Jan-2009.

B.Sc. (IT) Sem III
Computational
Mathematics.

Mha Oct.-08 239

Con. 239-09.

ZN-1515

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** from the remaining questions.
(3) **All** questions carry **equal** marks.

1. (a) To find root of an equation $x^3 - 2x + 5 = 0$ using bisection method. **10**
   (b) To find root of an equation $x^3 - 2x - 1 = 0$ using regular falsi method. **10**

2. (a) Solve the equation by Gauss Seidel method : **10**

$$27x + 6y - z = 85$$
$$6x + 15y + 2z = 72$$
$$x + y + 54z = 110$$

   (b) Solve the equation by Gauss elimination method : **10**

$$2x - y + 2z = 2$$
$$x + 10y - 3z = 5$$
$$x - y - z = 3$$

3. (a) Using Newton's Forward Interpolation method : **10**

x	20	23	26	29
y	0·3420	0·3907	0·4384	0·4848

Find the value of x = 21

   (b) Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using trapezoidel rule. Devide the interval (0, 6) into 6 parts **10**
each of with h = 1.

4. (a) Use Lagrange's Interpolation formula to find the value of 'y' when x = 10 **10**

x	5	6	9	11
y	12	13	14	16

   (b) Evaluate $\int_0^6 \frac{dx}{1+x^3}$ by using Simpson's 3/8 rule and Simpson's 1/3 rule. Devide interval **10**
(0, 6) into 6 parts each of with h = 1.

5. (a) Solve $y' = x^2 + \frac{2x}{y}$ with initial value of y (0) = 1, h = 0·2. Using Euler's modified method **10**
and find y (0·6) = ?
   (b) Solve y' = x + y. To find y when x = 0·5, y (0) = 1 using Euler's method. **10**

6. (a) Find the equation of Straight line using least square method for the following data :— **10**

x	0	5	10	15	20	25
y	12	15	17	22	24	30

   (b) To solve the following L.P.P. equation to maximize z = 5x + 10y. Subject to the **10**
constraints,

$$5x + 8y \leq 40$$
$$3x + y \leq 12$$
$$x, y \geq 0.$$

By graphical method.
