University of Rajshahi
Department of Computer Science and Engineering
B. Sc. Engg. Part1 Even Semester, Examination-2016
Course: CSE-1221 (Object Oriented Programming with C++)
Full Marks: 52.5 Time: 3 Hours
Answer three questions from each part

Part A

1. (a) Write some features of OOP. 2
   (b) Differentiate between structure and class with an example. 1.75
   (c) What is local class? What are the restrictions of local classes? Discuss with example. 3
   (d) Is it possible to return an object from a function? If possible, how? 2

2. a) Is it possible to have arrays of objects? If possible, how? 2
   b) What is 'this pointer'? Explain. 2
   c) Define inline function. Discuss about the restrictions with inline function. 3
   d) How can you allocate objects dynamically? 1.75

3. a) What is constructor overloading? What are the reasons to overload a constructor? 2.75
   b) Why overloading sometimes causes ambiguity? Describe with example. 3
   c) What is default argument? What are the advantages of default arguments? Give example. 3

4. a) Explain different types of inheritance with block diagram and examples. 3.5
   b) What is the ambiguity that arises in multiple inheritance? How it can be overcome? Explain with example. 2.5
   c) Discuss the implications of deriving a class from an existing class by the 'public' and 'protected' access specifiers with examples. 2.75

Part B

5. (a) Why is constructor functions executed in order of derivation? 1
   (b) How do you pass arguments to a constructor in a base class? Discuss with example. 4
   (c) Briefly discuss virtual base class with an example. 3.75

6. (a) 'The virtual attribute is inherited'- explain it with an example. 2.75
   (b) What is a pure virtual function? Discuss it with an example. 3
   (c) Differentiate between early binding and late binding. 3

7. (a) How can you define more than one generic data type in the template function? Explain with an example. 2
   (b) Can you mix standard parameters with generic type parameters in a template function? Explain. 2
   (c) Is it possible to catch a class type? Explain. 2.75
   (d) How can you restrict the type of exceptions that a function can throw outside of itself? 2

8. (a) List and explain in brief the various functions required for random access file operations. 3.5
   (b) How do 'endl' and 'setw' manipulators work? Illustrate with example. 2.5
   (c) What is the difference between opening a file with constructor function and opening a file with 'open()' function? 2.75

University of Rajshahi
Department of Computer Science and Engineering
B.Sc. (Engg.) Part-I Even Semester Examination-2015
Course: CSE1221 (Object Oriented Programming with C++)

Marks: 52.5 **[Answer any six (06) questions taking three (03) from each part]** **Time: 3 Hours**

Part-A

1. a) What is object-oriented programming? How are data and functions organized in an object-oriented program? 3
   b) What kind of things can become an object in OOP? 1.75
   c) Distinguish between the following terms: 3
      i) Inheritance and polymorphism
      ii) Objects and classes
   d) What is meant by data binding? 1

2. a) How we can run our C++ program without header files? 1.75
   b) Describe the major parts of a C++ program. 3
   c) How can you create an initialized array of objects? 2
   d) What is new and delete? What are their advantages? 2

3. a) Briefly discuss copy constructor with an example. 4
   b) Write some ambiguities of function overloading. 2.75
   c) What is a constructor? What is wrong with the constructor shown in the following fragment? 2

```
class sample { double a, b, c;
public:        double sample(); };
```

4. a) How does binary operator operate? Give an example. 3
   b) How can you create prefix and postfix forms of the increment and decrement operators? 2.75
   c) Write a fragment of program that overloads friend operator function (-). 3

Part-B

5. a) What are the different forms of inheritance? Give an example of each. 4.75
   b) In what order are the class constructors called when a derived class object is created? 2
   c) Consider the following code: 2

```
class B { };
class D1 : public B { };
class D2 : public B { };
class DD : public D1, public D2 { };
```

How can you prevent the creation of two copies of base class B in a DD object?

