CIIT SAHIWAL

Assignment No. 1 (Object Oriented Programming)

Instructor: Sami Hassan Due Date: March, 06 2015

Max Marks: 50

Any assignment found copied will be awarded zero marks.

1. Following is a declaration for a class to represent Complex numbers. A Complex number has two parts, the real part (let's say a) and the imaginary part (say b), and is represented as a+bi where i has a value of sqrt (-1). Write the implementation of the class.

```
class complex
{
 private: float real;    // Real Part
 float imag;    // Imaginary Part public:
complex(float,float);  //2-arg constructor with default parameters
complex add(complex);
complex subtract(complex);
complex multiply(complex);
 complex divide(complex);
 complex getconjugate();
 void setdata(float,float);   //assigns the values passed as arguments to the object on which setdata is called
void getdata();   //takes real and imag as input from user
 float getreal();   //returns data member real
 float getimaginary();  //returns data member imag

void display();    //displays the complex number in the form a+bi
};
```

Addition of two complex numbers: $(a + bi) + (c + di) = (a + c) + (b + d)i$

Multiplication of two complex numbers: $(a + bi)(c + di) = (ac - bd) + (bc + ad)i$

Subtraction of two complex numbers: $(a + bi) - (c + di) = (a - c) + (b - d)i$

Division of two complex numbers:

Conjugate of a complex number: The conjugate of a + bi is a –bi

2. Modify the following class to write one constructor equivalent to the three constructors so that the output of a program using the Point class remains the same.

```
class Point
{
int x, y;
 public:
 Point():x(0),y(0){}
Point (int xVal):x(xVal),y(0){}
Point (int xVal,yVal):x(xVal),y(yVal) {}
 void display( );
 };
```

3. Create a class “Employee” that contains two data members: an employee number (of type int) and an employee compensation (of type float). Write a constructor that allows creation of objects with no, all or limited information. Member function getEmployee() should allow the user to enter employee’s data and a member showRecord() to display the information of the Employee. There should also be a member function setEmployee that allows changes the employee number or his compensation. Create atleast three employees and display their record.

4. Create a “Date” class that should consist of data members: month, day and year (all of type integers). The class should also have two member functions get_date that allows the user to enter date in 31/12/97 (DD/MM/YY) format. Make a function show_date that displays the date entered by user in the form “31 December 1997”.

5. Make a class Student with the data members String Name, int ID_No, double GPA, int semesters. All data members should be kept private. The system should be able to create an instance of student even when the user has NO or limited record information of a student. There should be ONE constructor only. The class should also have functions, one for each of the following purposes: displaying the Students record for e.g. Student ID # 10433: Ahmad His Grade Point Average till 4 semesters is 3.11 altering the name of the student. Altering the GPA. altering the number of semesters.