H.T.No: | | | | | | | | | | | CourseCode:**241CS001**

ADITYA UNIVERSITY

B.Tech – I Semester End Examinations Supplementary – APR 2025

PROGRAMMING FOR PROBLEM SOLVING USING C
(Common to EEE, ECE, CSE, IT, CSE(DS) & AIML)

Time: 3 hours **Max. Marks: 50**

Answer ONE question from each unit
All Questions Carry Equal Marks
All parts of the questions must be answered at one place only

UNIT-I

1	a	Define algorithm and list the characteristics of a good algorithm	L1	CO1	[5M]
	b	Write a pseudo code to calculate the factorial of a given number.	L3	CO1	[5M]
		(OR)			
2	a	Explain the top-down and bottom-up approaches to problem-solving with examples.	L2	CO1	[5M]
	b	Design an algorithm to sort a list of names in alphabetical order, and explain its steps.	L3	CO1	[5M]

UNIT-II

3	a	Design a software component that uses conditional statements to determine eligibility for various benefits (such as government grants, scholarships, etc.). How to decide when to use an if-else statement over a switch statement?	L3	CO2	[6M]
	b	Write a C program to find whether a given year is a leap year or not.	L3	CO2	[4M]
		(OR)			
4	a	Write a C program to simulate a calculator using a switch case for basic arithmetic operations.	L3	CO2	[6M]
	b	Write a program to find the roots of a quadratic equation.	L3	CO2	[4M]

UNIT-III

5	a	Write a C program to perform Bubble Sort on an array of integers.	L3	CO3	[5M]
	b	Explain how to eliminate duplicate elements from an array with an example	L2	CO3	[5M]
		(OR)			
6	a	Write a program to compute the transpose and trace of a matrix. How would the program performance change when the matrix size increases?	L3	CO3	[6M]
	b	Compare Linear Search and Binary Search with examples.	L2	CO3	[4M]

UNIT-IV

7	a	Write a recursive function to calculate the factorial of a number.	L3	CO4	[5M]
	b	Explain the scope and lifetime of variables in C with examples.	L3	CO4	[5M]
		(OR)			
8	a	Write a program to find the LCM of two numbers using functions.	L3	CO4	[5M]

(P.T.O)

	b	Discuss the importance of understanding storage classes in C when developing large-scale applications. How would you decide which storage class to use in a multi-threaded environment where memory management is crucial for performance?	L3	CO4	[5M]

UNIT-V

9	a	Write a program to swap two numbers using pointers.	L3	CO5	[5M]
	b	Write text into and read text from a binary file using file functions.	L2	CO5	[5M]

(OR)

10	a	Explain the concept of dynamic memory allocation with examples of malloc() and free().	L3	CO5	[6M]
	b	Explain how to handle command-line arguments in C with an example.	L2	CO5	[4M]

*****