University of Technology
Department of Computer Science
Final Exam / 2015 -2016

Subject: Object Oriented Prog. *Year: second*
Branch: SW & AI *Time: 3 Hours*
Examiners: L. Eklas Falih *Date: 24 / 5 /2016*

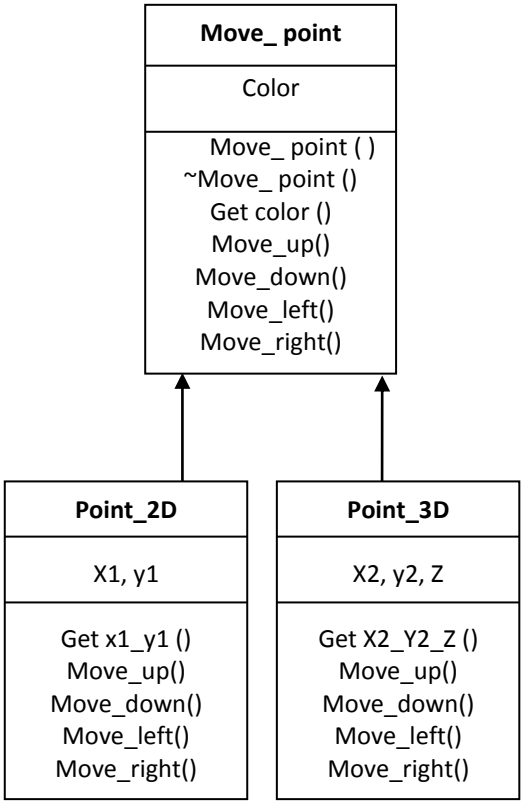
Note: Answer Four questions only (12.5 marks for each question)

Q1// Write an object oriented program that convert an hour into its equivalent in minute. Create two classes called **Hour** and **Minute**. The program includes a friend class which contains function called **convert()** that convert an hour value into its equivalent in minute value according to the formula **1hour=60 minute**.

Q2// Write an object oriented program to decrease the length of string. Create a class called **String** that has one item of type char **word** decrement the length of string based on occurrence the character (**a**) using (**- -**) operator. The main program includes a declaration of an array of **100 pointers** of type String.

Q3// Write an object oriented program that include a class called **array** that may be of any type. Use the concept of **template class** to write the program. The array class includes a constructor, and two functions **read**()and **display**() array elements and a function to sum the odd numbers in class array. The main program includes the call of the functions to three objects of type integer array, float array and long array.

Q4// Consider the following figure which represents classes to implement the point movement operation and using the concepts of inheritance and pure virtual functions:



Create a class called Move_point that includes the color (string) as private. From this class create two derived classes:

- Point_2D, which includes private variables: x1 (type integer) and y1 (type integer).
- Point_3D, which includes private variables: x2 (type integer), y2 (type integer) and Z (type integer).

Each of the three classes should have constructor, destructor, function **Move_up()** to move the point up y axis by a value, **Move_down()** function to move the point down y axis by a value, **Move_left()** function to move the point left x axis by a value, and **Move_right()** function to move the point right x axis by a value .

Hint: the main program includes the following declaration: **Move_point * PointPtr[100];**

Q5/ Trace the following program and find the output from it

```
class test1

{

private :    int  x,y;

public:

void get() { cin>>x; }        void process() { y=x+3;  }     void show()    { cout<<y; }

};

class test2

{

private :     int   a,b;

public:

void get()    { cin>>a;  }   void process() { b=a*3;  }   void show()   { cout<<b; }

};

class test3:  public test1,  public test2

{   };

void main()

{

test3    t;

t.get();      t.process();         t.show();

}
```

Best Wishes