Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

III SEMESTER B.TECH (COMPUTER SCIENCE AND ENGINEERING)

END SEMESTER MAKEUP EXAMINATIONS, NOV/DEC 2015

SUBJECT: OBJECT ORIENTED PROGRAMMING USING C++ [CSE 207]

REVISED CREDIT SYSTEM
Date:

Time: 3 Hours   MAX. MARKS: 50

Instructions to Candidates:

❖ Answer **ANY FIVE** questions.

❖ Missing data, if any, may be suitably assumed.

1A. Give a comparison of C and C++ (atleast 4 differences).   4M

1B. What is a function prototype?   Why is prototyping important? Write the function prototype for a function *Interest* that takes three parameters: Principal (int), Rate(float) and Time (int) and returns float. The Rate has got a default value of 11.5.   4M

1C. Give the syntax of declaring a reference variable. Explain with an example, how do you achieve call by reference using reference variable?   2M

2A. Differentiate between mutable data member and static data member? Explain with an example?   3M

2B. What is the use of declaring a class as a friend of another? Explain with an example? State whether friendship can be transitive.   3M

2C. Define a class named *Movie*. Include private fields for the *title*, *year*, and *name of the director*. Include three public functions with the prototypes *void Movie::setTitle(string);, void Movie::setYear(int);*, and *void setDirector(string);*. Include another function that displays all the information about a Movie. Write a main( ) function that declares a movie object named myFavoriteMovie and sets and displays the object's fields.   4M

3A. What is dynamic memory allocation? Explain with an example how to allocate and deallocate memory dynamically for a single object and an array of objects?   3M

3B. Explain the different types of constructors with an example for each.   3M

3C. With an example for each, explain how do you implement the following types of Inheritance:
    (i) Multilevel Inheritance
    (ii) Hierarchical Inheritance   4M

4A. Describe the mechanism of Virtual functions with an example?   3M

4B. Write a C++ program ,a class hierarchy is created that performs conversions from one system of units to another. (For example, Liters to Gallons and Fahrenheit to Celsius) The base class convert declares two variables, val1 and val2, which hold the initial and converted values, respectively. It also defines the functions getinit( ) and getconv( ) , which return the initial value and the converted value. These elements of convert are fixed and applicable to all derived classes that will inherit convert. However, the function that will actually perform the conversion, compute( ) , is a pure virtual function that must be defined by the classes derived from convert. The specific nature of compute( ) will be determined by what type of conversion (i.e. Liters to Gallons and Fahrenheit to Celsius.) is taking place.   5M

4C. Explain with neat sketch, functions invoked by try block throwing exception?   2M

5A. Under what circumstances, operator overloading becomes mandatory? Explain any three circumstances.   3M

5B. In which order the constructors and destructors are called when an object of derived class is created?   2M

5C. Define a class **Time** with 2 private data members: hours and minutes. Write default and parameterised constructors. Overload the operator << to print **Time** object. Overload > to check whether one Time object is greater than other and return true or false. Overload + operator to add an integer representing number of hours to a **Time** object and return a **Time** object. Overload the pre increment operator. Consider incrementing hours when minutes reach 59. A sample main() of this program is as given below:

```
int main()
{
        Time  T1(11, 59), T2(10,45),T3;
        T3=5+T2;
         ++T1;
        if (T1>T2) cout<<"T1  is greater";
        cout<<T1; cout<<T3;
        return 0;
}
```
          5M

6A. Briefly describe the class hierarchy provided by C++ streams handling?   3M

6B. What are text mode and binary mode input/output? What are their corresponding strengths and weaknesses?   3M

6C. Describe the read( ) and write( ) functions, their prototype, use, and the way they input and output data?   4M