

SIXTH SEMESTER B.TECH DEGREE EXAMINATION

Branch: Electrical & Electronics

**13.604 NUMERICAL TECHNIQUES AND COMPUTER
PROGRAMMING (E)**

Time: 3 Hours

Max. Marks: 100

Answer all questions

Part – A

1. With proper syntax diagram explain the working of 'switch' statement in C.
2. Write a C program to find the sum of digits of a given number.
3. Differentiate structure and union data types in C.
4. Write a short note on different file handling functions in C.
5. Write a program to check whether a number is prime or not using functions.
6. What are the benefits of using pointers in C programs?
7. Explain bisection method for the solution of transcendental equations.
8. Write a program to find the transpose of a 3X3 matrix.
9. What are the steps involved in numerical integration by trapezoidal method?
10. Write an algorithm for the solution of ordinary differential equations by Runge-Kutta second order method.

(2×10 marks=20

marks)

Part – B

MODULE I

- 11 (a) Write a C program to get the sum of series

$$e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$$

(12)

- (b) Explain various functions defined in C for string manipulations with suitable examples.

(8)

OR

- 12 (a) Explain different control statements in C.

(10)

- (b) Write a program to find maximum and minimum element in an array.

(10)

MODULE II

- 13 (a) Differentiate the terms 'call by value' and 'call by reference' with suitable examples. (10)
- (b) Write a C program to display Fibonacci series using functions. (10)

OR

- 14 (a) Write a C program to sort the elements in ascending order in an array using pointers. (12)
- (b) What is meant by recursion in functions? Explain with suitable examples. (8)

MODULE III

- 15 (a) Solve the linear equations using Gauss elimination method.

$$x + 4y - z = -5$$

$$x + y - 6z = -12$$

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

Also write a C program for the same. (12)

- (b) Evaluate $\sqrt{28}$ to four decimal places by Newton-Raphson method? Write a C program for the same.

(8)

OR

16. Write a menu driven C program for the following operations on matrices.

(a) Inverse of matrix

(b) Addition of matrices.

(c) Eigen values and Eigen vectors of the matrix

(20)

MODULE IV

17. Write an algorithm to solve differential equations by Runge–Kutta fourth order method.

Also write a C program using above method to find the value of y for $x=0.2$ in steps

of 0.1, if $\frac{dy}{dx} = x + y^2$, given that $y(0) = 1$.

(20)

OR

18(a) Write a C program to calculate $\int_0^6 \frac{dx}{1+x^2}$ using Simpson's $\frac{1}{3}$ rd rule.

(10)

(b) Write a C program to find the value of y for $x=1$, given that $\frac{dy}{dx} = x + y$ and

$y=1$ when $x=0$, using Euler's method.

(10)