

Winter 2019 – 1st In-semester Examination

IT602 – Object Oriented Programming

ID:

Name:

Max Marks: 20

Time: 90 mins

Instructions:

1. All questions are compulsory.
2. Marks carried by each question are mentioned alongside the question.
3. The answers are to be written on the question paper itself in space provided below every question.
4. Supplementary sheet provided is only for rough work and should NOT be attached to the question paper.
5. No queries / clarifications are entertained. If you have any doubt about a question, try to the best of your understanding.

Q1.

(3)

The code written in Main() function below outputs the following output. Complete the following code including the definition of class which will result in this output (without hardcoding the values).

Output:

The sum of 10 and 20 is 30

Code:

```
using System;
class Program
{
    static void Main(string[] args)
    {
        int a = 10, b = 20;
        int sum = Calculator.AddNums(a, b);

        /* fill in the blank below*/

        string output = .....

        Console.WriteLine(output);
    }
}
```

```
/* define the class here*/
```

Q2.

(1)

What is the output of following program (assume it works).

```
using System;
class Program {
    static void Main(string[] args) {
        string s = "hello world";
        s.Replace('o', 'i');
        s.Replace("r", string.Empty);

        Console.WriteLine(s);
    }
}
```

```
/*write your answer in the space below*/
```

Q3.

(1)

Modify the code block below (represented by the comment) so that it will throw error at runtime if data overflow occurs.

```
class Program
{
    static void Main(string[] args)
    {

        /*
         * code block with lots of number calculations
         */

    }
}
```

Q4.

(2)

Re-write the following code replacing the type declaration(s) with var keyword such that the program continues to compile without errors.

<pre>class KnowVar { int _m = 10; public void MyMethod(int i, int j=10) { int k = i + j; string sum = "The sum"; int n; string mul; n = i * j; mul = "The multiplication"; KnowVar ob = new Program(); KnowVar ob2 = null; } }</pre>	<pre>/* write your answer below */</pre>
--	--

Q5.

(3)

Complete the function AnArray() in the following program. The code in the function should create an array. The 1st element of this array should have integer 10 as its value, the 2nd element should have boolean false as its value, the 3rd element should store reference to a DateTime object (use new DateTime(2019,01,01) to create the object). And, the 4th element of the array should have string "sample string".

Write foreach loop in the same function to print the elements of the array.

```
class Q5
{
    static void AnArray()
    {
        /*your answer goes here*/
    }
}
```

```
}    }  
}
```

Q6.

(3)

Write code to define a class Point that has:

- a) Two read-only automatic public properties X and Y that return int.
- b) A public constructor that takes two integers x and y as parameters and assigns them to the X and Y properties (read-only properties can be assigned values in the constructor).
- c) A public function Deconstruct that returns a tuple containing two integer values of X and Y

Q7.

(7)

Following table has information about two products to be sold to customers coming to a grocery shop:

Product	Wholesale Cost	Tax	Profit margin
Wheat 5kg Bag	150	5	50
Refined Oil 5Kg	280	10	70

Based on content covered in our lectures of this course, design and implement an elegant solution such that the following Main() function outputs Total Bill = 770 when a customer purchases two wheat bags and one refined oil 5kg bottle. Note that cost price of the item is sum of Wholesale price, Tax and Profit margin.

Instructions / help:

1. Write separate functions to return cost of each type i.e. WholesaleCost(), Tax() and Profit() so that the item's cost price will be WholesaleCost()+Tax()+Profit().
2. The class Biller should not see the detail of how cost price of the item is calculated. All it does is to iterate over the items in the shopping cart to get their cost prices and return the total bill amount i.e. the sum of the cost prices of items in the shopping cart.
3. No modification of class Buyer is allowed (other than to fill in the blank)

```
class Buyer
{
    static void Main(string[] args)
    {
        var shoppingCart = new .....[3]; // fill this as per your solution
        shoppingCart[0] = new Wheat5kgBag();
        shoppingCart[1] = new Wheat5kgBag();
        shoppingCart[2] = new RefinedOil5kg();

        Biller biller = new Biller();

        float totalBill = biller.CalculateTotalBill(shoppingCart);

        Console.WriteLine($"Total Bill = {totalBill}");
    }
}

/* write rest of the code below */
```