

09-T3-MATHS-TIRUPATTUR

ANNUAL EXAM - 2023

STD - IX

MATHEMATICS

MARKS : 100

TIME : 3.00 Hrs

PART - I Choose the best answer.

14 x 1 = 14

1. For any three sets A, B and C $(A - B) \cap (B - C)$ is equal to
a) A only b) B only c) C only d) ϕ
2. The set $P = \{x \mid x \in \mathbb{Z}, -1 < x < 1\}$ is a
a) singleton set b) Power set c) Null set d) Subset
3. If $\sqrt{80} = K\sqrt{5}$, then $K =$ a) 2 b) 4 c) 8 d) 16
4. $0.\overline{23} + 0.\overline{23} =$ a) $0.\overline{465}$ b) $0.46\overline{56}$ c) $0.4\overline{6}$ d) $0.4\overline{6}$
5. The root of the polynomial equation $2x + 3 = 0$ is a) $\frac{1}{3}$ b) $-\frac{1}{3}$ c) $-\frac{3}{2}$ d) $-\frac{2}{3}$
6. If $x - 3$ is a factor of $p(x)$, then the remainder is a) 3 b) -3 c) $p(3)$ d) $p(-3)$
7. 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
8. If one angle of a cyclic quadrilateral is 80° then the opposite angle is
a) 100° b) 105° c) 80° d) 90°
9. The point whose ordinate is 4 and which lies on the y-axis is
a) (4, 0) b) (0, 4) c) (1, 4) d) (-4, 2)
10. If $(x+2, 4) = (5, y-2)$, then the coordinates (x, y) are
a) (7, 12) b) (6, 3) c) (3, 6) d) (2, 1)
11. If $\tan \theta = \cot 37^\circ$, then the value of θ is a) 37° b) 53° c) 90° d) 1°
12. If the ratio of the sides of two cubes are 2 : 3, then ratio of their surface areas will be
a) 4 : 6 b) 4 : 9 c) 6 : 9 d) 16 : 36
13. The algebraic sum of the deviations of a set of n values from their mean is
a) 0 b) $n - 1$ c) n d) $n + 1$
14. Probability lies between a) -1 and +1 b) 0 and 1 c) 0 and n d) 0 and ∞

PART - II Answer any 10 questions. Q.No. 28 is compulsory.

10 x 2 = 20

15. If $n(A) = 4$, find $n[p(A)]$.
16. If $A = \{6, 7, 8, 9\}$ and $B = \{8, 10, 12\}$, find $A \Delta B$
17. Convert the decimal number $2.\overline{9}$ in the form of $\frac{p}{q}$
18. The mass of the Earth is 5.97×10^{24} kg and that of the Moon is 0.073×10^{24} kg. What is their total mass?
19. Find the GCD of $16x^3y^2$, $24xy^3z$.
20. Find the length of a chord which is at a distance of 15cm from the centre of a circle of radius 25 cm.
21. The point (3, -4) is the centre of a circle. If AB is a diameter of the circle and B is (5, -6), find the coordinates of A.
22. Find the centroid of the triangle whose vertices are A (6, -1), B (8, 3) and C (10, -5).
23. Evaluate : $\sin^2 45^\circ + \cos^2 45^\circ$
24. Find the TSA of a cuboid whose length, breadth and height are 20 cm, 15 cm and 8 cm respectively.
25. Find the volume of a cube whose side is 10 cm.
26. For the following ungrouped data 36, 44, 86, 31, 37, 44, 86, 35, 60, 51. Find the median.

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27. The probability that it will rain tomorrow is $\frac{91}{100}$. What is the probability that it will not rain tomorrow?

28. Show that $(x + 2)$ is a factor of $x^3 - 4x^2 - 2x + 20$.

PART - III Answer any 10 questions. Q.No. 42 is compulsory.

10 x 5 = 50

29. If $A = \{-2, 0, 1, 3, 5\}$, $B = \{-1, 0, 2, 5, 6\}$ and $C = \{-1, 2, 5, 6, 7\}$, then show that $A - (B \cup C) = (A - B) \cap (A - C)$

30. In an examination 80 students passed in Mathematics and 70 students passed in Science while 10 students failed in both subjects. 20 students passed in both the subjects. Find the total number of students who appeared in the examination, if they took examination in only two subjects.

31. Represent $\sqrt{9.3}$ on a number line.

32. Find the value of a and b if $\frac{5+\sqrt{3}}{5-\sqrt{3}} = a+b\sqrt{3}$

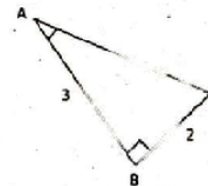
33. The monthly income of A and B are in the ratio 3 : 4 and their monthly expenditures are in the ratio 5 : 7. If each saves ₹ 5000 per month. Find the monthly income of each.

34. The angles of a quadrilateral are in the ratio 2 : 4 : 5 : 7. Find all the angles.

35. Show that the points A(3, -2), B(7, 6), C(-1, 2), D(-5, -6) taken in that order form the vertices of a rhombus.

36. Find the length of median through A of a triangle whose vertices are A(-1, 3), B(1, -1) and C(5, 1).

37. If $\tan A = \frac{2}{3}$ then find all the other trigonometric ratios.



38. The sides of a triangular ground are 22m, 120m and 122m. Find the area and cost of levelling the ground at the rate of ₹ 20 per m^2 .

39. The side of a metallic cube is 12 cm. It is melted and formed into a cuboid whose length and breadth are 18cm and 16cm respectively. Find the height of the cuboid.

40. Factorise : $x^3 + 13x^2 + 32x + 20$ into linear factors.

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 (iii) a Green ball.

42. Find the mean for the following frequency table.

Class interval	100-120	120-140	140-160	160-180	180-200	200-220	220-240
frequency	10	8	4	4	3	1	2

PART - IV Answer all questions

2 x 8 = 16

43. a) Construct the ΔPQR whose sides are $PQ = 8$ cm, $QR = 6$ cm and $RP = 7$ cm and locate its centroid (OR)

b) Construct the ΔABC with $AB = 5$ cm, $\angle B = 100^\circ$ and $BC = 6$ cm. Also locate its circumcentre. Draw circumcircle.

44. a) Draw the graph : $y = 3x - 1$ (OR) b) solve graphically $x + y = 7$: $x - y = 3$