Tsi10M

Tenkasi District

First Revision Examination - January 2025

10-01-25.

# Standard 10

## MATHEMATICS

Time: 3.00 Hours Marks: 100

### Part - A

**I. Choose the correct answer:** **14x1=14**

1) If f:A→B is a bijective function and if n(B) = 7, then n(A) is equal to
   a) 7 b) 49 c) 1 d) 14
2) $f(x) = (x+1)^3 - (x-1)^3$ represents a function which is
   a) Linear b) Cubic c) reciprocal d) quadratic
3) Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1}+F_{n-2}$ then $F_5$ is
   a) 3 b) 5 c) 8 d) 11
4) The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \ldots$ is
   a) $\frac{1}{24}$ b) $\frac{1}{27}$ c) $\frac{2}{3}$ d) $\frac{1}{81}$
5) 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
6) Graph of a linear equation is a _____
   a) straight line b) circle c) parabola d) hyperbola
7) A tangent is perpendicular to the radius at the
   a) centre b) point of contact c) infinity d) chord
8) The area of triangle formed by the points (−5, 0) (0, −5) and (5, 0) is
   a) 0 sq.units b) 25 sq.units c) 5 sq.units d) none of these
9) The slope of the line joining (12, 3) (4, a) is $\frac{1}{8}$, the value of 'a' is
   a) 1 b) 4 c) −5 d) 2
10) If x = a tan θ and y = b sec θ then
   a) $\frac{y^2}{b^2}-\frac{x^2}{a^2}=1$ b) $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ c) $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ d) $\frac{x^2}{a^2}-\frac{y^2}{b^2}=0$
11) The total surface area of a hemi-sphere is how much times the square of its radius
   a) π b) 4π c) 3π d) 2π
12) 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
13) Variance of first 20 natural numbers is
   a) 32.25 b) 44.25 c) 33.25 d) 30
14) If the mean and coefficient of variation of a data are 4 and 87.5% then the standard deviation is
   a) 3.5 b) 3 c) 4.5 d) 2.5

### Part - B

**II. Answer any 10 qeustions: (Q.No. 28 is compulsory)** **10×2=20**

15) If A×B = {(3, 2), (3, 4) (5, 2) (5, 4)} then find A and B
16) If $f(x) = x^2-1$, $g(x) = x-2$, find a, if gof(a) = 1
17) If $13824 = 2^a \times 3^b$ then find a and b
18) Find the 8th term of the G.P. 9, 3, 1, .....
19) Solve $x^4-13x^2+42 = 0$
20) Verify that $A^2 = I$ where $A = \begin{matrix} 5 & -4 \\ 6 & -5 \end{matrix}$
21) The length of the tangent to a circle from a Point P, which is 25 cm away from the centre is 24 cm. What is the radius of the circle?
22) Show that the points (−2, 5) (6, −1) and (2, 2) are collinear.
23) If the straight lines 12y = −(p+3)x+12, 12x−7y = 16 are perpendicular then find 'P'
24) Prove that $\frac{\sin A}{1+\cos A}+\frac{\sin A}{1-\cos}=2 \text{ cosec } A$

25) If the total surface area of a cone of radius 7 cm is 704 $cm^2$, then find its slant height.

26) Two coins are tossed together. What is the probability of getting different faces on the coins?

27) If A and B are two events such that P(A) = $\frac{1}{4}$, P(B) = $\frac{1}{2}$, and P(A and B) = $\frac{1}{8}$. Find (i) P(A or B) (ii) P (not A and not B)

28) An aluminium sphere or radius 12 cm is melted to make a cylinder of radius 8 cm. Find the height of the cylinder.

**Part - C**

**III. Answer any 10 questions: (Q.No. 42 is compulsory)** **10x5=50**

29) Let A = {x∈N/1< x <4}, B = {x∈w/0 ≤ x < 2} and C = {x∈N/ x < 3} then verify that A×(B∩C) = (A×B)∩(A×C)

30) If the function f is defined by $f(x) = \begin{matrix} x+2 & x>1 \\ 2 & -1 \le x \le 1 \\ x-1 & -3 < x < -1 \end{matrix}$

Find the values of (i) f(3), (ii) f(0), (iii) f(−1.5) (iv) f(2)+f(−2)

31) In an A.P., sum of four consecutive terms is 28 and the sum of their squares is 276. Find the four numbers.

32) Rekha has 15 square colour papers of sizes 10 cm, 11 cm, 12 cm, .... 24 cm. How much area can be decorated with these colour papers?

33) Find the values of m and n if the polynomial are perfect square.
$36x^4-60x^3+61x^2-mx+n$

34) If $A = \begin{matrix} 1 & 1 \\ -1 & 3 \end{matrix}$, $B = \begin{matrix} 1 & 2 \\ -4 & 2 \end{matrix}$, $C = \begin{matrix} -7 & 6 \\ 3 & 2 \end{matrix}$ verify that A(B+C) = AB+AC

35) State and Prove Thales 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) Two ships are sailing in the sea on either sides of a lighthouse. The angle of elevation of the top of the light house as observed from the ships are 30° and 45° respectively. If the lighthouse is 200 m high, find the distance between the two ships. $\left(\sqrt{3} = 1.732\right)$

38) An industrial metallic bucket is in the shape of the frustum of a right circular cone whose top and bottom diameters are 10 m and 4 m and whose height is 4m. Find the curved and total surface area of the bucket.

39) A solid sphere of radius 6 cm is melted into a hollow cylinder of uniform thickness. If the external radius of the base of the cylinder is 5 cm and its height is 32 cm. then find the thickness of the cylinder.

40) Find the co-efficient of variation of 24, 26, 33, 37, 29, 31

41) Two dice are rolled together. Find the probability of getting a doublet or sum of faces as 4.

42) Find the equation of a straight line through the intersection of lines 5x−6y = 2, 3x+2y = 10 and perpendicular to the line 4x−7y+13 = 0

**Part - D**

**IV. Answer all the questions:** **2x8=16**

43) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{4}$ of the corresponding sides of the triangle PQR $\left(\text{scale factor } \frac{7}{4} > 1\right)$ **(OR)**
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) 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)**
Draw the graph of $y = x^2-4x+3$ and use it to solve $x^2-6x+9 = 0$.

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