(T) Roll No. .....

PAPER ID—16150

B. Tech. EXAMINATION, 2025

(First Semester)

COMPUTER SCIENCE AND ENGINEERING

(CYBER SECURITY)

Programming for Problem Solving Using C

Time : 3 *Hours* *Maximum Marks :* 70

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) Define an algorithm.

   (b) What is a header file ? Give *one* example.

   (c) What is the difference between syntax error and logical error ?

   (d) Define a loop invariant.

   (e) What is Recursion ?

   (f) What is a wild pointer ?

   (g) Define a text file and a binary file. **14**

Unit I

2. Explain the concept of flowchart and pseudocode with suitable examples. How does pseudocode help in program design ? **14**

3. Explain Implicit Type Conversion *vs.* Explicit Type Conversion. Explain the 'Arithmetic Conversion Hierarchy.' Discuss storage classes in C. Explain auto, static, extern and register with examples. **14**

Unit II

4. Explain conditional statements in C. Write programs using if–else if–else and switch–case to illustrate their difference. **14**

5. Write a program to generate all prime numbers between 1 and N using loops. Explain the working of the loop structure used. **14**

Unit III

6. Explain 1-D and 2-D arrays with examples. Write a program to add two 2-D matrices. What are Character Arrays ? How does C mark the end of a string ? Explain the NULL character. **14**

7. Explain call by value and call by reference. Write a program to swap two numbers using call by reference. **14**

Unit IV

8. Explain dynamic memory allocation using malloc, calloc, realloc and free with suitable examples. **14**

9. Describe a structure and union. Write a program to store and display information of 10 students using an array of structure. **14**

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