



# VIT

Vellore Institute of Technology  
Established by the Government of Tamil Nadu in 1984

## SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

CAT-II, May 2023

B. Tech - Winter Semester 2022-2023

Course Code : BCSE102L

Course Title : Structured and Object Oriented Programming

Slot : D2

Duration : 90 Minutes

Max. Marks : 50

Class Numbers: Common to D2 Slot

**General Instructions:** While answering programming questions, students are instructed to write the main method also.

Answer all the questions

Q. NO	QUESTION	Marks
1	Create a structure Student with the following members: Roll_number, Name, Department, Course, Year_of_joining and Date_of_Birth. Consider implementing Date_of_Birth member as a nested structure with Day, Month and Year as members. Write a program in C language considering the following requirements: (a) Write a function to print names of all students who joined in a particular year. (5 Marks) (b) Write a function to print the details of a student if Roll_number is given. (5 Marks)	10
2	In C++, is it possible to access the private members, like member Data, member Function and Constructor by non-members who are outside to the class? Justify your answer for this question, with the features available in C++ with an example program.	10
3	a) What will be the output of the following code (4 Marks) <pre>#include &lt;iostream&gt; using namespace std; class sum { private:     int value, increment, element[20]; public:     sum(int size, int x)     {         for(int i=0;i&lt;size;i++)             element[i]=1;         int value=element[0];         for(increment=1;increment&lt;=size-1;increment++)             value = x*value+2*element[increment];         cout&lt;&lt;value;     } };</pre>	10

```
int main()
{
    sum obj(10,2);
    return 0;
}
```

b) Complete the given code:

```
#include<iostream>
#include<string>
using namespace std;
class Bank
{
    int account_no;
    string name;
    static int balance;
    .....//Complete the rest of the code.....

};
.....//Complete the rest of the code.....
```

Write a C++ program to implement withdraw() and display() functions. Create two objects for the class Bank. Let the initial *balance* amount be considered as 5000. Perform two withdraw transactions, one transaction with amount 300 and another transaction with amount 500. Call display() to display the latest balance after the two transactions. (6 marks)

4	<p>a) Compare multiple and multilevel inheritance with example code (7 marks)</p> <p>b) Whether ambiguity problem may arise in multiple inheritance or not? Discuss your view on this point. (3 marks)</p>	10
5	<p>Imagine a publishing company that markets both book and audiocassette versions of its works. Create a class <b>Publication</b> that stores the <i>title</i> (type string) and <i>price</i> (type float) of a publication. From this class derive two classes: <b>Book</b>, which has a member <i>page_count</i> (type int), and <b>Tape</b>, which has a member <i>playing_time_in_minutes</i> (type float). Implement the scenario with suitable inheritance model. In each of these three classes incorporate get_data() function to get its respective member data from the user, and a put_data() function to display its respective member data. Write a program to test the <i>Book</i> and <i>Tape</i> classes by creating instances of them.</p>	10