

Written Exam

Thursday, January 17th 2008

Duration : 2 hours

All documents are authorized

You can use french or english to answer the questions

Exercise 1 : OOL Basic concepts

- a) What is the difference between inheritance and composition ? *accès direct aux méthodes
accès Private, encapsulé*
- b) What is the difference between a *class* and a *struct* ?
- c) Is C# more similar to Java or to C++ ? justify your answer
- d) What is the output provided by the following C# code ? (write all the lines displayed by this program)

```
class B
{
    public B()
    {
        System.Console.WriteLine("a new B object");
    }

    public virtual void method()
    {
        System.Console.WriteLine("calling B::method()");
    }
}

class D : B
{
    public D:base()
    {
        System.Console.WriteLine("a new D object");
    }

    public override void method()
    {
        System.Console.WriteLine("calling D::method()");
    }
}
```

```

    }
}

public class test
{
    static void Main(string[] args)
    {
        D objd = new D();
        B objb = new D();

        objd.method();
        objb.method();
    }
}

```

e) let the myTh object be an array of threads : (Thread [] myTh = new Thread{5}; for example). All the threads inside myTh are supposed to run the same method, which contains a critical section. How can you ensure that only one thread can access the critical section at one time ? (give an example with C# code).

Exercise 2 : C# Features

- a) Explain how a C# program is compiled and executed
- b) Explain why the foreach statement is so useful with container classes
- c) Why does C# use generic classes (templates) though it provides an *object* class ?
- d) What is a delegation class ? What is a delegate ?
- e) Explain (with or without C# code) how an object can receive an event from another object.
- f) Write a spl class with a private string attribute and a public read-only string property to access the attribute.
- g) Let x be a class inheriting from an Isomething interface. What must you write inside the x class ? what can be written in the Isomething interface ?

Exercise 3 : .NET Features

- a) What is the CLR ?
- b) When do global.asax and web.config files appear in a project ? what is the purpose of each of those files ?
- c) How can you initialize the properties of a component (such as a button, a label, a textbox) ?
- d) What are the benefits of using the ADO.NET object architecture to handle database oriented applications ?