6. a) How is polymorphism achieved at (a) compile time and (b) run time? 2
   b) When do we make a virtual function "pure"? What are the implications of making a function a pure virtual function? 3
   c) How could we specify the types of objects a function can throw? 2
   d) When should a function throw an exception? 1.75

7. a) What is exception handling? Write the general form of exception handling. 3
   b) Is it possible to write a try block inside a function? Explain. 2
   c) Write the use of width(), precision() and fill() member functions with example. 3.75

8. a) How can you read from and write to a text file? Discuss. 3
   b) Briefly discuss getline() function with example. 2
   c) Shortly discuss random access from a file with example. 3.75

University of Rajshahi

Department Of Computer Science and Engineering

B.Sc.(Engg.) Part-I, Even Semester Examination-2014

Course: CSE1221 (Object Oriented Programming with C++)

Full Mark: 52.5 Duration: 3 Hours

[N.B. Answer any six questions taking three from each group]

Part-A

1. a) What is object oriented programming? Why is it effective over structured programming? Explain. 2.75
   b) Briefly discuss the properties of OOP language with example. 6

2. a) Write the general form of a class. Differentiate between class and object. 3
   b) What is friend function? Why is it used? Describe with an example. 3
   c) What is in-line function? What are the restrictions to in-line functions? 2.75

3. a) Can an array of objects be initialized? Explain. 3
   b) In C++ there are two ways to achieve call by reference. What are they? Discuss with example. 2
   c) How can you allocate and free memory to an object? Explain with example. 3.75

4. a) What are constructor and destructor function? Can these functions have input parameters and return type? 3
   b) There are some errors in the following program code. Find the errors and rewrite the corrected program and print the output of the program 3

```
class A                 void set(int b)          main()
{ int x;                { x=b;}                  {
public:                 int A::get()             A ob1,ob2;
int A();                { return x;}             ob1.x=10;
void set(int b);                                 ob2.set(11);
int get();                                       cout<<"The value of
}                                                x="<< ob1.get()
                                                 <<"and" <<ob2.get(); }
```

   c) What are the advantages of using reference over pointer? What are the restrictions of using reference? 2.75

Part-B

5.	a)	What are the differences between member operator function and friend operator function?	2
	b)	In case of member operator function, how does binary operator operate? Give an example.	2.75
	c)	Write a fragment of code that make use of the shorthand operators like += and -=.	2
	d)	Explain with example, how does friend operator functions add flexibility.	2
6.	a)	What is multi-level inheritance? Describe a scenario in which multi-level inheritance can cause ambiguity.	2.5
	b)	How the ambiguity mention above can be solved?	1.25
	c)	Write a short program that will use C++ I/O library to write *n* random numbers to a file.	3
	d)	What is an abstract class? Can we create instances of an abstract class?	2
7.	a)	Briefly discuss generic function. Write the general form of a template definition.	2.75
	b)	How can you overload a generic function explicitly? Explain with example.	3
	c)	How can you mix standard parameters with generic type parameters in a template function? Explain.	3
8.	a)	What is exception handling?	1
	b)	Briefly discuss try, catch and throw.	3
	c)	What is the mechanism to catch all the exceptions?	1.75
	d)	How can you rethrow an exception? Explain with example.	3

University of ...
Department of Computer Science and Engineering
B.Sc. Engg. Part-1 Even Semester, Examination-2013
Course: CSE-1221 (Object Oriented Programming with C++)
Time: 3 Hours Full Marks: 52.5

Answer **six** questions taking any **three** questions from each section

SECTION: A

1 (a) What is meant by Object Oriented Programming (OOP)? Write the features of OOP. 2+1
(b) How data hiding is accomplished in C++? Explain. 3
(c) How are data and functions organized in OOP? Explain. 2.75

2 (a) Differentiate between C and C++. When to use C++? 2+1
(b) Write the general program structure of C++ and explain each section. 3
(c) Explain about different phases for executing a C++ program? 2.75

3 (a) Write different data types used in C++. What is data abstraction? 3
(b) Discuss class and Object with example. 3
(c) Explain the accessing mechanism of data members and member functions in case of (i) inside main () function and (ii) inside a member function of the same class. 2
(d) When do you declare a member of a class static? 0.75

4 (a) Can an array of objects be initialized? Explain. 2
(b) What is "this"? Explain with an example. 2
(c) What is new and delete? What are their advantages? 2.75
(d) What is reference? Describe with example. 2

SECTION: B

5 (a) Briefly discuss inheritance with an example. 4
(b) Why is destructor function executed in reverse order of derivation? 1
(c) What are the two ways in which a derived class can inherit more than one base class? 3.75

