

5E3114

Roll No. _____

Total No of Pages: **4****5E3114****B. Tech. V Sem. (Back) Exam., Dec. 2014****Electronics & Communication Engg.****5EC6.3 Computer Oriented Numerical & Statistical methods
Common for EC, EI****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 24***Instructions to Candidates:*

Attempt any **five questions**, 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. NIL _____2. NIL _____**UNIT – I**

Q. 1 (a) Use Gauss elimination method to find the inverse of the matrix. [8]

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

(b) Find the rank of the matrix. [8]

$$A = \begin{bmatrix} 1 & 2 & 1 & 2 \\ 1 & 3 & 2 & 2 \\ 2 & 4 & 3 & 4 \\ 3 & 7 & 4 & 6 \end{bmatrix}$$

OR

- Q. 1 (a) Write a C program to find the multiplication of two matrices with order $m \times p$ and $p \times n$ respectively. [8]
- (b) Write a C program to find the transpose of a matrix of order 2×3 . [8]

UNIT-II

- Q. 2 (a) Use Cramer's rule to solve [8]
- $$x + y + z = 11$$
- $$2x - 6y - z = 0$$
- $$3x + 4y + 2z = 0.$$
- (b) Solve the equations by using Gauss- Jordan method: [8]
- $$x + y + z = 6$$
- $$2x - 3y + 4z = 8$$
- $$x - y + 2z = 5$$

OR

- Q. 2 (a) Use Gauss-Seidel iterative method to solve the following system of simultaneous equations. (up to five iterations only). [8]
- $$x + y + z = 8$$
- $$2x + 3y - 2z = 19$$
- $$4x + 2y + 3z = 23.$$
- (b) Write a C program to find the solution of system of linear equations by using Gauss elimination method. [8]

UNIT-III

- Q. 3 (a) Find the root of the equation $\cos x - 3x + 1 = 0$ correct to three decimal positions using Regula-Falsi method. [8]
- (b) Write a computer program in C- language to solve a nonlinear equation by using secont method. rtuonline.com [8]

OR

- Q. 3 (a) By applying Newton's method, find root of the equation $\sin x = 1 + x^3$ between -2 and -1. [8]
- (b) Fit a second degree parabola to the following data [8]

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

UNIT-IV

- Q. 4 (a) Given $\frac{dy}{dx} = x - y^2$; $y(0.2) = 0.2$ find $y(0.4)$ by modified Euler's method by taking $h = 0.2$. [8]
- (b) Write a C - program to estimate the solution of the solution of the equation $\frac{dy}{dx} = f(x, y)$ at a given point using Runge - kutta method. [8]

OR

- Q. 4 (a) For the equation $\frac{dy}{dx} = \frac{2y}{x}$, $y(1) = 2$, find $y(2)$ using the Milne. Method, by taking $h = 0.25$. [8]
- (b) Find solution of two dimensional Laplace equations. [8]

UNIT-V

- Q. 5 (a) Write a C-program that first a line $y = A + Bx$ to a given set of data points by the method of least squares. Also, fit a straight line to the following data [16]

x:	-2	-1	0	1	2
Y:	1	2	3	3	4

OR

- Q. 5 Calculate the linear regression coefficients from the following data [16]

x:	1	2	3	4	5	8	10
Y:	9	8	10	12	14	16	15

Also find regression lines for the same.
