

Philadelphia University Faculty of Engineering Department of Computer Engineering		Date:- 01/04/2015 Allowed time:- 60 minutes
Object Oriented Programming (630221)		First Exam
Student Name: - ID: -		

Question1: Mark the following statements as true or false. 5 points

- 1) The member variables of a class or structure must be of the same type.
- 2) The member methods of a class must be public.
- 3) const methods in a class can update the member variables of the class.
- 4) the constructor of a derived class can call the constructor of base class only if the call stated explicitly in the definition of derived class constructor.
- 5) the public data members of base class A become a protected data members of derived class B if class B inherit class A as private.

Question2: Assume that you have the following definition of a struct. 5 points

```
struct partst_type
{
    string part_name;
    int part_num;
    double price;
    int quantities_In_stock;
};
```

Perform the following tasks.

- 1) use pointer to Declare an array, **inventory**, of 100 components of type **parts_type**.
- 2) Write a C++ code to initialize each component of inventory as follows: **part_name** to "PART" string, **part_num** to -1, **price** to 0.0, and **quantities_In_stock** to 0.
- 3) Write a C++ code that uses a loop to output the data stored in **inventory** array.

Question 3: Write a class called Employee which have the following characteristics 5 points

- 1- The class name is Employee
- 2- The class have 4 variables as followings:
 - a. Name of type string.
 - b. NN of type long
 - c. Birth_Date of type int
 - d. Job of type string
- 3- The class have a member methods as the following
 - a. Constructor that take no arguments and initialize the variables with default parameters(Name to NULL ,NN to 0 , Birth_Date to 0 and Job to NULL.
 - b. constructor that take arguments of Name,NN,Birth_Date and job to initialize the member variables of class.
 - c. A const Display method to display the information of the class on screen.
 - d. A const member methods to return each variable.
 - e. A method to update the variables a the class.
- 4- Write the definition of the above member method (use inline method if possible).

Question4: Consider the following class definition:

5 points

```
class circle {
    public:
        void print() const;
        void setRadius(double) ;
        double getRadius() ;
        double area() ;
        circle();
        circle(double) ;
    private:
        double radius;
} ;
```

- 1- write a definition for class cylinder that inherit the class circle as the base of cylinder and add the following:
 - a. A double data member for height
 - b. 2 constructors the first one take no arguments and the second take two double arguments
 - c. A method print
 - d. A method get_height to return the value of the height
 - e. A method set_height to update the value of the height
 - f. A method volume to calculate and return the volume
 - g. A method area to calculate and return the surface area
- 2- Write a definition for the methods described above (use inline method if possible).