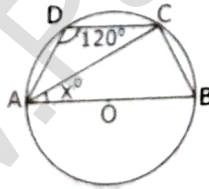
35) Factorise : $x^3 - 10x^2 - x + 10$

- 36) $(4x^3 + 6x^2 - 23x + 18) \div (x + 3)$. Find the Quotient and remainder.

- 37) Find the length of a chord which is at a distance $2\sqrt{11}$ cm from the centre of the circle of radius 12cm.

38)

Find the value of x from the given figure



- 39) Find the points which divide the line segment joining $A(-11, 4)$ and $B(9, 8)$ into four equal parts.

40) If $2 \cos \theta = \sqrt{3}$ then find all the trigonometric ratios of angle θ .

41) Find the value of $\tan 15^\circ \tan 30^\circ \tan 45^\circ \tan 60^\circ \tan 75^\circ$.

- 42) Show that points $A(1, 1)$, $B(2, 1)$, $C(2, 2)$, $D(1, 2)$ form a rhombus.

Part - D

 $8 \times 2 = 16$

- 43) Draw an equilateral triangle of side 6.5cm and locate its orthocentre. (OR)
Draw a triangle ABC , where $AB = 8$ cm, $BC = 6$ cm and $\angle B = 70^\circ$ and locate the circumcentre and draw the circumcircle.

44) Draw the graph of $y = \left(\frac{3}{2}\right)x + 3$ (OR)

Use graphical method to solve the following system of equations.

$x + y = 5$, $2x - y = 4$