6 (a) Explain different types of polymorphism in C++. 4
(b) Create an abstract base class shape with two members base and height, a member function for initializing and a pure virtual function to compute area(). Derive two specific classes Triangle and Rectangle which override the function area (). Use these classes in a main function and display the area of a Triangle and a Rectangle. 3
(c) Distinguish between static binding and dynamic binding. 1.75

7 (a) What is stream? Name the streams generally used file I/O. 2
(b) Explain various file modes used in C++. 3
(c) Explain the various file stream classes needed for file manipulations in C++. 1.75
(d) Explain the functions seekg, seekp, tellg, tellp used for setting pointers during file operation. 2

8 (a) What is an exception? Why do we need to handle exception? 1+1
(b) What are the keywords used in C++ for executing handling? Describe their usage with suitable example. 1+2
(c) How can you create a function template in C++? 3
(d) Give general syntax of a generic class. 0.75

University of Rajshahi
Department of Computer Science and Engineering
B.Sc.Engg.(CSE) 1st Year Even Semester 2012
Course: CSE1221 (Object Oriented Programming with C++)
Full Marks: 52.5 Time: 04 hours
[N. B. Answer any SIX questions taking at least THREE each part.]

Part A

1. a) What is a class? What is an object? 1.75
   b) What is a nested class? Why can it be useful? 1
   c) Find the error(s) in each of the following and explain how to correct it: 3

```
i. void ~Time( int );
```

ii. The following is a partial definition of class Time:

```
class Time{
public:
// function prototypes
Private:
int hour=0;
int minute=0;
int second=0;
```

iii. Assume the following prototype is declared in class Employee:

```
int Employee( const char *, const char *);
```

   d) Find the errors in the following class and explain how to correct them: 3

```
Class Example{
public:
Example(int y=10)
    : data(y)
 {
    //empty body
 }
 int getIncrementedData() const
 {
    Return ++data;
 }
 static int getCount()
 {
    cout<<"Data is "<<data<<endl;
    return count;
 }
 private:
    int data;
    static int count;
 }; // end class Example
```

2. a) What is inline function? 1.5
b) How do you tell the compiler to make a member function inline? 1.5
c) Why might the following function not be in-lined by your compiler? 1.75

```
void f1()
{
    int i;
    for(i=0;i<10;i++) cout<<i;
}
```

d) Given the following partial class, add the necessary constructor functions so that both declarations within **main()** are valid. 4

```
class samp{
    int a;
public:
    //add constructor functions
    int get_a(){return a;}
};
int main(){
    samp ob(88); // init ob's a to 88
    samp obarray[10]; // noninitialized 10-element array
    //...
}
```

3. a) Define constructor and destructor? 1.75
b) What is copy constructor? When copy constructors called? 1
c) What is the difference between the effects of the following two declarations: 1

```
Ratio y(x);
Ratio y=x;
```

d) What is the difference between the effects of the following two lines: 1

```
Ratio y=x;
Ratio y; y=x;
```

e) To illustrate exactly when an object is constructed and destructed when returned from a function, create a class called **who**. Have **who**'s constructor take one character argument that will be used to identify an object. Have the constructor display a message similar to this when constructing an object: 4

```
Constructing who#x
```

Where x is the identifying character associated with each object. When an object is destroyed, have a message similar to this displayed:

```
Destroying who#x
```

Where, again, x is the identifying character. Finally, create a function called **make_who()** that returns a **who** object. Give each object a unique name. Note that output displayed by the program.

4. a) What do you mean by operator overloading? What are the restrictions applied to operator overloading? 2.75
b) What are the advantages of overloading an operator using friend function? 3
c) Explain why protected access specifier is used while inheriting a base class? 2
d) In derived class constructors and distractors are called in which order? 1

Part B

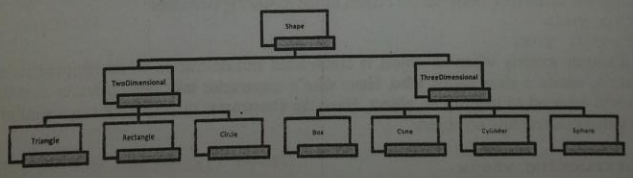
1. a) What is a friend? Do friends violate encapsulation? 1.75
   b) What are some advantages/disadvantages of using friend functions? 1.5
   c) Why should I use <iostream> instead of the traditional <cstdio>? 2
   d) What is "this" pointer? 1.5
   e) Write the output for the following lines 2

```
std::cout << i << '\n';
std::cout << "i" << '\n';
std::cout << i / j << '\n';
std::cout << "i=" << i;
```

