

Tsi10M

Tenkasi District
First Revision Examination, January - 2024



29-01-2024

Standard 10

Time: 3.00 Hours

MATHS

Marks: 100

Part - I

Note: Choose the most appropriate answer from the given four alternatives. Write the option code and the corresponding answer. 14x1=14

- 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) Let $A = \{1, 2, 3, 4\}$ and $B = \{4, 8, 9, 10\}$. A function $f:A \rightarrow B$ given by $f = \{(1, 4), (2, 8), (3, 9), (4, 10)\}$ is a
a) Many-One function b) Identify function
c) One-to-one function d) Into function
- 3) $7^{4k} \equiv \text{_____} \pmod{100}$
a) 1 b) 2 c) 3 d) 4
- 4) If the n^{th} term of a series is $3n+5$ then it is in
a) A.P. b) G.P. c) Both A.P. and G.P. d) None of these
- 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 Quadratic equation is a _____
a) straight line b) circle c) parabola d) hyperbola
- 7) If in $\triangle ABC$, $DE \parallel BC$. $AB = 3.6$ cm, $AC = 2.4$ cm and $AD = 2.1$ cm then the length of AE is
a) 1.4 cm b) 1.8 cm c) 1.2 cm d) 1.05 cm
- 8) In $\triangle LMN$, $\angle L = 60^\circ$, $\angle M = 50^\circ$. If $\triangle LMN \sim \triangle PQR$ then the value of $\angle R$ is
a) 40° b) 70° c) 30° d) 110°
- 9) The equation of a line passing through the origin and perpendicular to the line $7x-3y+4 = 0$ is
a) $7x-3y+4 = 0$ b) $3x-7y+4 = 0$ c) $3x+7y = 0$ d) $7x-3y = 0$
- 10) The straight line given by the equation $x = 11$ is
a) parallel to x axis b) parallel to y axis
c) passing through the origin d) passing through the point $(0, 11)$
- 11) $(\sec A + \tan A)(1 - \sin A) = ?$
a) $\sec A$ b) $\sin A$ c) $\operatorname{cosec} A$ d) $\cos A$
- 12) In a hollow cylinder, the sum of the external and internal radii is 14 cm 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) The sum of all deviations of the data from its mean is
a) always positive b) always negative c) zero d) non-zero integer

Part - II

Answer any 10 questions. Question Number 28 is compulsory. 10x2=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) Let $f = \{(-1, 3), (0, -1), (2, -9)\}$ be a linear function from \bar{Z} into Z . Find $f(x)$.
- 17) 'a' and 'b' are two positive integers such that $a^b \times b^b = 800$. Find 'a' and 'b'.
- 18) Find the sum to n terms of the series $0.4 + 0.44 + 0.444 + \dots$ to n terms.
- 19) Find the square root of the following expansion $\frac{144 a^8 b^{12} c^{16}}{81 f^{12} g^4 h^{14}}$
- 20) A man goes 18 m due east and then 24 m due north. Find the distance of his current position from the starting point?
- 21) Calculate the slope and y intercept of the straight line $8x-7y+6 = 0$
- 22) Find the equation of the perpendicular bisector of the line joining the points $A(-4, 2)$ and $B(6, -4)$
- 23) Prove that $\frac{\sin A}{1 + \cos A} + \frac{\sin A}{1 - \cos A} = 2 \operatorname{cosec} A$

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- 24) A 14 m deep well with inner diameter 10 m is dug and the earth taken out is evenly spread all around the well to form an embankment of width 5m. Find the height of the embankment.
- 25) A cone of height 24 cm is made up of modeling clay. A child reshapes it in the form of a cylinder of same radius as cone. Find the height of the cylinder.
- 26) Find the standard deviation of first 41 natural numbers.
- 27) What is the probability that a leap year selected at random will contain 53 Saturdays.
- 28) If α, β are the roots of the equation $ax^2+bx+c = 0$. Find the value of $\alpha^2-\beta^2$.

Part - III

Do any 10 sums. Question Number 42 is compulsory.

10x5=50

- 29) Let $A = \{x \in W / x < 2\}$, $B = \{x \in N / 1 < x \leq 4\}$ and $C = \{3, 5\}$ verify that $(A \cup B) \times C = (A \times C) \cup (B \times C)$
- 30) Let $A = \{1, 2, 3, 4\}$ and $B = \{2, 5, 8, 11, 14\}$ 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 a table form
 (iii) as a set of ordered pairs (iv) in a graphical form
- 31) 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?
- 32) Find the GCD of $6x^3-30x^2+60x-48$ and $3x^3-12x^2+21x-18$
- 33) If $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ and $I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ show that $A^2 - (a+d)A = (bc-ad)I_2$
- 34) Suppose AB, AC and BC have lengths 13, 14 and 15 respectively. If $\frac{AF}{FB} = \frac{2}{5}$ and $\frac{CE}{EA} = \frac{5}{8}$. Find BD and DC. *SIVAKUMAR, M, Sri Ram Matric HSS, Vallam - 622809, Tenkasi.*
- 35) State and prove angle bisector theorem.
- 36) Find the area of the quadrilateral formed by the points (8, 6) (5, 11) (-5, 12) and (-4, 3)
- 37) Find the equation of a straight line through the intersection of lines $5x-6y = 2$, $3x+2y = 10$ and perpendicular to the line $4x-7y+13 = 0$.
- 38) As observed from the top of a 75 m high lighthouse from the sea level, the angles of depression of two ships are 30° and 45° . If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships.
- 39) A container open at the top is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends are 8 cm and 20 cm respectively. Find the cost of milk which can completely fill a container at the rate of Rs.40 per litre.
- 40) 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.
- 41) Three unbiased coins are tossed once. Find the probability of getting at most 2 tails or at least 2 heads.
- 42) A building and a statue are in opposite side of a street from each other 35 m apart. From a point on the roof of building the angle of elevation of the top of statue is 24° and the angle of depression of base of the statue is 34° . Find the height of the statue. ($\tan 24^\circ = 0.4452$, $\tan 34^\circ = 0.6745$)

Part - IV

Answer the questions.

2x8=16

- 43) a) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{3}{5}$ of the corresponding sides of the triangle PQR. [scale factor $\frac{3}{5} < 1$] (OR)
 b) Construct a ΔPQR such that $QR = 6.5$ cm, $\angle P = 60^\circ$ and the altitude from P to QR is of length 4.5 cm.
- 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) Draw the graph of $y = (x-1)(x+3)$ and hence solve $x^2-x-6 = 0$.