

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- Vth SEMESTER-EXAMINATION – MAY/JUNE - 2012****Subject code: 151601****Date: 01/06/2012****Subject Name: Computer Oriented Statistical Methods****Time: 02:30 pm – 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain Floating Point Representation of number with example. **03**
 (b) Explain different types of Errors with it's propagation during computation & how to improve the accuracy of Numeric Computation. **06**
 (c) Describe BAIRSTOW method in brief. **05**

- Q.2** (a) Explain Newton Raphson Method in detail **07**
 (b) Find the root of the equation $x^4 - x - 10 = 0$ upto 3 decimal points using Bisection Method. **07**

OR

- (b) Find the approximate root of the equation $x^3 - 4x - 9 = 0$ by using False Position Method. **07**

- Q.3** (a) Differentiate Interpolation & Extrapolation. **03**
 (b) Explain Cubic Spline Interpolation with it's conditions. **03**
 (c) Write Lagrange Interpolation Algorithm & Solve the following using it: **08**
 Find $f(x)$ at $x=4$.

X	1.5	3	6
$f(x)$	-0.25	2	20

OR

- Q.3** (a) Consider the following table: **08**

x	20	25	30
$f(x)$	0.342	0.423	0.500

Find the value of x where $f(x) = 0.399$ using Inverse Interpolation. Would you use the difference method or Lagrangian Method?

- (b) Explain Linear Regression & it's algorithm. **06**
- Q.4** (a) Estimate the value of Production for the year 1984 using Newton Forward method for following Data. **06**

Year	1976	1978	1980	1982
Production	20	27	38	50

- (b) Evaluate $\int_1^2 x^2 dx$ using Trapezoidal Rule by taking $h=1/8$. **04**
- (c) Explain Simpson 1/3 Rule in detail. **04**

OR

Q.4 (a) Solve $dy/dx = 2x - y$, $y(0) = 2$ in the range $0 \leq x \leq 0.3$ by taking $h=0.1$ using Euler's Method. **07**

(b) Solve the $dy/dx = x^2 - y$, $y(0) = 1$. Find $y(0.1)$ and $y(0.2)$, $h=0.1$ using Runge Kutta's 2nd Order Method. **07**

Q.5 (a) Use the Gauss Elimination Method to solve the equations: **07**

$$3x + 4y - z = 8$$

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

$$x + 2y - z = 2$$

(b) Solve the following equations by Gauss-Seidel procedure. The answer should be correct to 3 significant digits. **07**

$$9x_1 + 2x_2 + 4x_3 = 20$$

$$x_1 + 10x_2 + 4x_3 = 6$$

$$2x_1 - 4x_2 + 10x_3 = -15$$

OR

Q.5 (a) Find the coefficient of correlation by spearman's method from the following data & comment on the result. **07**

IQ X_i	106	86	100	101	99	103	97	113	112	110
Hours Y_i	7	0	27	50	28	29	20	12	6	17

The above data shows the correlation between the IQ of a person and number of hours spent in front of the TV per week by person.

(b) Consider the Following Data & show that 4 year centered moving averages is equivalent to a 5 year weighted moving average with weights 1,2,2,2,1. **07**

Year	Annual Sales
1983	7
1984	6
1985	1
1986	5
1987	3
1988	7
1989	2
1990	6
1991	4
1992	8
1993	3
