



School of Computer Science and Engineering

Winter Semester 2023-24

Continuous Assessment Test – II

SLOT: C2

Programme Name & Branch: B. Tech (Computer Science and Engineering)

Course Name & Code: Structured and Object-Oriented Programming (BCSE102L)

Class Number (s): Common to All C2 slots

Faculty Name (s): Dr. Vijayshree J

Exam Duration: 90 Min.

Maximum Marks: 50

General instruction(s):

Open Book Exam. Students can carry handwritten notes and/or text books

Answer all Questions (5 x 10 = 50 marks)

Q. No.	Question	Max Marks
1.	<p>Create a structure called employee that holds information like employee ID, name, experience and bonus. Create another structure called address which holds information like Door_Number, Street_name, City, and pincode. Declare the address structure inside the employee structure. Develop a C program to input basic salary of 50 employees and calculate their gross salary according to the given condition. Print the complete employees information and gross salary [sum of DA, HRA and basic salary].</p> <p>Given the following HRA and DA percentages:</p> <ul style="list-style-type: none">• Basic salary <20000 : HRA =10% and DA = 20% of basic salary.• Basic salary between 20000 and 40000: HRA =20% and DA = 30% of basic salary.• Basic salary >20000 : HRA =30% and DA = 40% of basic salary. <p>Also calculate the experience based bonus amount for all employees :</p> <p>Experience <5 years: 2500 rupees Experience between 5 and 10 years: 5000 rupees Experience >10 years: 7500 rupees</p>	10

2.	<p>Design a class named Triangle. Develop a C++ program that creates multiple triangle objects incorporating the following requirements:</p> <ul style="list-style-type: none"> • Each triangle object should have a unique id generated automatically. {Hint: using static member} • A no-argument constructor to initialize data members. • A parameterized constructor to initialize data members. • Incorporate setData() and getData() functions to get input values and display the data fields respectively. • Two member functions named getArea() and getPerimeter() that returns area and perimeter of the triangle. 	10
3a	<pre>#include<iostream> using namespace std; class Student{ int marks[10]; public: void setmarks(); void putmarks(); }; inline void Student::setmarks(){ int i; for(i = 0; i<10;i++){ cout<<"Enter "<<i<<"th subject marks"; cin>>marks[i]; } } inline void Student::putmarks(){ int i; for(i = 0;i<10;i++){ cout<<"Marks of subject "<<i<<" is: "<<marks[i]<<endl; } } int main(){ Student s; s.setmarks(); s.putmarks(); return 0; }</pre> <p>In the above program, two functions have been marked as <i>inline</i> functions. What would have happened if they were not marked inline. Does the use of inline keyword make any significant change in the program processing in this case? Justify your answer with suitable example.</p>	5
3b.	Write a C++ program to add two complex numbers using friend function.	5

4.	<p>Create a class Student with data members -Register number, name and age. Create another class Exam that inherits Student class with a data member "Marks" – an array to hold marks in 6 subjects. Create another class called Sports with data member – Sport name and Score. Derive another class Result that inherits from both Exam and Sports. The Result class should have a method to determine the eligibility of the student to be admitted into a course. If the average of marks in 6 subjects and sports score is greater than 75, then display "The student is eligible" else display "The student is not eligible". Include appropriate get and display methods in each of the classes. Write a main function to test the above hierarchy.</p>	10
5.	<p>Analyse the following code for any possible errors? According to you, if there is any error then justify the possible reason behind it. What can you do to resolve that issue?</p> <pre data-bbox="330 800 746 1549">#include<iostream> class A { public: void func() { cout << " I am in class A" << endl; } }; class B { public: void func() { cout << " I am in class B" << endl; } }; class C: public A, public B { }; int main() { C obj; obj.func(); return 0; }</pre>	10