



**SCHOOL OF ELECTRONICS ENGINEERING (SENSE)
CONTINUOUS ASSESSMENT TEST - II
WINTER SEMESTER 2024-2025**

Programme Name & Branch : BTECH - Health Sciences and Technology
Course Code and Course Name : BCSE102L & Structured and Object-Oriented Programming
Faculty Name(s) : BHARATH BABU S
Class Number(s) : VL2024250501467
Date of Examination : 20-03-2025
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- Course Outcomes:
 - CO2:** Recognize the application of modular programming approach; create user-defined data types and idealize the role of pointers.
 - CO3:** Comprehend various elements of object-oriented programming paradigm; propose solutions through inheritance and polymorphism; identify the appropriate data structure for the given problem and devise solutions using generic programming techniques.

Q. No	Question	M	CO	BL
1.	You are tasked with developing a movie ticket booking system for a theatre that needs to efficiently manage ticket reservations. Since the number of bookings varies, the system should use dynamic memory allocation (DMA) to store <u>ticket IDs</u> as customers purchase, book, or cancel tickets. Users should be able to add <u>new ticket IDs</u> , <u>book tickets</u> , <u>cancel reservations</u> , and <u>display all tickets with their statuses</u> . The implementation should be done in C using pointers and functions, ensuring efficient memory management and seamless ticket operations.	10	CO2	BL3
2.	Write a C program to manage smart home devices by defining a structure named "SmartHomeDevice", which includes an ID (integer), device name (string), and energy consumption (float). Implement a function to calculate the performance rating of each device based on its energy consumption. Store multiple smart home devices in an array and allow the user to input data for 'N' devices, then compute and display their performance ratings. (Performance rating = 100/energy consumption)	10	CO2	BL3
3	Design a system to manage student records and securely access sensitive information of class members, while demonstrating the use of friend functions and friend classes in C++ to access private data members.	10	CO3	BL4
4.	A hospital system needs to track patient admissions. The system must keep count of how many times a patient has been admitted and display the total number of admissions. Create a C++ program that includes: <ul style="list-style-type: none"> ➤ A class with static data members and static member functions to track the total number of patient admissions. ➤ Demonstrate the use of these static members by creating instances of the class and showing the total number of admissions. 	10	CO3	BL3



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SLOT: E1

5.	<p>Design and implement a class hierarchy to manage and display information about different vehicles. Create a base class Vehicle with attributes for mileage and price, and another class BikeProperties containing attributes such as number of cylinders, number of gears, cooling type (air, liquid, or oil), wheel type (alloys or spokes), and fuel tank size (in inches). Derive a class Bike that inherits from both Vehicle and BikeProperties and include a member function in the Bike class to compute and display the fuel efficiency using the formula:</p> <p>Fuel Efficiency = Mileage – ((No. of Cylinders × 1.5)/ No. of Gears) – Cooling</p>	10	CO3	BL3
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