2. a) What is multiple inheritance (virtual inheritance)? What are its advantages and disadvantages? 1.5
   b) What is a "virtual member function"? 1
   c) What is pure virtual function? What is abstract class? 1.5
   d) What is wrong with the following definitions: 1.75

```
class X
{protected:
      Int a;
};
class Y: public X
{public:
      Void set(X x, int c) { x.a=c;}
}
```

   e) Implement the following class hierarchy: 3



3. a) Distinguish between runtime and compile time polymorphism? How runtime polymorphism is achieved? 3.75
   b) What is the difference between virtual function and overloaded function? 2
   c) What is a pure virtual function? How a pure virtual function is declared? 1
   d) Define early binding and late binding with example. 2

4. a) What's the idea behind templates? What's the syntax / semantics for a "class template"? 1
   b) Define a Swap function template for swapping two objects of the same type 1
   c) What are some ways try / catch / throw can improve software quality? 1.75
   d) How should I handle resources if my constructors may throw exceptions? 1
   e) Consider the following function which is used for receiving a packet in a network system: 4

```
void ReceivePacket (Packet *pack, Connection *c)
{
      switch (pack->Type()) {
           case controlPack: //...
                break;
           case dataPack: //...
                break;
           case diagnosePack: //...
                break;
           default: //...
       }
}
```

Suppose we wish to check for the following errors in *ReceivePacket:*

- That connection c is active. `Connection::Active()` will return true if this is the case.
- That no errors have occurred in the transmission of the packet. `Packet::Valid()` will return true if this is the case.
- That the packet type is known (the `default` case is exercised otherwise).

Define suitable exceptions for the above and modify `ReceivePacket` so that it throws an appropriate exception when any of the above cases is not satisfied.

University of Rajshahi
Department of Computer Science and Engineering
B.Sc. Engg.(CSE) 1st Year 2nd Semester 2011
Course: CSE 1221 (Object Oriented Programming)
Time: 4 Hrs. Full Marks: 52.5
[N.B. Answer SIX questions taking at least THREE from each part.]

Part-A

1. a) Define Object Oriented Programming (OOP). What are features of OOP? 3.75
   b) What are differences between OOP and Procedural Programming? 3
   c) What are the differences between 'class' and 'structure'? 2

2. a) What are 'class' and 'object'? 2
   b) How are memory allocated for different type of members of a class? 2
   c) What are advantages of using 'static member variable' and 'static member function' of a class? 2
   d) Give an example of 'nested class member'. 2.75

3. a) What is operator overloading? Why is it necessary? 2
   b) Why overloading sometimes caused ambiguity? Which type of ambiguity may arise? 2
   c) What is the difference between early binding and late binding? 3
   d) What is default argument? 1.75

4. a) Is there any way to access private member of a class without taking help of own member function of that class? Explain your answer with an example. 3.75
   b) What are multiple, multilevel and hybrid inheritance? 2
   c) Explain how 'virtual inheritance' can solve the problem that is caused when any member of base class may be inherited in different ways to a 'high level derived class'. 3

Part-B

5. a) Can pointer to a base class be assigned to a pointer to derived class, or, vice versa? 2
   b) If both the base class and derived class have a member of same name, which member of the respective class can be and can't be, accessible by the above pointer assignment. 3
   c) Explain, with an example, what is the role of 'virtual function' for above situation. 3.75

6. a) What are 'unary' and 'binary' operator overloading? 2
   b) Why, if friend function is not used, then, left-side argument of binary operator can neither be built-in data type nor be an object of the class other than class having the respective overloaded operator function. 3
   c) Give an example of 'unary' operator overloading. 3.75

7. a) How is Java more secured than other languages? 2.75
   b) Why is Java known as platform-independent language? 2
   c) What types of naming convention should be followed when declaring package, variables, methods, and constant? 4

8. a) What is 'function template'? 2
   b) Give an example of 'function template'. 2.75
   c) Explain how exception is handled by using 'try', 'catch' and 'throw'? 2
   d) What are Java package and Java applets? 2