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CS304 Object Oriented Programming
Mid Term Examination – Spring 2005
Time Allowed: 90 Minutes

Please read the following instructions carefully before attempting any of the questions:
1. Attempt all questions. Marks are written adjacent to each question.
2. Do not ask any questions about the contents of this examination from anyone.
a. If you think that there is something wrong with any of the questions, attempt it to the best of your understanding.
b. If you believe that some essential piece of information is missing, make an appropriate assumption and use it to solve the problem.
c. Write all steps, missing steps may lead to deduction of marks.
d. All coding questions should be answered using the **C** ++ syntax.

You are allowed to use the Dev-C++ compiler to write and test your code. If you do so please remember to copy and paste your code into the examination solution area. **(Do NOT share your code; your colleague could get higher marks than you!!) **WARNING: Please note that Virtual University takes serious note of unfair means. Anyone found involved in cheating will get an `F` grade in this course.**
Total Marks: 40 Total Questions: 3

Question No. 1 Marks : 30
Design and implement a **String** class that makes the following code work properly. The class should store the string in a dynamically allocated memory.

```
int main()
{
String X, Y = "World!";
X = "Hello " + Y;
cout<< X << endl;
return 0;
}
```

Question No. 2 Marks : 05
a. Write the exact type of ***this*** pointer in a ***member function*** of a class **XYZ**. **02**
b. Write three distinct situations in which copy constructor of a class is called. **03**
Answer:
a)

XYZ *this;

b)

1. Assignment of private data members at the time of object creation.

2. When an object is passed by vale to a function.

3. When allocating memory dynamically we use copy constructor to avoid dangling pointer issue.

Question No. 3 Marks : 05

```
class Complex
{
private:
double x,y;
static int z;
public:
Complex(double = 0.0);
friend ostream& operator<<(ostream&, const Complex&);
static int doSomething( ) { z = 2 * y; return z; }
};
```

a. What is wrong in the definition of member function **doSomething( ). 03**

Answer:

Static keyword because using static key word we are declaring a static member function doSomething(). Which can not use non static data members.

b. What will be the effect of writing the friend function **operator<<(…)** in **private** part of the above class? **02**

Answer:

There will be no effect on friend function if we write it in private part. Friend function is a friend function and can use any private or public data member of the class. Where ever we declare it in class body.