

Ts10M

2

10 th Mathematics

- 22) Prove that $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \operatorname{cosec}\theta + \cot\theta$.
- 23) The radius of a spherical balloon increases from 12 cm to 16 cm as air being pumped into it. Find the ratio of the surface area of the balloons in two cases.
- 24) The volume of two cones of same base radius are 3600 cm^3 and 5040 cm^3 . Find the ratio of heights.
- 25) Find the range and coefficient of range of 63, 89, 98, 125, 79, 108, 117, 68.
- 26) Find the standard deviation of first 21 natural numbers.
- 27) Two coins are tossed together. What is the probability of getting different faces on the coins?
- 28) What length of ladder is needed to reach a height of 7 ft along the well when the base of the ladder is 4 ft from the wall? Round off your answer to the next tenth place.

Part - III**Note: Answer any Ten of the following. Question No. 42 is compulsory. $10 \times 5 = 50$**

- 29) Let $f : A \rightarrow B$ be a function defined by $f(x) = \frac{x}{2} - 1$, where $A = \{2, 4, 6, 10, 12\}$, $B = \{0, 1, 2, 4, 5, 9\}$. Represent f by (i) set of ordered pairs (ii) a table (iii) an arrow diagram (iv) a graph.
- 30) Find the sum to n terms of the series $3+33+333+\dots$ to n terms.
- 31) The sum of 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) State and prove Basic Proportionality Theorem (BPT).
- 33) Find the area of the quadrilateral formed by the points $(8, 6)$, $(5, 11)$, $(-5, 12)$ and $(-4, 3)$.
- 34) 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 points $(5, -4)$ and $(-7, 6)$.
- 35) From the top of a tower 50m high the angles of depression of the top and bottom of a tree are observed to be 30° and 45° respectively. Find the height of the tree.
- 36) 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.
- 37) Find the coefficient of variation of 24, 26, 33, 37, 29, 31.
- 38) A card is drawn from a pack of 52 cards. Find the probability of getting a king or a heart or a red card.
- 39) Find the values of m and n if the following polynomial is a perfect square $x^4 - 8x^3 + mx^2 + nx + 16$.
- 40) Show that the matrices $A = \begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -2 \\ -3 & 1 \end{bmatrix}$ satisfy commutative property $AB = BA$.
- 41) Find the number of coins, 1.5 cm in diameter and 2mm thick, to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm.
- 42) If $f(x) = 2x+3$; $g(x) = 1-2x$ and $h(x) = 3x$. Prove that $fo(goh) = (fog)oh$.

Part - IV**Note: Answer all the questions.** **$2 \times 8 = 16$**

- 43) a) Construct a triangle similar to a given triangle ABC with its sides equal to $\frac{6}{5}$ of the corresponding sides of the triangle ABC. (Scale factor $\frac{6}{5} > 1$).

SIVAKUMAR.M, Sri Ram (OR) Mathi C HSS, Vallam
 b) Draw a circle of radius 4 cm. At a point L on it draw a tangent to the circle using the alternate segment. *Thanks, Dist 627809.*

44) a) A two wheels parking zone near bus stand charges as below:

Time (in hours) (x)	4	8	12	24
Amount ₹ (y)	60	120	180	360

Check if the amount charged are in direct variation or in inverse variation to the parking time. Graph the data. Also (i) Find the amount to be paid when parking time is 6 hr. (ii) Find the parking duration when the amount paid is ₹ 150.

(OR)

- b) Discuss the nature of solutions of the quadratic equation $x^2 - 8x + 16 = 0$.