

SRTJ

THIRD REVISION TEST - 2024

10 - STD

MATHS

Marks : 100

TIME: 3.00 Hrs

PART- I (Marks - 14)

Note: i) Answer All the 14 questions. ii) Choose the most suitable answer from given the four alternatives and write the option code with the corresponding answers.

14 x 1 = 14

1. $A = \{a, b, p\}$, $B = \{2, 3\}$, $C = \{p, q, r, s\}$ then; $n[(A \cup C) \times B]$ is
(A) 8 (B) 20 (C) 12 (D) 16
2. Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are
(A) 0, 1, 8 (B) 1, 4, 8 (C) 0, 1, 3 (D) 1, 3, 5
3. The next term of the sequence $\frac{3}{16}, \frac{1}{81}, \frac{1}{21}, \frac{1}{8}, \dots$ is
a) $\frac{1}{24}$ b) $\frac{1}{27}$ c) $\frac{2}{3}$ d) $\frac{1}{81}$
4. If $(x - 6)$ is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is
(A) 3 (B) 5 (C) 6 (D) 8
5. GCD of $6x^2y$, $9x^2yz$, $12x^2y^2z$ is
a) $36xy^2z^2$ b) $36x^2y^2z$ c) $36x^2y^2z^2$ d) $3x^2y$
6. If number of columns and rows are not equal in a matrix then it is said to be a
(A) diagonal matrix (B) rectangular matrix
(C) square matrix (D) identity matrix
7. $3\sqrt{x} = 9$ then value of x is
(a) 3 (b) 9 (c) 1 (d) $\frac{1}{3}$
8. The two tangents from an external points P to a circle with centre at O are PA and PB . If $\angle APB = 70^\circ$ then the value of $\angle AOB$ is
(a) 100° (b) 110° (c) 120° (d) 130°
9. The point of intersection of $3x - y = 4$ and $x + y = 8$ is
(a) $(5, 3)$ (b) $(2, 4)$ (c) $(3, 5)$ (d) $(4, 4)$
10. $(\cot \theta + \operatorname{cosec} \theta)(\cot \theta - \operatorname{cosec} \theta)$ is
(a) 1 (b) 0 (c) -1 (d) $2\cot \theta$

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11. A tower is 60 m height. Its shadow is x metres shorter when the sun's altitude is 45° than when it has been 30° , then x is equal to

- (a) 41.92m (b) 43.92m (c) 43m (d) 45.6 m

12. In a hollow cylinder, the sum of the external and internal radii is 14cm and the width is 4 cm. If its height is 20 cm, the volume of the material in it is

- (a) $5600 \pi \text{cm}^3$ (b) $11200 \pi \text{cm}^3$ (c) $56 \pi \text{cm}^3$ (d) $3600 \pi \text{cm}^3$

13. The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height is

- (a) 1:2:3 (b) 2:1:3 (c) 1:3:2 (d) 3:1:2

14. If $P(A \cap B) = 0.3$, $P(\bar{A} \cap B) = 0.45$ then value of $P(B)$

- a) 0.14 b) 0.30 c) 0.75 d) 1

PART - II (Marks - 20)

10 x 2 = 20

Note: Answer TEN questions. Question Number 28 is compulsory.

15. Let $A = \{1, 2, 3, 7\}$ and $B = \{3, 0, -1, 7\}$, which of the following are relation from A to B? (i) $R_1 = \{(2, 1), (7, 1)\}$ (ii) $R_2 = \{(-1, 1)\}$

16. Find the domain of the function $f(x) = \sqrt{1 + 1\sqrt{-1}\sqrt{-x^2}}$

17. Find the least number that is divisible by the first ten natural numbers.

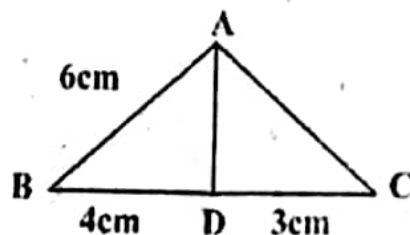
18. If $1^3 + 2^3 + 3^3 + \dots + k^3 = 44100$, then find $1 + 2 + 3 + \dots + k$.

19. Simplify:- $\frac{p^2 + p - 12}{p - 4} \times \frac{p + 3}{p^2 - 3^2}$.

20. If $A = \begin{pmatrix} 5 & 2 & 2 \\ -\sqrt{17} & 0.7 & \frac{5}{2} \\ 8 & 3 & 1 \end{pmatrix}$ then prove that $(A^T)^T = A$.

