RTVM

# REVISION EXAMINATION - 2024

**10** - Std

## MATHEMATICS

Time : 3.00 Hrs

Marks : 100

## PART - I

**Answer all the questions.** 14 X 1 = 14

1. If f : A --> B is a bijection function and if n(B) = 7 then it is equal to
   1) 7 2) 49 3) 1 4) 14
2. A = {a, b, p, o}, B = {2, 3, 4}, C = {q, r, s} then n[ (A ∪ B) X B] is
   1) 18 2) 21 3) 12 4) 81
3. If the sequence are in A.P. then the equation is
   1) Geometric progression 2) an Arithmetic progression
   3) neither an arithmetic progression nor a geometric progression
   4) a constant sequence
4. The sum of the exponents of the prime factors in the prime factorization of 5187 is
   1) 1 2) 2 3) 3 4) 4
5. Graph of a linear equation is a .....
   1) straight line 2) circle 3) parabola 4) hyperbola
6. Find the matrix X if $2X + \begin{pmatrix} 1 & 3 \\ 5 & 7 \end{pmatrix} = \begin{pmatrix} 5 & 7 \\ 9 & 5 \end{pmatrix}$

   1) $\begin{pmatrix} -2 & -2 \\ 2 & -1 \end{pmatrix}$ 2) $\begin{pmatrix} 2 & 2 \\ 2 & -1 \end{pmatrix}$ 3) $\begin{pmatrix} 1 & 2 \\ 2 & 2 \end{pmatrix}$ 4) $\begin{pmatrix} 2 & 1 \\ 2 & 2 \end{pmatrix}$
7. How many tangents can be drawn to the circle from an exterior points?
   1) one 2) two 3) three 4) zero
8. The area of triangle formed by the points and is (– 5, 0), (0, -5) and (5, 0) is
   1) 0 sq. units 2) 25 sq. units 3) 5 sq. units 4) None of these
9. The value of $\sin^2\theta + \frac{1}{1+\tan^2\theta}$ is equal to 1) $\tan^2\theta$ 2) 1 3) $\cot^2\theta$ 4) 0
10. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be
    1) 12 cm 2) 10 cm 3) 13 cm 4) 5 cm
11. The total surface area of a hemi - sphere is how much times the square of its radius
    1) π 2) 4π 3) 3π 4) 2π
12. The range of the data 8, 8, 8, 8, 8, ..... is
    1) 0 2) 1 3) 8 4) 3
13. Which of the following is incorrect?
    1) P(A) > 1 2) $0 \le P(A) \le 1$ 3) $P(\phi) = 0$ 4) P (A) + P ($\bar{A}$) = 1
14. The slope of the line which is perpendicular to a line joining the points (0,0) and (–8, 8) is 1) -1 2) 1 3) 8 4) -8

## PART - II

10 X 2 = 20

**Note : 1) Answer any 10 questions. 2. Question no. 28 is compulsory.**

15. Let A = {1, 2, 3} and B = {x / x is a prime number less than 10} find A X B and B X A.
16. A function f can be defined f(x) = 2x –3. If f(x) = f(1 - x) then find x.
17. a and b are two positive integers such that $a^b$ X $b^a$ = 800. Find 'a' and 'b'
18. If $1^3 + 2^3 + 3^3 + \ldots\ldots + k^3 = 44100$ then find 1 + 2 +3 + ..... + k.
19. Find the excluded values of $\frac{y}{y^2 - 25}$
20. If $A = \begin{pmatrix} 5 & 2 & 2 \\ -\sqrt{17} & 0.7 & 5/2 \\ 8 & 3 & 1 \end{pmatrix}$ then verify $(A^T)^T = A$.

21. Find the area of the triangle formed by the points are (1, 1), (−4, 6) and (−3, −5).
22. Find the equation of a straight line whose slope is −3 and y intercept is −5.
23. Prove that : $\frac{\cos\theta}{1+\sin\theta} = \sec\theta - \tan\theta$
24. The volume of solid right circular cone is 11088 $cm^3$. If the height is 24 cm then find the radius of the cone.
25. A cylindrical drum has a height of 20 cm and diameter 28 cm. Find its curved surface area.
26. Find the range and coefficient of range of the following data. 25, 67, 48, 53, 18, 39, 44.
27. A coin is tossed twice. What is the probability of getting exactly one head.
28. Write Menelaus theorem.

## PART - III

10 X 5 = 50

**Note :1. Answer any 10 question. 2. Question no. 42 is compulsory.**

29. Let A = {0, 1, 2, 3} and B = {1, 3, 5, 7, 9} be two sets Let f : A --> B be a function given by f(x) = 2x + 1 Represent this function. i) as a set of ordered pairs ii) in a tabule form iii) by arrow diagram iv) in a graphical form
30. Let $A = \{x \in w / x < 2\}$, $B = \{x \in N / 1 < x \leq 4\}$ and C = {3, 5} verify that $A \times (B \cap C) = (A \times B) \cap (A \times C)$
31. Find the sum to n terms of the series 5 + 55 + 555 + ..... n
32. Rekha has 15 squares colour papers of sized 10. cm , 11cm, 12 cm ,..... 24 cm. How much area can be decorated with these colour papers?
33. IF $9x^4 + 12x^3 + 28x^2 + ax + b$ is a perfect square find the value of 'a' and 'b'
34. If $A = \begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$ show that $A^2 - 4A + 5I = 0$.
35. State and prove Pythagoras Theorem.
36. Find the value of K if the area of a quadrilateral is 28 sq. units. Whose vertices are taken in the order (-4, -2), (-3, k) (3, -2) and (2, 3)
37. Show that given points form a right angled triangle using slope concept. Whose vertices are (1, -4), (,2 -3) and (4, −7).
38. From the top of a tower 50 m high, the angles of depression of the top and bottom of a tree are observed to be $30^0$ and $45^0$ respectively. Find the height of the tree.( $\sqrt{3} = 1.732$ )
39. A toy is in the shape of a cone surrounded by a hemisphere. Hemisphere and cone having same radius. Radius 7 cm of hemisphere and slant height of cone is 11 cm. Find the curved surface of the top.
40. Three fair coins are tossed together . Find the probability of getting
i) all heads ii) atleast one tail iii) atmost one head iv) atmost two tails
41. Find the coefficient of variation of 38, 40, 47, 44, 46, 43, 49, 53
42. A capsule is in the shape of a cylinder with two hemisphere struck to each of its ends. If the length of the entire capsule is 12mm and the diameter of the capsule is 3 mm how much medicine it can hold?

## PART - IV

**Note : Answer the following questions.** 2 X 8 = 16

43. a) Construct a triangle similar to given triangle PQR with the sides equal to $\frac{3}{5}$ of the corresponding sides of the triangle PQR. (scale factor $\frac{3}{5} < 1$) **(OR)**

b) Draw a circle of diameter 6 cm from a point P which is 8 cm away from its centre , Draw two tangents PA and PB to the circle and measure their lengths.

44. a) Draw the graph of xy = 24, x, y > 0 using the graph find i) y when x = 3 and ii) x when y = 6. **(OR)** b) Discuss the nature of the solution of the given quadratic equation $x^2 + x - 12 = 0$.