Sample Paper – 2007
Class – X
Mathematics

TNo: C3   Nq: 25   MM: 80   Ta: 3.00 hrs   Dt. 14.12.06
Tc: Combined-III

SECTION: A
(2 marks each)

Q1.   Solve for x and y:

$$\frac{a}{x} + \frac{b}{y} = \frac{1}{2}, \; \frac{1}{ax} - \frac{1}{by} = \frac{1}{a^2 - b^2}$$

Q2.   Simplify $\dfrac{1 - x^3}{1 - y^2} \times \dfrac{1 - y^3}{1 - x^2} = \dfrac{1}{1 + xy + x + y}$

Q3.   Find the sum of first 11 odd numbers of an A.P. whose first term is 18 less than the 4th term and sum of first and third is twice of second term.

Q4.   Find the 17th term of an AP whose all terms divisible by 5 and series lies between   9 and 299.

OR

Determine P so that p-2, p, and p+2 are the three consecutive terms of an AP

Q5.   A Motor bike is available for Rs. 40500 and Cash down payment of 30,000/- following with 3000/- monthly instalments of 5 months. Find the rate of interest calculated.

Q6.   An article is available for Rs. 1000 cash or for Rs. 500 cash down payment followed by 3 equal installments. If the rate of interest is 24% find the instalment.

Q7.   Find the G.C.D. $(x^3 - x^2 - x - 2)$ and $(x^3 + 3x^2 - 6x - 8)$

Q8.   Using the quadratic formula solve the equation $x^2 - 4b^2 a^{-2} x + 3a^2 b^{-2} x = 12$.

OR

A rectangular field is 20m long and 14m wide. There is a path of equal width all around it, having an area of 111 sq. meters. Find the width of the path

Q9.   In a rhombus ABCD, prove that $AB^2 + BC^2 + DA^2 = AC^2 + BD^2$

Q10.   Two circles touch internally at a point P and a chord AB of the circle of larger radius intersect the other circle in C and D. Prove that $\angle CPA = \angle DPB$

SECTION: B
(3 marks each)

Q11.   Solve for x and y $199x - 299y = 1$, $299x - 199y = 100$

Q12.   If Point s A(1,2) B(3,-k) and C(4,1) are collinear then find the value of k.

Q13.   If a line AB 2x+ y=2 intersect x-axis at point P and y-axes at point Q. The coordinates of A(2,1) and B(4,-5). O is the origin find the area of triangle OPQ

Q14. Derive section formula
Or find the value of k if A(-1,k) and B(3,1) divide by origin of the coordinate system in 3:1.

Q15. Construct a cyclic quad. ABCD in which AB = 3 cm BC = 6 cm, AC = 4 cm, and AD = 2 cm. Construct another quad. AB'C'D' with diagonal AC' = 1.5 cm such that it is similar to quad ABCD.

Q16. Prove that $\dfrac{\tan A + \tan B}{\cot A + \cot B} = \tan A \tan B$

OR

Without using TT evaluate $\dfrac{\cos(90 - A) + \sin A}{\sec(90 - A)\cos ecA}$

Q17. The sum of the ages of a man and his son is 45 years. Five years ago, the product of their ages was four times the man's age at that time. Find their present ages.

Q18. From a solid right circular cylinder with height 10cm and radius of the base 6cm, a right circular cone of the same height and base is removed. Find the volume of the remaining solid.

Q19. Prove that the bisectors of the angles formed by producing the opposite sides (which are not parallel)of a cyclic quadrilateral intersect at right angle.

Q20 A solid metal cone with radius of base 9cm and height 16cm is melted and spherical balls diameter 6cm are made out of it. Find the number of balls made.

SECTION: C
(6 marks each)

Q21 On hypotenuse AB of a right triangle ABC, a second right triangle ABD is drawn. If BC=1cm, AC=6cm and AD=2cm then find the value of BD.

If A is the area of right angled triangle and b one of the sides containing the right angle, prove that the length of the altitude on the hypotenuse is $\dfrac{2Ab}{\sqrt{b^4 + 4A^2}}$

Q22 PP' and QQ' are two direct common tangents to two circles intersecting in points A and B. The common chord produces intersects PP' in R and QQ' in S. Prove that $RS^2 = PP'^2 + AB^2$

A circle touches all the four sides of a quadrilateral ABCD. Prove that AB+CD = BC+DA

Q23 Height of a solid cylinder is 10 cm and diameter 8cm. Two equal conical holes have been made from its both ends. If the diameter of the hole is 6cm and height 4cm find volume of cylinder, volume of one cone, surface area of remaining solid.

OR

50 persons took dip simultaneously in a hemispherical pit which has radius of 14m. What is the rise in the level of water in the pit if the average displacement of water by a person is 4000 cubic cm.

Q24 At the foot of a mountain, the elevation of its summit is 45. After ascending 1km towards the mountain up an incline of 30, the elevation changes to 60. Find the height of the mountain