COMMON ANNUAL EXAMINATION – 2024

Standard IX

MATHEMATICS

B

Marks: 110

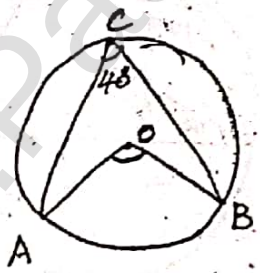
Time: 2.30 hrs.

Part - I

14 x 1 = 14

I. Choose the correct answer.

1. If $A \cup B = A \cap B$, then
   a) $A \neq B$ b) $A = B$ c) $A \subset B$ d) $B \subset A$
2. If $B \subseteq A$ then $n(A \cap B)$ is
   a) $n(A - B)$ b) $n(B)$ c) $n(B - A)$ d) $n(A)$
3. Which One of the following is an irrational number?
   a) $\sqrt{25}$ b) $\sqrt{9/4}$ c) $7/11$ d) π
4. If $\sqrt{80} = k\sqrt{5}$, then k =
   a) 2 b) 4 c) 8 d) 16
5. The zero of the polynomial 2x + 5 is
   a) $\frac{5}{2}$ b) $\frac{-5}{2}$ c) $\frac{2}{5}$ d) $\frac{-2}{5}$
6. Degree of the constant polynomial is _____.
   a) 3 b) 2 c) 1 d) 0
7. In the figure O is the centre of the circle and $\angle ACB = 40^\circ$ then $\angle AOB$ =



   a) 80° b) 85° c) 70° d) 65°
8. The distance between the two points (2,3) and (1,4) is _____.
   a) 2 b) $\sqrt{56}$ c) $\sqrt{10}$ d) $\sqrt{2}$
9. If $\tan\theta = \cot 37^\circ$, then the value of θ is
   a) 37° b) 53° c) 90° d) 1°
10. If the sides of a triangle are 3 cm, 4 cm and 5 cm. Then the area is
    a) 3 cm^2 b) 6 cm^2 c) 9 cm^2 d) 12 cm^2

11. The total surface area of a cuboid with dimensions 10 cm x 6 cm x 5 cm is

a) 280 cm^2 b) 300 cm^2 c) 360 cm^2 d) 600 cm^2

12. The mean of 5, 9, x, 17 and 21 is 13, then find the value of x

a) 9 b) 13 c) 17 d) 21

13. The mean of the first 10 natural numbers

a) 26 b) 5.5 c) 7.5 d) 8

14. Probability lies between

a) –1 and +1 b) 0 and 1 c) 0 and n d) 0 and ∞

Part - II

II. Answer any 10 questions. (Q.No.28 is compulsory) 10 x 2 = 20

15. Write all the subset of A = {a,b}

16. If A = {2,3,5} and B = {3,4,5,6}, find (A ∩ B)

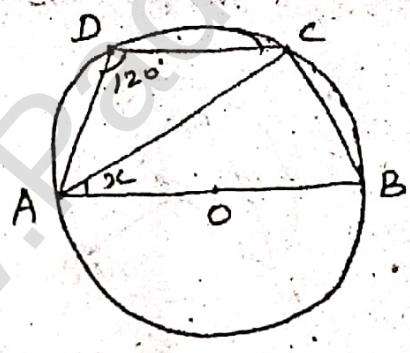
17. Find any three rational numbers between $\frac{-7}{11}$ and $\frac{2}{11}$

18. Verify that $1 = 0.\overline{9}$

19. Find the zeros of the polynomial P(x) = 2x + 5

20 Expand : $(3a - 4b)^3$

21 Find the value of x in the given figure.



22. Find the distance between the points (–4,3), (2,–3)

23. Evaluate : $\frac{\sin 49^\circ}{\cos 41^\circ}$

24. Find the total surface area and lateral surface area of the cube whose side is 5 cm.

25. Find the volume of a cuboid whose dimensions are length = 12 cm, breadth = 8 cm, height = 6 cm

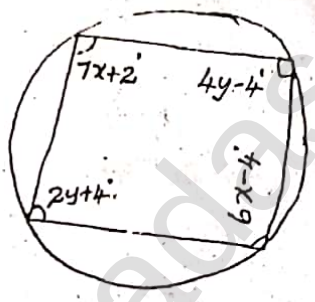
26. In a week temperature of a certain place is measured during winter are as follows : 26°C, 24°C, 28°C, 31°C, 30°C, 26°C, 24°C. Find the mean temperature of the week.

27. Find the mode of the given data : 3.1, 3.2, 3.3, 2.1, 1.3, 3.3, 3.1
28. When a dice is rolled, find the probability to get the number which is greater than 4

Part - III

III. Answer any 10 questions. (Q.No.42 is compulsory) $10 \times 5 = 50$

29. If A = {b, c, e, g, h}, B = {a, c, d, g, i} and C = {a, d, e, g, h}, then show that $A - (B \cap C) = (A - B) \cup (A - C)$
30. Rationalise the denominator of $\frac{5+\sqrt{3}}{5-\sqrt{3}}$
31. Simplify the following using addition and subtraction properties of surds $3\sqrt{75} + 5\sqrt{48} - \sqrt{243}$
32. Determine the value of m ; if (x + 3) is a factor of $x^3 - 3x^2 - mx + 24$
33. Factorise : $25x^2 + 4y^2 + 9z^2 - 20xy + 12yz - 30xz$
34. Solve by elimination method : $x - y = 5$, $3x + 2y = 25$
35. Find all the angles of the given cyclic quadrilateral ABCD in the figure.



36. Show that the following points taken in order form an equilateral triangle $A(\sqrt{3}, 2)$, B(0, 1), C(0, 3)
37. If $3 \cot A = 2$, then find the value of $\frac{4 \sin A - 3 \cos A}{2 \sin A + 3 \cos A}$
38. The lengths of sides of a triangular field are 28 m, 15 m and 41 m. Calculate the area of the field. Find the cost of levelling the field at the rate of ₹20 per m^2.
39. The following are the marks scored by the students in the summative assessment exam.

Class	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	2	7	15	10	11	5

Calculate the median.

40. Two dice are rolled, find the probability that the sum is

i) equal to 1 ii) equal to 4 iii) less than 13

41. There are 24 balls in a pot. If 3 of them are red, 5 of them are blue and the remaining are green then, what is the probability of picking out

i) a blue ball ii) a red ball and iii) a green ball ?

42. Verify $A - (B \cap C) = (A - B) \cup (A - C)$ using Venn diagrams.

Part - IV

IV. Answer the following. **2 x 8 = 16**

43. a) Construct the centroid of ΔPQR whose sides are PQ = 8 cm, QR = 6 cm, RP = 7 cm

(OR)

b) Draw a triangle ABC, where AB = 8 cm, BC = 6 cm and $\angle B = 70^\circ$ and locate its circumcentre and draw the circumcircle.

44. a) Draw the graph of $y = 3x - 1$

(OR)

b) Solve graphically $3x + 2y = 4$, $9x + 6y - 12 = 0$

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