Comilla University

Faculty of Engineering

Department of Computer Science & Engineering

2nd Year 1st Semester Final Examination-2014

Course Code: CSE-211 **Session: 2012-13**

Course Title: Object-Oriented Programming Language

Full Marks: 60 **Time: 3 Hours**

[N.B.- (i) Answer any **Five** questions; (ii) Figures in the right margin indicate full marks.]

1. a) What is object-oriented programming? How is it different from the procedure oriented programming? 3
   b) What do you mean by dynamic binding? How is it useful in OOP? 3
   c) Why an array is called derived data type? 3
   d) Write a function using reference variables as arguments to swap the values of a pair of integers. 3

2. a) How does a *main()* function in C++ differ from *main()* in C? 3
   b) What is the application of *scope resolution operator* :: in C++? 3
   c) When will you make a function *inline*? Why? 3
   d) Define *friend function*. What would be the output of the following statements:

```
#include<iostream>
using namespace std;
class sample
{
int a,b;
public:
void setvalue()
{
a=25;
b=40;
}
friend float mean(sample s);
};
float mean(sample s)
{
return float (s.a+s.b)/2.0;
}
int main()
{
Sample X;
X.setvalue();
cout<<"Mean value="<<mean(X)<<"\n";
return 0;
}
```

3

3. a) Object can be defined as arrays of objects. What is the importance of it?
b) "The memory space for objects is allocated when they are declared and not the class is specified."—Is the statement true? 3
c) Define a class to represent a bank account. Include the following members: 6

1. Name of the depositor
2. Account ~~Name~~ number
3. Type of account
4. Balance amount

Member functions

1. To assign initial values
2. To deposit an amount.
3. To withdraw an amount after checking the balance.
4. Display name and balance

Write a main program to test the program.

4. a) What is a constructor? How is dynamic initialization of objects achieved? 3
b) What are the access modifiers of OOP? When do we use the protected visibility specifier to a class member? 3
c) Distinguish between the following two statements: 3

```
Time t2(t1);
Time t2=t1;
```

t1 and t2 are objects of Time class.

d) Write a program for library management where every book is initialized with its name, isbn number, page number and price. Create a book class with parameterized constructor. 3

5. a) How can you *overload* the operator by using *friend function*? 3
b) Which operator is used to convert a *class type data* to a *basic type*? How it is used? 3
c) Consider the following code. What will be the output if the program is executed?

```
#include <iostream>
class example
{
public:
  int a;
  int b;
  example operator+(const example& obj);
  void operator=(const example& obj);
};
void example::operator=(const example& obj)
{
  (*this).a = obj.a;
  (*this).b = obj.b;
  return;
}
```

```
example example::operator+(const example& obj2)
{
   example tmp_obj = *this;
   tmp_obj.a = tmp_obj.a + obj2.a;
   tmp_obj.b = tmp_obj.b + obj2.b;
   return tmp_obj;
}
int main(void)
{
   example obj1, obj2, obj3;
   obj1.a = 1;
   obj1.b = 1;
   obj2.a = 2;
   obj2.b = 2;
   obj3.a = 0;
   obj3.b = 0;
   obj3 = obj1 + obj2;
   std::cout<<obj3.a<<" "<<obj3.b<<"\n";
   return 0;
}
```

3

d) How can you *overload* the operator by using *friend function*? 3

i. a) Define ***streams***. Write down the tasks of *ios* class functions. 4

b) Write down the significance of ***getline()*** and ***write()*** functions. 3

c) What is the basic difference between *manipulators* and ***ios*** *member functions* in implementation? Give examples. 3

d) What are the advantages of using ***new*** and ***delete*** instead of using ***malloc()*** and ***free()***? 2

7. a) What are the different forms of inheritance? Give an example of each. 5

b) How do the properties of the following two derived classes differ? 2

i) Class D1: private B{//...}

ii) Class D2:public B {//...}

c) Suppose students take part in the exam. Their exam marks are calculated and create result. Write a program where Student, Exam and Result are classes. Student has name, rollNumber, Exam has mark1, mark2 and Result has totalMark properties. Moreover Student has get_rollNumber, put_rollNumber, test has get_marks, put_marks and result has display member functions. Write a program of multilevel inheritance using above properties. 5

8. a) Why should we return an object in a function? Write an example 3

b) How is *polymorphism* achieved at *compile time* and *run time*? 3

c) What is dynamic initialization of a variable? Give an example. 3

d) What does ***this*** *pointer* point to? Explain with example. 3