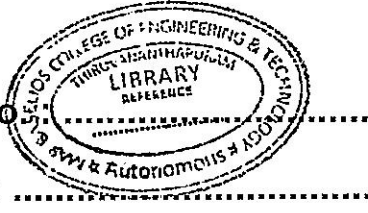


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Reg. No. ....

Name : .....



**Sixth Semester B.Tech. Degree Examination, April 2022**

**(2013 Scheme)**

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

Time : 3 Hours

Max. Marks : 100

**PART – A**

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

1. Explain unary, binary and ternary operators in C.
2. Differentiate compilation and Interpretation in computer programming.
3. How is the working of a break statement different from a continue statement when used inside a loop?
4. Explain command line arguments in C.
5. Write a recursive function to find the sum of the first n positive integers.
6. Explain the use of malloc function in C, with an example.
7. What is the use of *fseek()* function in files. Write its syntax.
8. Write a C program to find the transpose of a matrix.
9. Write a C program to find the inverse of a matrix.
10. Give an algorithm to solve algebraic equations by Gauss elimination method.

**(10 × 2 = 20 Marks)**

P.T.O.



## PART – B

Answer **one full** questions from each Module. Each question carries **20** marks.

### Module – I

11. (a) Given a list of numbers, write a C program to delete a sublist from the list if the starting index and the length of the sublist are given. **10**
- (b) Write a program to check whether the reverse of a string is itself (i.e. a palindrome). **10**

OR

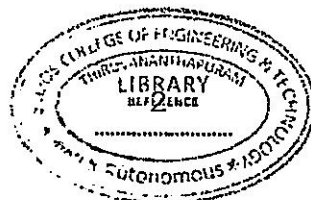
12. (a) Write a program to find the largest and second largest element of list simultaneously without sorting. **10**
- (b) Write a C program to implement queue using arrays. Why are circular queues better than linear queues? **10**

### Module – II

13. (a) What is the difference between a stack and a queue? Write a C program to implement a queue using pointers. **10**
- (b) Explain function pointers with an example. **10**

OR

14. (a) Write a C program to create a calculator with + , – , \* and / operations using command line arguments. The first argument is the first operand, second is the operator, and the third is the second operand. **10**
- (b) Write a C program to create a file and write contents, save and close the file. **10**



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### Module – III

15. (a) Given a function  $f(x)$  on floating number  $x$  and an initial guess for root, write a C program to find root of function in a given interval using Newton-Raphson method. **10**
- (b) Write a C program to find an approximation of correct to within  $10^{-4}$  by using the bisection method, starting on  $[1, 2]$ . **10**

OR

16. (a) Write a C program to find a root of the nonlinear function  $x^3 - 4x - 9$  using bisection method. **10**
- (b) Write a C program to find the Eigen values and Eigen vectors of a matrix. **10**

### Module – IV

17. Integrate to an accuracy of 1 in  $10^5$  for given limits  $a$  and  $b$ :  $\int_5^{10} \frac{\arctan(x)}{x^2} dx$ . Use Trapezoidal and Simpson rule. **20**

OR

18. (a) Given  $y' = y - x$  where  $y(0) = 3$  find  $y(0.1)$  and  $y(0.2)$  correct to four decimal places by using Runge-Kutta method, **10**
- (b) Write a C program and evaluate  $\int_0^{10} \frac{dx}{1+x^2}$  using Trapezoidal rule. **10**

(4 × 20 = 80 Marks)

