

COMMON HALF YEARLY EXAMINATION - 2022

Time: 3.00 hrs.

**Standard - IX
MATHS**Reg No.

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Marks: 100

PART - I**14×1=14****I. Choose the correct answer:**

1. The set $P = \{x | x \in \mathbb{Z}, -1 < x < 1\}$ is a

a) Singleton set	b) Power set	c) Null set	d) Sub set
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2. Which of the following is correct?

a) $\emptyset \subset \{a, b\}$	b) $\emptyset \in \{a, b\}$	c) $\{a\} \in \{a, b\}$	d) $a \subset \{a, b\}$
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3. If n is a natural number then \sqrt{n} is

a) always a natural number	b) always an irrational number
c) always a rational number	d) May be rational or irrational
4. If $\frac{1}{7} = 0.\overline{142857}$ then the value of $\frac{5}{7}$ is

a) $0.\overline{142857}$	b) $0.\overline{714285}$	c) $0.\overline{571428}$	d) 0.714285
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5. $4\sqrt{7} \times 2\sqrt{3} =$

a) $6\sqrt{10}$	b) $8\sqrt{21}$	c) $8\sqrt{10}$	d) $6\sqrt{21}$
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6. The root of the polynomial equation $2x + 3 = 0$ is

a) $\frac{1}{3}$	b) $-\frac{1}{3}$	c) $-\frac{3}{2}$	d) $-\frac{2}{3}$
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7. If $x - 3$ is a factor of $p(x)$, then the remainder is

a) 3	b) -3	c) $p(3)$	d) $p(-3)$
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8. GCD of any two prime number is _____.

a) -1	b) 0	c) 1	d) 2
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9. The exterior angle of a triangle is equal to the sum of two

a) Exterior angles	b) Interior Opposite angles	c) Alternate angles	d) Interior angles
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10. 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
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11. PQ and RS are two equal chords of a circle with centre O such that $\angle POQ = 70^\circ$ then $\angle ORS =$

a) 60°	b) 70°	c) 55°	d) 80°
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12. The point $(-5, 2)$ and $(2, -5)$ lie in the _____.

a) same quadrant	b) II and III quadrant respectively
c) II and IV quadrant respectively	d) IV and II quadrant respectively
13. The point whose ordinate is 4 and which lie on the y-axis is _____.

a) $(4, 0)$	b) $(0, 4)$	c) $(1, 4)$	d) $(4, 2)$
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14. The ratio in which the x - axis divides the line segment joining the points $A(a_1, b_1)$ and $B(a_2, b_2)$ is

a) $b_1 : b_2$	b) $-b_1 : b_2$	c) $a_1 : a_2$	d) $-a_1 : a_2$
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PART - II**Note : Answer any 10 questions. Question No.28 is compulsory: $10 \times 2 = 20$**

15. Write down the power set of $A = \{a, b\}$
16. If $K = \{a, b, d, e, f\}$, $L = \{b, c, d, g\}$ and $M = \{a, b, c, d, h\}$ then find $K \cup (L \cap M)$
17. If $n(A) = 25$, $n(B) = 40$, $n(A \cup B) = 50$ and $n(B') = 25$. find $n(A \cap B)$ and $n(U)$.
18. Find any two rational numbers between $-\frac{7}{11}$ and $\frac{2}{11}$

13. Express $\frac{1}{x}$ in the form of $\frac{1}{a} + \frac{1}{b}$
14. Express $x^2 - 4x + 4$ as a perfect square.
15. What would be the value of $x^2 + 2x + 3$ if $x = 2$?
16. Factorise: $x^2 + 12x + 36$
17. Find DCF of $12x^2 - 20x + 8$.
18. The diameter of the circle is 10cm and the length of one of its chords is 8cm. Then the distance of the chord from the centre
19. Find the value of x^2 in the figure when $x = 3\pi$.

20. Find the distance between the points (4, 3), (5, 7)
21. Find the distance of the triangle whose vertices are (2, 4), (2, 7) and (5, 7).
22. Find the mid-points of the line segment joining the points (-2, 3) and (6, 5).

Note : Answer any 10 questions. Question No. 42 is compulsory. 20x8=80

23. If $x = (1, 2, 3, 4, 5, 6, 7, 8, 9)$ and $y = (3, 4, 5, 7)$ find
 $(x - y)^2$ and $x^2 - y^2$
24. Earth A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z have 200 students
25. In a group of 120 students, 65 students speak Tamil, 42 students speak French, 21 students speak French, 12 speak Tamil and English, 17 speak English and French and 11 speak Tamil and French. If each student speaks atleast one of these languages. Then find the number of students who speak all three languages.
26. Arrange in ascending order 12, 14, 10
27. If $x = \sqrt{5} - 1$, then find the value of $x^2 - \frac{1}{x^2}$
28. Solve: $4x + 2y = 62$ and $x + 2y = 25$
29. Prove that in a parallelogram, opposite sides are equal.
30. The angles of quadrilaterals are in the ratio 2 : 4 : 3 : 7. Find all the angles.
31. Find the length of median through A of a triangle whose vertices are A(-1, 3), B(1, -1) and C(3, 1).
32. Show that the points A(-3, 1), B(-6, -7), C(3, -4), D(6, -1) taken in order form the vertices of a parallelogram.
33. Find the co-ordinates of the points of trisection of the line segment joining the points A(-5, 6) and B(4, -3).
34. Represent 5.244 on the number line.
35. Show that the following points A(2, 1), B(6, 4) and C(8, 6) lies on a straight line.
36. Factorise: $x^2 - 2x^2 - 12x + 24$.

PART - IV

Note : Answer the following questions:

20x4=80

43. Construct the LHM such that $OP = 7.5\text{cm}$, $OM = 5\text{cm}$ and $OA = 8\text{cm}$. Locate D centrally. (OR)
 Draw and locate the orthocentre of a right triangle PQR where $PQ = 4.5\text{cm}$, $QR = 6\text{cm}$ and $PR = 7.5\text{cm}$.
44. Draw the graph of $y = \begin{cases} 1 & x < 0 \\ 1 & x \geq 0 \end{cases}$ (OR)
 Solve graphically $x + y = 7$ and $x - y = 3$.