21. If α and β are the roots of the equation $3x^2 - 6x + 4 = 0$, find the value of $\alpha^2 + \beta^2$.

22. In the Figure, AD is the bisector of $\angle A$. If $BD = 4$ cm, $DC = 3$ cm and $AB = 6$ cm, find AC.



23. The vertices of ΔABC are $A(2, 1)$, $B(6, 1)$ and $C(4, 11)$. Find the equation of the straight line along the altitude from the vertex A .
24. Prove the identity $\sec^6\theta = \tan^6\theta + 3 \tan^2\theta \sec^2\theta + 1$.
25. A player sitting on the top of a tower of height 20 m observes the angle of depression of a ball lying on the ground as 60° . Find the distance between the foot of the tower and the ball. ($\sqrt{3} = 1.732$).
26. Find the volume of a cylinder whose height is 2 m and whose base area is 250 m^2 .
27. What is the probability that a leap year selected at random will contain 53 Saturdays.
28. Find the G.P in which the 2nd term is $\sqrt{6}$ and the 6th term is $9\sqrt{6}$

PART - III (Marks - 50)

Note: Answer TEN questions. Question Number 42 is compulsory. $10 \times 5 = 50$

29. Given $A = \{1, 2, 3\}$, $B = \{2, 3, 5\}$, $C = \{3, 4\}$ and $D = \{1, 3, 5\}$ check if $(A \cap C) \times (B \cap D) = (A \times B) \cap (C \times D)$ is true?
30. Find x , if $gff(x) = fgg(x)$, given $f(x) = 3x + 1$ and $g(x) = x + 3$
31. The sum of the first n , $2n$ and $3n$ terms of an A.P. are S_1 , S_2 and S_3 respectively. Prove that $S_3 = 3(S_2 - S_1)$
32. Find the sum to n terms of the series $3 + 33 + 333 + \dots$
33. There are 12 pieces of five, ten and twenty rupee currencies whose total value is Rs.105. When first 2 sorts are interchanged in their numbers its value will be increased by $\frac{1}{20}$. Find the number of currencies in each sort.
34. If $A = \begin{pmatrix} 5 & 2 & 9 \\ 1 & 2 & 8 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 7 \\ 1 & 2 \\ 5 & -1 \end{pmatrix}$ Verify that $(AB)^T = B^T A^T$
35. State and prove angle bisector theorem.
36. A line makes positive intercepts on coordinate axes whose sum is 7 and it passes through $(-3, 8)$. Find its equation.
37. If vertices of a quadrilateral are at $A(-5, 7)$, $B(-4, k)$, $C(-1, -6)$ and $D(4, 5)$ and its area is 72 sq. units. Find the value of k .
38. The horizontal distance between two buildings is 140 m. The angle of depression of the top of the first building when seen from the top of the second building is 30° . If the height of the first building is 60 m, find the height of the second building. ($\sqrt{3} = 1.732$)

39. Nathan, an engineering student was asked to make a model shaped like a cylinder with two cones attached at its two ends. The diameter of the model is 3 cm and its length is 12 cm. If each cone has a height of 2 cm, find the volume of model that Nathan made.
40. The slant height of a frustum of a cone is 4 m and the perimeter of circular ends are 18 m and 16 m. Find the cost of painting its curved surface area at Rs.100 per sq.m.
41. The rainfall recorded in various places of five districts in a week are given below. Find its standard deviation.

Rain fall (in mm)	45	50	55	60	65	70
Number of places	5	13	4	9	5	4

42. Anand chooses a date at random in April month for a tour program. Find the probability that he chooses
- (i) a Monday (ii) a Wednesday (iii) a Friday
 (iv) a Saturday or a Sunday

April					
Monday		4	11	18	25
Tuesday		5	12	19	26
Wednesday		6	13	20	27
Thursday		7	14	21	28
Friday	1	8	15	22	29
Saturday	2	9	16	23	30
Sunday	3	10	17	24	.

PART - IV (Marks- 16)

Note: Answer both questions

2 x 8 = 16

43. (A) Construct a ΔPQR in which $PQ = 8$ cm, $\angle R = 60^\circ$ and the median RG from R to PQ is 5.8 cm. Find the length of the altitude from R to PQ . **(OR)**
- (B) Draw the two tangents from a point which is 10 cm away from the centre of a circle of radius 5 cm. Also, measure the lengths of the tangents.
44. a) Draw the graph of $y = x^2 + x$ and hence solve $x^2 + 1 = 0$. **(OR)**
 b) Draw the graph of $xy = 24$, $x, y > 0$. Using the graph find,
 (i) y when $x = 3$ and (ii) x when $y = 6$.

kindly send me your key answer to our email id - Padasalai.net@gmail.com of 2.