



(Pages : 3)

H – 4429

Reg. No. :

Name :

Sixth Semester B.Tech. Degree Examination, January 2020

13.604 : NUMERICAL TECHNIQUES AND COMPUTER PROGRAMMING (E)

(2013 Scheme)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. Each question carries **2** marks.

1. Write a note on the operators in C.
2. Explain any two conditional statements in C with examples.
3. What is type casting? Explain explicit type casting in C.
4. Differentiate between the while and do-while statements in C.
5. What are the uses of functions in C language? Explain with an example.
6. Write a note on recursive functions.
7. Write a program to find the inverse of a matrix.
8. Explain the static and dynamic memory allocations in C with an example.
9. Write an algorithm to find the determinant of a matrix.
10. Write a C program to find the solutions to linear equations using Gauss elimination.

(10 × 2 = 20 Marks)

P.T.O.



PART – B

Answer **one** questions from **each** Module.

Module – I

11. (a) Write a C program to reverse a given list of numbers. **10**
- (b) Write a C program to implement complex number operations using structures. **10**

OR

12. (a) Write a C program to concatenate two strings without using library functions. **10**
- (b) Write a C program to manage student information which includes roll, name, mark1, mark2, mark3 and total marks. Also write a function to print the name of students who had scored total marks greater than a given value. **10**

Module – II

13. (a) Write a recursive C function to find the n^{th} Fibonacci number. **8**
- (b) Implement the push and pop operations on a stack Using pointers. **12**

OR

14. (a) Write a C program to multiply two matrices. **10**
- (b) Implement a queue using pointers. Why is it better than array implementation. **10**



Module – III

15. Given a function $f(x)$ on floating number x and two numbers 'a' and 'b' such that $f(a)*f(b)<0$ and $f(x)$ is continuous in $[a, b]$. Here $f(x)$ represents a transcendental equation. Write a program to find the root of $f(x)$ in the interval $[a, b]$ using bisection method. **20**

OR

16. (a) Write algorithm for the Newton-Raphson method to find a root of the equation $x^3 - 2x - 5 = 0$. **10**
- (b) Write a program to solve the set of linear equations using Gauss Jordan Elimination. Eg.

$$2x - 6y + 8z = 24$$

$$5x + Ay - 3z = 2$$

$$3x + y + 2z = 16.$$



10

Module – IV

17. (a) Write a C program for numerical integration of the function $f(x)$ from $x = a$ to $x = b$ using Simpson's $\frac{1}{3}$ rule. **10**
- (b) Given a differential equation $dy/dx = f(x, y)$ with initial condition $y(x_0) = y_0$. Write a C program to find its approximate solution using Euler's method. **10**

OR

18. (a) Write a C program for numerical integration of the function $f(x)$ from $x = a$ to $x = b$ using Trapezoidal rule. **10**
- (b) Write a C program to find the Eigen values and corresponding vectors of a given matrix. **10**

