International Islamic University Chittagong

Department of Computer Science & Engineering

B. Sc. in CSE Semester Final Examination, Spring-2023

Course Code: CSE-1221 **Course Title**: Computer programming-II

Total marks: *50* Time: *2* hours *30* minutes

Course Outcomes (COs) of the Questions	
CO1	**Identify** basic input/output system
CO2	**Illustrate** the basic features of OOP such as polymorphism, inheritance etc.
CO3	**Demonstrate** familiarity with the use of Class library of a standard OOP language

Bloom's Levels of the Questions						
Letter Symbols	**R**	**U**	**App**	**An**	**E**	**C**
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

Answer the questions. The figures in the right-hand margin indicate full marks.

GROUP-A

			CO	DL
1 a)	Define operator overloading? Difference between Member and friend function.	2	CO1	R
b)	Overload – (negative) operator for both as a binary operator and as a unary operator.	3	CO2	App
	Or, Write a program of using the following statement properly with a C++ program: Ob2 = 50 + Ob1			
c)	Write a program to overload ++ using member function.	3	CO2	App
	Or, Construct a program to overload logical AND (&&) operator using member function.			
d)	Correct the following codes:	2	CO2	U

```
#include<iostream>
using namespace std;
class A{
   int a, b;
public:
   A(int i, int j){
      a = i;
      b = j;
   }
   operator + (int i = 12){
      A temp;
      temp.a = a + i;
      temp.b = b + i;
   }
   void show(){
      cout >> a >> b >> endl;
   }
};
void main(){
   A ob1(10,5), ob2;
   ob2 = ob1 + 10;
   ob2.show();
}
```

GROUP-B

2 a) How do the properties of the following two derived classes differ? 2 CO2 U

class D1: private B{//....}
class D2: public B{//.....}

Or,

How to invoke Base class's parameterized constructor inside Derived class's parameterized constructor?

b) Write a program to implement multilevel inheritances. 3 CO3 App

Or,

What is virtual base class? Explain with writing a program.

c) Is there any error in this code? If yes, then correct the code. Display the output. 2 CO2 U

```
class A
    {
      public:
      void cheers()
      {
        cout<<"Class A: Hip-hip-hooray";
      }
    };
    class B
    {
      public:
      void cheers()
      {
        cout<<"Class B: Hip-hip-hooray";
      }
    };
    class C:public A, public B
    {

    };
    int main()
    {
      C obc;
      obc.cheers();
    }
```

d) Create a base class called vehicle that stores the number of wheels a vehicle has and the range of vehicle. Create a derived class called car that inherits vehicle and also store the number of passengers. Then, create a derived class called truck that inherits vehicle and also stores the information of load limit. Display the information 3 CO3 App

3 a) Write a complete program that shows the uses of virtual function. 4 CO3 App

b) What do you know about early binding and late binding? Discuss the pros and cons of them. 3 CO1 R

[N.B. GROUP-A (QUESTION NO: 1&2) and GROUP-B (QUESTION NO: 3, 4,5)]

c) Correct the errors in the following program — 3 CO2 U

```
class test
  {
   private:
        int m;
   public:
        void getdata()
         {
           cout<<"Enter number";
           cin>> m;
         }
 void display()
          {
            cout << m;
          }
  };
main()
 {
     test T;
     T->getdata();
     T->display();
      Test *p;
       P=new test;
       p.getdata();
       (*p).display();
  }
```

4 a) Suppose you have a program that performs addition operations for different data types: integers, floating-point numbers, and strings. The original program provides separate functions for each data type (Add for integers, Add for doubles, and Add for strings). — 4 CO2 U

Your task is to re-factor the code using a generic function called Add. The Add function should be capable of performing addition operations for any data type.

Output:

Adding two integers: 5 and 10.
Adding two floating-point numbers: 3.14 and 2.71.
Concatenating two strings: "Hello" and "World".

Or,

You are provided with a program that calculates the average of elements in an array for different data types: integers, floating-point numbers, and characters. The original program contains separate functions for each data type (Calculate Average for integers, Calculate Average for doubles, and Calculate Average for characters).

Your task is to re factor the code using a generic function called Calculate Average. The Calculate Average function should be capable of calculating the average of elements for any data type.

Output:
Calculating the average of an array of integers: {10, 20, 30, 40, 50}.
Calculating the average of an array of floating-point numbers: {3.5, 4.7, 2.9, 6.1, 1.8}.
Calculating the average of an array of characters: {'A', 'B', 'C', 'D', 'E'}.

b)	Write a program that initializes a list with the values {10, 20, 30, 40, 50}. Perform the following operations: Remove the element at index 2. Insert the value 15 at index 1. Remove the first element from the list.	3	CO1	U
c)	What is an exception? What are the advantages of using exception handling mechanism in a program?	3	CO3	App
5 a)	Write stream classes hierarchy for console I/O operations. **Or**, Formulate the difference between manipulators and **ios** member functions.	3	CO1	R
b)	Write a program to generate a file named "Numbers.txt" that contains 50 floating-point numbers between 0 and 1. Then, read the contents of the file and display them on the screen. Implement the program, generate the file with the specified numbers, read the contents from the file, and display them on the screen. Please provide the complete program and the displayed numbers on the screen.	4	CO3	App
c)	Write a program that implements following functions: i) Width() ii) Precision() iii) Fill() **Or** Create a user-defined manipulator that formats a floating-point number to be displayed as follows: i) 12 columns width ii) Right-justified iii) Four digits precision iv) Filling of unused places with zeros	3	CO3	App