<u>SAMPLE PAPER</u> By Geetha Aravindan

- 1) Solve: $a(x + y) + b(x y) (a^2 ab + b^2) = 0$; $a(x + y) b(x y) (a^2 + ab + b^2) = 0$
- 2) Find the sum : 1 + 3 + 5 + ... + 199
- 3) Two triangle ABC and DEF are similar. The area of triangle ABC is 9 sq.cm and that of triangle DEF is 16 sq.cm. If BC = 2.1 cm, find the length of EF.
- 4) An article is sold for Rs 500 cash or for Rs 150 cash down payment followed by 5 equal monthly instalments. If the rate of simple interest charged is 18% p.a., find the amount of monthly instalment.
- 5) Renu borrowed a sum of money and returned it in three quarterly instalments of Rs 17576 each. Find the sum borrowed, if the rate of interest charged was 16% p.a. compounded quarterly.
- 6) Draw a circle of diameter 5 cm. Mark a point M at adistance of 8 cm from the centre of the circle. Through M , draw two tangents to the circle. Measure the lengths of the tangents.
- 7) A hemispherical bowl of internal radius 9 cm is full of liquid. This liquid is to be filled into cylindrical shaped small bottles each of diameter 3 cm and height 4 cm. How many bottles are necessary to empty the bowl?
- 8) A container made up of a metal sheet is in the form of a frustrum of a cone of height 16 cm with radii of its lower and upper ends as 8 cm and 20 cm respectively. Find the cost of milk which can completely fill the container at Rs 15 per litre.
- 9) A bag contains 11 white, 13 red and 12 black balls. A ball is drawn from the bag. Find the probability that (i) it is a black ball (ii) it is not a red ball
- 10) Find the missing frequency if the mean of the following is 22 years.

Age in years	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
No. of persons	12	16	6	f	9

SECTION B

- 11) Determine graphically the vertices of the triangle, the equations of whose sides are given below: 2x y + 1 = 0, x 5y + 14 = 0, x 2y + 8 = 0
- 12) Find the values of a and b such that the polynomials p(x) and q(x) have (x + 3) (x 2) as their H.C.F: $p(x) = (x^2 4x 21) (x^2 4x + a)$ and $q(x) = (x^2 5x + 6) (x^2 4x + b)$

13) Simplify:
$$\frac{x}{(x+y)^2 - 2xy} \times \frac{x^4 - y^4}{(x+y)^3 - 3xy(x+y)} \times \frac{(x+y)^2 - 3xy}{(x+y)^2 - 4xy}$$

- 14) Solve the quadratic equation: (x + 4) (x + 5) 2x = 3(x + 1) (x + 2)
- 15) In a test series Zaheer Khan took 5 wickets less than twice the number of wickets taken by Ashish Nehra. The product of the number of wickets taken by these two is 117. Find the number of wickets taken by each.
- 16) A circle touches the side BC of triangle ABC at P and touches AB and AC produced at Q and R respectively. Show that $AR = \frac{1}{2} (perimeter of \Delta ABC)$
- 17) Water is flowing at the rate of 5 km / hr through a pipe of diameter 14 cm into a rectangular tank, which is 50m long and 44 m wide. Determine the time in which the level of water in the tank will rise to 17.5 cm.

18) Prove that
$$\frac{\tan^2 \theta}{\tan^2 \theta - 1} + \frac{\cos ec^2 \theta}{\sec^2 \theta - \cos ec \ \theta} = \frac{1}{\sin^2 \theta - \cos^2 \theta}$$

(OR)

Evaluate:
$$\tan 7^{\circ} \tan 23^{\circ} \tan 60^{\circ} \tan 67^{\circ} \tan 83^{\circ} + \frac{\cos^2 20^{\circ} + \cos^2 70^{\circ}}{\sin^2 59^{\circ} + \sin^2 31^{\circ}}$$

- 19) The vertices of a triangle are (- 1, 3), (1,-1), and (5,1). Find the length of the median through the vertex (-1,3)
- 20) P and Q are the points (-2,5) and (3,2). Find the coordinates of the points R on PQ such that PR = 2QR.

SECTIONC

21) From a window 60 m high above the ground of a house in a street, the angles of elevation and depression of the top and the foot of another house on opposite side of street are 60° and 45° respectively. Find the height of the opposite house.

(OR)

Two men are on the opposite of a tower. They measure the angles of elevation of the top of the tower as 30^0 and 45° . If the height of the tower is 60 m, find the distance between them.

22) Prove that in a right triangle, the square on the hypotenuse is equal to the sum of square on the other two sides.

Use the above theorem to find the length of altitude of an equilateral triangle of side a units.

23) If a chord is drawn through the point of contact of a tangent to a circle then prove that the angles which the chord makes with the given tangent are equal respectively to the angles formed in the corresponding alternate segments.Using the above theorem prove the following:If ABC is an isosceles triangle with AB = AC, prove that the tangent at A to the

If ABC is an isosceles triangle with AB = AC, prove that the tangent at A to the Circumcircle of triangle ABC is parallel to BC

- 24) Seema has total annual income of Rs 198000 during a year. She contributes Rs 2500 per month towards PF and pays a quarterly premium of Rs 7500 towards LIC. Calculate the income tax payable in the last month if she had been paying RS 1000 per month towards income tax for the first 11 months.
- 25) The expenditure of a Nursing Home on various heads is given below:

Heads	Expenditure (in RS)		
Medicines	20000		
Food	15000		
Doctor	10000		
Nursing	5000		
Miscellaneous	10000		

Represent the data by a pie chart.

Answers:

1) $x = \frac{b^2}{2a}$, $y = \frac{2a^2 + b^2}{2a}$ 2) 10000 3) 2.8 cm 4) Rs 73.06 5) Rs 48775 7) 54 8) Rs 156.75 9) 1/3, 23/36 10) 7 12) a = 4, b = 21 13) $\frac{x}{x-y}$ 14) $\frac{-1+\sqrt{29}}{2}$, $\frac{-1-\sqrt{29}}{2}$ 15) 13, 9 17) 5 hours 18) $\sqrt{3}+1$ 19) 5 units 20) (4/3, 3) 21) (60(1+ $\sqrt{3}$)m or 163.92 m 24)Rs 5900 25) Medicines: 120°, Doctors: 60°, Nursing: 30°, Misc:60°, Food: 90°