**Philadelphia University**

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**Faculty of Information Technology**

**Department of Software Engineering**

**Examination Paper**

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**Object-Oriented Programming 721220 First Exam**

**Information for Candidates**

1. *This examination paper contains 4 questions. The total is 20.*
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: [3 Marks, 1 Mark each]**

Answer the following questions:

1. What does it mean for a member of a class to be static?

This member can be accessed using the class name, without the need to create an object

1. What is a namespace?

Set of related classes

1. A book has one or more pages. Which of the following concepts characterize it best?

a. Inheritance

 b. Composition

 c. Association

 d. Specialization

**Question 2:** **[10 Marks]**

* Create a class called "Product", that contains three instance variables :
product\_id , name, expiration\_date. **[3 Marks]**
* Write a method called print that prints the value of the three instance variables. **[ 2 Marks]**
* Create another class called "supermarket" which has the following instance variables: location, owner\_name, List of type Product called PList **[3 Marks]**

* Write a method called Add\_product that adds a new product to PList **[2 Marks]**

**Public class Product**

**{**

 **private int product\_id;**

**private string name;**

**private string date;**

**public void print( )**

**{ Console.WriteLine("{0}, {1}, {2}", product\_id, name , date); }**

**}**

**public class SuperMarket**

**{**

 **private string location;**

 **private string owner\_name;**

 **List< Product> PList = new List<Product>( );**

 **public void Add\_product( Product p)**

**{ PList.Add(P); }**

**}**

### 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 3: [4 Marks]**

Study the following class, then answer the questions below:

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

public class Number

{

 public int x;

 public int y;

 public const int z = 0;

 public Number(int x, int y)

 {

 this.x = x;

 this.y = y;

 }

 public void sum(double no1, double no2)

 {

 double s = x + no1 + no2;

 Console.WriteLine("x= {0}, s={1}", this.x, s);

 }

 public void sum(int no1, int no2)

 {

 int x = 10;

 int s = this.x + no1 + no2;

 Console.WriteLine("{0}", s);

 }

 public static void Main()

 {

 Number n = new Number(6, 2);

 n.z= 9;

 n.x = 7;

 n.sum(9 , 10);

 }

}

1. The Main method conatins an error. Try to locate that error and correct it. **[2 marks]**

n.z=9 🡪 z is a constant, so it can't be assidned a new value

Correction: we can remove const keyword.

1. What is the output of the last statement? **[2 marks]**

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***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**: **[3 Marks]**

Extend the class in *Question 2* by adding a method called *Random\_print( )* that selects a product randomly and prints out its details

public void Random\_print( )

{

 Ransom r =new Random( );

 int i= r.Next( PList.capacity);

 Product c= PList[i];

 c.Print( );

}

Good Luck ☺