

5E3114

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B.Tech. V Sem.(Main/Back) Exam. Dec. 2012

Electronics & Communication

5EC6.3 Computer Oriented Numerical & Statistical Methods

Common with 5EI6.2

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 24

Instructions to Candidates:

Attempt any five question selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. Nil2. Nil**Unit-I**

- Q.1 (a) Write a program in C to implement the matrix inverse by taking a matrix of m x n order.
- (b) Find the inverse of following matrix by using Gaussian Elimination Method.

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 3 \\ 1 & 0 & 8 \end{bmatrix}$$

OR

- Q.1 (a) Write a program in C to find Addition and subtraction of two matrices of m x n and n x m order respectively.

- (b) Find the rank of following matrix.

$$B = \begin{bmatrix} 2 & -1 & 3 \\ 1 & 0 & 1 \\ 0 & 2 & -1 \\ 1 & 1 & 4 \end{bmatrix}$$

Unit-II

- Q.2. (a) Solve the following equations by Gauss Seidel Method.

$$5x + 2y + z = 12$$

$$x + 4y + 2z = 15$$

$$x + 2y + 5z = 20$$

- (b) Write a program in C to implement the Gauss Seidel Method.

OR

- Q.2. (a) Solve the following equation by Gauss Elimination Method.

$$x_1 + x_2 - 2x_3 = 3$$

$$4x_1 - 2x_2 + x_3 = 5$$

$$3x_1 - x_2 + 3x_3 = 8$$

- (b) Write a program in C to implement the Gauss Elimination Method.

Unit-III

- Q.3. (a) Find the root of the equation $x e^x = \cos x$ in the interval $(0, 1)$ using Regula Falsi Method (Method of false position). Also write C codes for its implementation.

- (b) Find the real root of the equation $f(x) = x^3 - x - 1$ by Bisection Method. Also write C codes for its implementation.

OR

- Q.3. (a) Apply Secant Method and find the real root of the equation $f(x) = x^3 - 6x + 4$. Also write C codes for its implementation.

- (b) Find all roots of polynomial $x^3 - 6x^2 + 11x - 6 = 0$ using method of least squares.

Unit-IV

- Q.4 (a) Given $dy/dx = x - y^2$; $y(0.2) = 0.02$ find $y(0.4)$ by modified Euler's Method correct to 3 decimal places, taking $h = 0.2$. Also write C codes for its implementation.
- (b) Describe Milne's P-C Method. Apply the method to find a solution of the differential equation $dy/dx = x - y^2$, satisfies the following sets of values x and y .

x	0	0.2	0.4	0.6
y	0	0.02	0.0795	0.1762

OR

- Q.4 (a) Using Runge-Kutta method of fourth order, solve for $y(0.1)$ and $y(0.2)$ given that $dy/dx = xy + y^2$, $y(0) = 1$.
- (b) (i) Explain the Laplace Equation with example.
(ii) Explain the wave equation with example.

Unit-V

- Q.5. (a) Fit a Second degree parabola to the following data using method of least Squares.

x	0	1	2	3	4
y	0	1.8	1.3	2.5	6.3

- (b) Fit a straight line to the following data using method of least squares.

x	1	2	3	4	5
y	5	7	9	10	11

OR

- Q.5 (a) Find the coefficients of correlation when the two regression equations are.

$$X = -0.2Y + 4.12$$

$$Y = -0.8X + 8.4$$

- (b) Calculate linear regression coefficients from the following :

x	1	2	3	4	5	6	7	8
y	3	7	10	12	14	17	20	24
