



Tsi10M

Tenkasi District

Second Revision Examination - 2025

10-02-25

Standard 10
MATHEMATICS

Time: 3.00 Hours

Marks: 100

14x1=14

I. Choose the correct answer:

- 1) If the ordered pairs $(a+2, 4)$ and $(5, 2a+b)$ are equal then (a, b) is
 - a) $(2, -2)$
 - b) $(5, 1)$
 - c) $(2, 3)$
 - d) $(3, -2)$
- 2) If $n(A \times B) = 6$ and $A = \{1, 3\}$ then $n(B)$ is
 - a) 1
 - b) 2
 - c) 3
 - d) 6
- 3) The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \dots$ is
 - a) $\frac{1}{24}$
 - b) $\frac{1}{27}$
 - c) $\frac{2}{3}$
 - d) $\frac{1}{81}$
- 4) The value of $(1^3+2^3+\dots+15^3) - (1+2+3+\dots+15)$ is
 - a) 14400
 - b) 14200
 - c) 14280
 - d) 14520
- 5) For the given matrix $A = \begin{matrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 9 & 11 & 13 & 15 \end{matrix}$ the order of the matrix A^T is
 - a) 2×3
 - b) 3×2
 - c) 3×4
 - d) 4×3
- 6) The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to
 - a) $\frac{16}{5} \left| \frac{x^2z^4}{y^2} \right|$
 - b) $16 \left| \frac{y^2}{x^2z^4} \right|$
 - c) $\frac{16}{5} \left| \frac{y}{xz^2} \right|$
 - d) $\frac{16}{5} \left| \frac{xz^2}{y} \right|$
- 7) A tangent is perpendicular to the radius at the
 - a) centre
 - b) point of contact
 - c) infinity
 - d) chord
- 8) If $(5, 7)$, $(3, p)$ and $(6, 6)$ are collinear, then the value of P is
 - a) 3
 - b) 6
 - c) 9
 - d) 12
- 9) The slope of the line joining $(12, 3)$, $(4, a)$ is $\frac{1}{8}$. Then the value of 'a' is
 - a) 1
 - b) 4
 - c) -5
 - d) 2
- 10) The value of $\sin^2 \theta + \frac{1}{1 + \tan^2 \theta}$ is equal to
 - a) $\tan^2 \theta$
 - b) 1
 - c) $\cot^2 \theta$
 - d) 0
- 11) The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be
 - a) 12 cm
 - b) 10 cm
 - c) 13 cm
 - d) 5 cm
- 12) 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
- 13) The range of the data 8, 8, 8, 8, 8 is
 - a) 0
 - b) 1
 - c) 8
 - d) 3
- 14) Which of the following is incorrect?
 - a) $P(A) > 1$
 - b) $0 \leq P(A) \leq 1$
 - c) $P(\phi) = 0$
 - d) $P(A) + P(\bar{A}) = 1$

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II. Answer any 10 questions: (Q.No. 28 is compulsory)

10×2=20

- 15) A relation R is given by the set $\{x, y\} / y = x+3, x \in \{0, 1, 2, 3, 4, 5\}$ determine its domain and range.
- 16) Find K if $f \circ f(K) = 5$, where $f(k) = 2K-1$
- 17) Compute x, such that $10^4 \equiv x \pmod{19}$
- 18) In a G.P. 729, 243, 81..... find t_7 .
- 19) Determine the nature of roots for the following quadratic equation $9x^2 - 24x + 16 = 0$
- 20) Check whether AD is bisector of $\angle A$ of $\triangle ABC$ in each of the following
(i) $AB = 5$ cm, $AC = 10$ cm, $BD = 1.5$ cm, $CD = 3.5$ cm
- 21) Calculate the slope and y intercept of the straight line $8x - 7y + 6 = 0$
- 22) Find the equation of straight line which has slope $-\frac{5}{4}$ and passing through the point $(-1, 2)$
- 23) Find the angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of a tower of height $10\sqrt{3}$ m
- 24) If the total surface area of a cone of radius 7 cm is 704 cm^2 . Find its slant height.
- 25) If the ratio of radii of two sphere 4:7, find the ratio of their values
- 26) Find the range of coefficient of range of following data
(i) 63, 89, 98, 125, 79, 108, 117, 68
- 27) If $P(A) = \frac{2}{3}$, $P(B) = \frac{2}{5}$, $P(A \cup B) = \frac{1}{3}$ then find $P(A \cap B)$
- 28) Find the square root of the following rational expressions:

$$(i) \frac{121(a+b)^8 (x+y)^8 (b-c)^8}{81(b-c)^4 (a-b)^{12} (b-c)^4}$$

III. Answer any 10 questions: (Q.No. 42 is compulsory)

10×5=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) Let $A = \{1, 2, 3, 4\}$ & $B = \{2, 5, 8, 11, 14\}$ be two sets, let $f: A \rightarrow B$ be a function given by $f(x) = 3x-1$. Represent this function. (i) by arrow diagram (ii) in the table form (iii) as a set of ordered pairs (iv) in a graphical form.
- 31) The sum of three consecutive terms that are in A.P. is 27 and their product is find the three terms.
- 32) Find the sum to n terms of the series $5+55+555+\dots$
- 33) Simplify: $\frac{b^2 + 3b - 28}{b^2 + 4b + 4} \div \frac{b^2 - 49}{b^2 - 5b - 14}$
- 34) If $A = \begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$ show that $A^2 - 5A + 7I_2 = 0$
- 35) Show that in a triangle, the medians are concurrent.
- 36) Find the equation of a straight line through the point of intersection of the lines $8x+3y = 18$, $4x+5y = 9$ and bisecting the line segment joining the point $(5, -4)$ & $(-7, 6)$
- 37) If $\frac{\cos \theta}{1 + \sin \theta} = \frac{1}{a}$, then prove that $\frac{a^2 - 1}{a^2 + 1} = \sin \theta$

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- 38) A cylindrical glass with diameter 20 cm has water to a height of 9 cm. A small cylindrical metal of radius 5 cm & height 4 cm is immersed completely. Calculate the raise of the water in the glass.
- 39) A right circular cylindrical container of base radius 6 cm and height 15 cm is full of ice cream. The ice cream is to be filled in cones of height 9 cm and base radius 3 cm having a hemispherical cap. Find the number of cones needed to empty the container.
- 40) In an apartment, in selecting a houses from door numbers, 1 to 100 randomly find the probability of getting the door number of the house to be an even number or a perfect square number or a perfect cube number.
- 41) Three fair coins are tossed together. Find the probability of getting
(i) all heads (ii) atleast one tail (iii) atleast one head (iv) atleast two tails
- 42) Find the area of the quadrilateral whose vertices are at
(i) (-9, -2) (-8, -4) (2, 2) and (1, -3)

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

- 43) a) Construct a triangle PQR such that $QR = 5$ cm, $\angle P = 30^\circ$ and the altitude from P to QR is of length 4.2 cm. (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) The following table shows the data about the number of pipes and the time taken to fill the same tank

No. of pipes (x)	2	3	6	9
Time taken (in min) (y)	45	30	15	10

Draw the graph above data and hence:

- (i) Find the time taken to fill the tank when five pipes are used.
(ii) Find the number of pipes when the time is 9 minutes.
- b) Draw the graph of $y = 2x^2 - 3x - 5$ and hence solve $2x^2 - 4x - 6 = 0$

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