Mathematics
CLASS X

TNo:	Nq: 12	MM: 39	Ta: 70 Minutes	Dt. 10.01.05
Tc: Algebra-1				

Section A: 3 marks each

Q1. Solve the following system of equations :

$$15x + 4y = 61$$
$$4x + 15y = 72$$

Q2. Reduce the following rational expression to its lowest terms :

$$\frac{x^2 + 3x + 9}{x^2 - 25} \div \frac{x^3 - 27}{(x^2 + 3x - 10)}$$

Q3 If $A = \frac{x-1}{x}$ and $B = \frac{A-1}{A}$ and A+B =2 then find nature of x.

Q4 If pth, qth, rth term of an A.P. be x, y, z respectively. Show that
$x(q-r) + y(r-p) + z(p-q) = 0$

Q5 Jan Shatabdi Express starts from Jabalpur station and it covers its one third destination in three hours and another express traintakes 1 hour more for cover the total destination. If the speed differs by 16 Km/h one train by another. Find the speeds of the both trains.

OR

The sum of numerator and denominator of a fraction is 8. If 3 is added to both the numerator and denominator the fraction becomes ¾. Find the friction.

Q6 Solve the equation
$ax + by = a - b$
$bx - ay = a + b$

Q7. Using quadratic formula, solve the following equation for x :

$abx^2 + (b^2 - ac)x - bc = 0$

OR

The sum of the squares of two positive integers is 208. If the square of the larger number is 18 times the smaller, find the numbers.

Q8. Which term of the A.P. 3,15,27,39…. is 132 more than its 54^{th} term?

OR

Derive the formula for the first n terms of an A.P. whose first term is 'a' and the common difference is 'd'

Q9. Find the sum of the following arithmetic progression

1+3+5+7+……..+199

Section B: 4 marks each

Q 10 If the p*th* term of an A.P. of 1/q and the q*th* term is 1/p, prove that the sum of pq terms is ½(pq+1).

Q.11. Solve for x: $\frac{1}{x+1} + \frac{2}{x+2} = \frac{4}{x+4}$, $(x \neq -1,-2,-4)$

Q12. Find graphically, the vertices of the triangle formed by the x-axes and the lines

$2x - y + 8 = 0$

$8x + 3y - 24 = 0$