Roll No. 2401000?001 Total Pages : 04

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May 2025

B. Tech. (Second Semester)

Programming for Problem Solving

(ESC-103/CSU-101-V)

Time : 3 Hours] [*Maximum Marks : 75*

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

Part A

1. (a) What is an Algorithm ? Give an example. 1.5

   (b) Differentiate between iteration and recursion with an example. 1.5

   (c) Define a variable. How is it different from a constant ? 1.5

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(d) What is the purpose of loops in programming ? 1.5

(e) What are the basic data types in C ? 1.5

(f) How do you declare and initialize an array in C ? 1.5

(g) What is the difference between while loop and do-while loop ? 1.5

(h) What is a Pointer ? How is it different from a normal variable ? 1.5

(i) Explain the use of the 'return' statement in functions. 1.5

(j) What are the advantages of using functions in C ? 1.5

Part B

2. (a) Write an algorithm and draw a flowchart to find the largest of three numbers. 10

(b) Write a C program to swap two numbers without using a third variable. 5

3. (a) Explain different types of loops in C with suitable examples. 5

(b) Write a C program to check whether a number is prime or not. 10

4. (a) Write a C program to find the sum of all elements in a 1D array. 7

(b) Implement a C program to add two matrices using a 2D array. 8

5. (a) What is a structure in C ? Write a program to store and display details of three students using structures. 5

(b) Explain the concept of sorting with C program of Bubble, Section and Insertion Sort. 10

6. (a) What is Recursion ? Write a recursive function in C for Fibonacci Series. 10

(b) What is a Pointer ? Write a C program to find the sum of two numbers using pointers. 5

7. (a) Discuss different file handling operations in C. Write a C program to read and write student records to a file. **10**

(b) Explain the difference between Linear Search and Binary Search with an example. **5**

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