

Philadelphia University Faculty of Engineering Department of Computer Engineering		Date:- 06/05/2015 Allowed time:- 60 minutes
Object Oriented Programming (630221)		second Exam
Student Name: - ID: -		

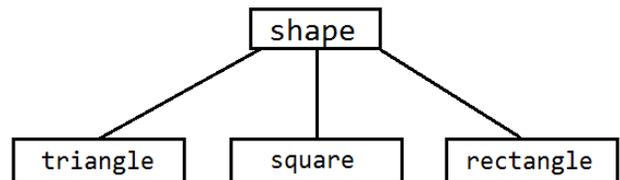
Question 1: mark the following statements as true or false.

Copy constructor and assignment operator = are the same.	
Abstract class is the class that all its methods are pure virtual methods	
Friend function cannot access private data members of the class but can access the protected and public members	
To override operator << we can use either friend or member function.	
Template can create a general code to be used with different data types.	

Question 2 :Perform the following

1. Write a statement that declares sales to be a pointer to a pointer of type double.
2. Write a C++ code that dynamically creates a two-dimensional array of five rows and seven columns and sales contains the base address of that array.
3. Write a C++ code that inputs data from the standard input device into the array sales.

Question 3: Given the following hierarchy of class



1. Define a class shape which will be an abstract base class
2. Define a class triangle which contains base and height attributes
3. Define a class square which will contain side attribute
4. Define a class rectangle which will define width and height attributes

Consider the main definition bellow which will use the class hierarchy you created.

```

int main()
{
    shape** sarr;
    sarr=new shape*[3];
    sarr[0]=new triangle(3,5);
    sarr[1]=new square(4);
    sarr[2]=new rectangle(6,2);

    for(int i=0;i<3;i++)
    {
        cout<<"shape info\n";
        sarr[i]->display();
        cout<<"shape area="<<sarr[i]->area()<<endl;
    }
    return 0;
}
  
```

Question 4: Given the following class classA perform the following:

1. overload operator << so you can output the value of x and y respectively
2. override the operator < where object a is less than object b if (a.x<b.x) or (a.x==b.x and a.y<b.y)

```
class classA
{
    public:
        void print() const;
        classA(int a,int b){x=a;y=b;}
private:
    int x;
    int y;
};
```