**Philadelphia University**

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**Faculty of Information Technology**

**Department of Software Engineering**

**Examination Paper**

**Lecturer : Ms. Enas Al-Naffar**

**Coordinator : Dr. Samer Hanna**

**Internal Examiner: Dr. Ali Fouad**

**Object-Oriented Programming 721220 Final Exam 2nd semester** **2012-2013**

**Date: 3rd June 2013**  **Section: 1**  **Time**: **120 Minutes**

**Information for Candidates**

1. *This examination paper contains 4 questions. The total is 40.*
2. *The marks for parts of questions are shown in round brackets.*

**I. Basic Notions**

*Objectives: The aim of the question is to evaluate your knowledge and skills concerning with the basic concepts of* ***OOP****.*

**Question 1: [`10 Marks]**

A- Choose the correct answer: [2 Marks, 1 Mark each]

1.  When an object has many forms, it has \_\_\_\_\_.

A)           Inheritance

B)           Scalability

C)           Encapsulation

D)           Polymorphism

2. What part of object-oriented technology defines super-class and sub-class relationships?

A)           Inheritance

B)           Scalability

C)           Encapsulation

D)           Polymorphism

B- Fill in the blanks with the correct answer: [4 Marks, 1 Mark each]

1. A variable known only within the method in which it is declared is called a(n) \_\_\_\_\_\_\_\_.
2. Classes from which objects can be instantiated are called \_\_\_\_\_\_\_\_\_\_ classes.
3. It is possible to have several methods with the same name that each operate on different types or numbers of arguments. This feature is called method \_\_\_\_\_\_\_\_\_\_.
4. Methods in a class that do not provide implementations must be declared using keyword \_\_\_\_\_\_\_\_.

C- State whether each of the following is true or false. If a statement is false, explain why. [4 Marks, 1 Mark each]

1. Base class constructors are not inherited by derived classes.
2. A has-a relationship is implemented via *inheritance.*
3. A Car class has *is-a* relationships with the Steering\_Wheel and Brakes classes.
4. When a derived class redefines a base class method by using the same signature and return type, the derived class method is said to overload that base class method

### II. Familiar Problems Solving

### *Objectives: The aim of the question is to evaluate your basic knowledge of the key aspects of the lectures material and your ability to solve familiar problems.*

**Question 2:** **[15 Marks]**

Study the following class diagram, then write its corresponding c# code.



**Question 3: [8 Marks]**

Study the following class, and then answer the questions below:

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

 class Animal

 {

 protected double weight;

 protected double height;

 protected int x\_coordiantion;

 protected int y\_coordination;

 public animal(double h, double w)

 {

 x\_coordiantion=0;

 y\_coordination=0;

 weight=w;

 height=h;

 }

 public abstract void talk()

 {

 Console.WriteLine("print from the super class");

 }

 public void walk(double x, double y)

 {

 x\_coordiantion=x;

 y\_coordianion =y;

 }

 }

class cat:Animal

{

 private string name;

 public cat(double h, double w) : base()

 {

 name="Putchi";

 }

 public void talk()

 {

 return stirng.format("{0}", "meaw");

 }

 public void drink\_milk()

 {

 Console.WriteLine("iam drinking milk");

 }

}

class test

{

 Animal a = new cat();

 cat c = new cat();

 c.talk();

 c.walk();

 a.talk();

 a.walk();

 a.drink\_milk();

}

The three classes above have some errors . find these erorrs and correct them. **[8 marks]**

***III. Unfamiliar Problems Solving***

Objectives: *The aim of the question is to evaluate your knowledge of the key aspects of the lectures material and your ability to solve unfamiliar problems.*

**Question 4**: **[7 Marks]**

Extend the class **TestShape** in Question 2, by defining a List of type Shape.

* + Create a Method within the same class (**TestShape**) that adds a Shape into the List.
	+ Create a Method within the same class (**TestShape**) that deletes a Shape in a given location ( index)
	+ Use these newly defend methods in the Main method

Good Luck ☺