Seat No.: _____ Enrolment No._____

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 Langrage Interpolation Algorithm & Solve the following using it: Find *f(x)* at x=4. **08**

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) **04**

Evaluate $\int_1^2 x^2\,dx$ using Trapezoidal Rule by taking h=1/8.

(c) Explain Simpson 1/3 Rule in detail. **04**

OR

Q.4 **(a)** Solve $dy/dx = 2x - y$, $y(0) = 2$ in the range $0 \le x \le 0.3$ 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

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