PART I - 10 SHORT QUESTIONS (20 Points: 2 points for each Question)

For the following ten questions circle the letter "T" or the letter "F" to indicate whether or not each of the statements is true or false, respectively.

1. (T) F : Public data member of a class can be initialized in the class definition.

2. T F : "Constant Data Members" of an object, must be given a value at construction time.

3. (T) F : The "this Pointer" allows objects to access their own address.

4. (T) F : A class's private members can be accessed only by member functions of that class.

5. (T) F : Static data members must be initialized only once at file scope.

6. T (F) : Constructor doesn't return anything and it should be declared with a return type "void".

7. (T) F : A destructor is a special class member function that is invoked automatically when an object of that class is destroyed

8. T (F): Operator Overloading can be used to define new operators.

9. T (F): Attempting to overload the "<<" operator is a syntax error.

10. T (F): Only one destructor per class thus "Overloading" is not allowed.

Name:		
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PART II - 6 PROBLEMS (35 Points)

1. What is the output of the following program when it is executed? **(6 Points)**

```
#include <iostream.h>
class A {
  private:
    int iVal;
    float fVal;
  public:
    void f1() const {
        cout << iVal << "   " <<fVal<< endl;
    }
    int f2() {
        --fVal;
        iVal++;
        return iVal;
    }
    void f3(int i) {
        iVal +=i;
    }
    A() {
        iVal=10;
        fVal=0.0;
    }
};

void main() {
    A a1,a2;
    a2.f1();
    a2.f3(10);
    cout <<a2.f2() << endl;
    a2.f1();
    a1.f1();
    a1=a2;
    a1.f1();
}
```

Output ?

10	0.0
21	
21	-1.0
10	0.0
21	-1.0

2. What is the output of the following program when it is executed? **(5 Points)**

Output!

```
#include <iostream.h>
class A {
  public:
    void fx() const {
        cout <<x << endl;
    }
    A() {
        x=73;
    }
    ~A() {
        fx();
    }
    int x;
};
```

```
void main() {
    A a1[2];

    a1[1].fx();
    a1[0].x +=2;
    a1[1].x -=2;
}
```

3. What is the output of the following program when it is executed? (**6 Points**)

```cpp
#include <iostream.h>
#include <string.h>

class A {
  public:
    void fc() const {
        cout << cl << endl;
    }
    A() {
        strcpy(cl,"you");
    }

    A(char *p) {
        strcpy(cl,p);
    }

  private:
    char cl[20];
};

void fc() {
    A obj;
    obj.fc();
}

void main() {
    fc();
    A cl("Testing");
    cl.fc();
}
```

4. What is the output of the following program when it is executed? **(6 Points)**

```cpp
#include <iostream.h>
class A {
  private:
    int xy;
  public:
    static int ct;
    A () {
        ct -=1;
        xy = 10;
    }
    int f1() const {
        return xy;
    }
    void f2() {
        xy +=1;
    }
};

int A::ct = 10;

void main() {
    A a1, *p;
    cout << a1.f1() << endl;

    p = &a1;
    cout << A::ct << endl;

    p->f2();
    cout << p->f1() << endl;
}
```

output :
10
10
11

5. What is the output of the following program when it is executed? **(6 Points)**

```cpp
#include <iostream.h>
class A {
  private:
    int xy;
    const int pq;
  public:
    static int ct;
    A (int i, int j):pq(j) {
        xy = i;
    }
    int f1() const {
        return pq;
    }
    int f2() const {
        return xy;
    }
};
```

```
void main() {
    A a1(10,20);
    int one,two;

    one = a1.f1();

    two = a1.f2();

    cout << one << " " << two << endl;
}
```

6. What is the output of the following program when it is executed? (**6 Points**)

```
#include <iostream.h>
class A {
  private:
    int xy;
  public:
    A (int i){
        xy = i;
    }
    A & f1() {
        xy = xy*10;
        return *this;
    }
    void f2() const {
        cout << xy;
    }
};

void main() {
    A a1(5);

    a1.f1().f2();
}
```

PART III – ONE PROBLEM (45 Points)

Create class **<u>Book</u>** that will be used to hold book information.
The class should have the following data members:
- **bookNbr**   – The book's *Identification Number*
  (<u>Greater or equal to 1000</u>. Defaults to **0**)
- **Title**   – The book's title.
  (Maximum of 30 characters. Defaults to **Empty String**)
- **Price**   – The price of the book in US dollars.
  (<u>Between 0.0 and 100.0 inclusively</u>. Defaults to **0.0**)

and the following ***member functions***:
- A **constructor** with no arguments.
- An **overloaded constructor** that takes as arguments, the values to set the data members.
- All needed "set" functions with the ***integrity checks***.
- All needed "get" functions.
- A function that **print** to the screen the contents of the data members.

Write a program to test your class as following:
- Ask the user to enter the number of books to create.
- ***Dynamically*** create the objects for the requested number of books.
- Ask the user to fill the data for all created book objects.
- Fill the data for all created book objects from the keyboard.
- Finally, print on the screen (using the print member function) the information of the books with a price less than **25.50 US dollars** .

Note: *<u>Use the space bellow to write your answer. You may use the back of the page if necessary.</u>*