



VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

REG.NO.: 25MID0238

SLOT: D1

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - II
WINTER SEMESTER 2025-2026

Programme Name & Branch : M.Tech Integrated & MIC and MID
Course Code and Course Name : IACSE201 - Structured and Object-Oriented Programming
Faculty Name(s) : Dr. Anuradha G, Sukanta Ghosh, Rohith R
Class Number(s) : VL2025260501915, 3880, 1979
Date of Examination : 18/03/2026
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- MO-Module, M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- Course Outcomes
 3. Develop programs using user-defined data types like structures, unions and recognize the applications of modular programming.
 4. Experiment with the principles of Object-Oriented Programming (OOP) by developing programs that connect the concepts of objects and classes to real-world entities and promote modular and reusable code.

Q. No	Question	MO	Marks	CO	BL
1.	Explain the different storage classes available in C describe its scope, lifetime, and typical use. Write simple example snippets to illustrate how each storage class works in a program and explain the behavior of the variables declared using them.	3	10	3	1
2.	A college wants to analyze the academic performance of students in a class. Each student has a roll number, name, and marks in multiple subjects. The number of students in the class is not fixed and should be entered at runtime. Similarly, the number of subjects for each student is also dynamic and must be entered by the user. Write a C program using an array of structures to store the details of all students. Use dynamic memory allocation to allocate memory for the structure array based on the number of students entered. Also, dynamically allocate memory to store the marks of each student based on the number of subjects specified. After storing all the details, calculate the average mark for each student. If a student's average is less than 50, display that student's roll number, name, and all subject marks clearly.	3	10	3	2
3.	a) Consider the following C program that uses a recursive function to compute the Fibonacci number <pre>#include <stdio.h> int fib(int n) { if(n == 0) return 0; else if(n == 1) return 1; else return fib(n - 1) + fib(n - 2); }</pre>	3	5	3	3



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	<pre>int main() { int n = 6; printf("%d", fib(n)); return 0; }</pre> <p>i) Determine the output of the above program [1 mark] ii) Show the complete step by step expansion of the function call <i>fib(6)</i> (or) Draw the complete recursion tree for the function call <i>fib(6)</i> showing all intermediate recursive calls clearly. [2 mark] iii) Based on that, find how many times the function returns the value 0 and how many times it returns the value 1 during the execution of <i>fib(6)</i>. [2 mark]</p>				
	<p>b) Write a C++ program to perform the addition of two numbers using an inline function. The inline function should use default parameters so that if the user does not provide values, predefined default values are used for addition. Explain the key differences between an inline function and a normal function in C++.</p>	4	5		
4.	<p>A private software company wants to develop a payroll management system to calculate the monthly salary of its employees. Each employee has an employee ID, name, department, basic salary, and number of overtime hours worked in a month. The overtime payment rate is ₹500 per hour. In addition, the company provides a house allowance of 15% of the basic salary and deducts 10% of the basic salary as professional tax. Write a C++ program using a class named Employee to implement this system. The program should allow the user to enter details of multiple employees and perform all necessary salary calculations within the class because the data members cannot accessible in main function so use appropriate access specifiers for data members and member functions. In the main() function, create objects and access the required member functions to perform all operations</p> <p>The program must perform the following tasks:</p> <ul style="list-style-type: none"> • Read employee details • Calculate overtime pay • Calculate house allowance • Compute gross salary by adding basic salary, overtime pay, and house allowance and display gross salary details. 	4	10	4	2
5.	<p>Write a C++ program to create a class named Sample with the following requirements [5x2=10]</p> <p>i) Declare data members to store an integer value for each object ii) Use a constructor to initialize the data member and display a message when an object is created. Use a destructor to display a message when an object is destroyed. iii) Declare a static data member to count the total number of objects created iv) Declare a static member function to display the total number of objects created. v) In the main() function, create multiple objects and demonstrate how the static data member and static member function work.</p>	4	10	4	3