HARARE INSTITUTE OF TECHNOLOGY

SCHOOL OF INFORMATION SCIENCES AND TECHNOLOGY

B.TECH (HONS) DEGREE IN INFORMATION TECHNOLOGY

B.TECH (HONS) DEGREE IN SOFTWARE ENGINEERING

B.TECH (HONS) DEGREE IN COMPUTER SCIENCE

B.TECH (HONS) DEGREE IN INFORMATION SECURITY AND ASSURANCE

IIT1201/ISE1201/ICS1201/ISS1201:

VISUAL PROGRAMMING

IIT122/ISE122/ICS122/ISS127:

VISUAL PROGRAMMING CONCEPTS AND DEVELOPMENT

TIME: 3 HOURS **DATE: MAY/JUNE2023**

TOTAL MARKS: 100

INSTRUCTIONS TO CANDIDATES:

- *This question paper contains a total of **FIVE** questions.*
- *Each question carries **25** marks*
- *Answer **any FOUR** questions*
- *Start a new question on a fresh page*
- *Use C# only to answer programming questions*

ADDITIONAL MATERIAL:

- *None*

QUESTION 1

a. Describe the main components of the .NET Framework. **[10]**

b. Differentiate a console application from a windows application. **[6]**

c. Write a program that stores 200 random numbers in a text file. The random numbers should be positive with the largest value being 50. Your program should store ten numbers per line. Use the Random class to generate the values. Include appropriate exception-handling techniques in your solution. **[9]**

QUESTION 2

a. The computer club is selling T-shirts. Create an attractive user interface that allows users to select sizes (S, M, L, and XL) and quantity. Include two more sizes, XSmall and XXLarge. Add statements that process the order by calculating the total cost. Each shirt is $16 except the XSmall and XXLarge; their specialty prices are $20.00 each. Allow users to purchase different sizes on the same order. Display the selections made by the user with the Purchase Button. Include a button to exit the application. **[10]**

b. Given the following program segment, answer questions i through v.

```
public class Student
{
//Data members, data fields, or characteristics
      private string sNumber;
      private string sName;
      private int score1;
      private int score2;
      private int score3;
      private string major;

// default constructor

//constructor with two argument (sNumber and sName)

//constructor with all data fields as argument

//Define properties for sNumber.

}
```

i. Define a default Constructor. **[2]**

ii. Define a constructor with two arguments namely, sNumber and sName. **[2]**

iii. Define a constructor with all data fields as arguments. **[2]**

iv. Define properties for sNumber. [3]

v. Instantiate an object using a constructor with 2 arguments, initialize the parameters and display the output. [6]

QUESTION 3

a. Differentiate a jagged array from a rectangle array with aid of examples. [8]

b. State and explain any three events in C# [6]

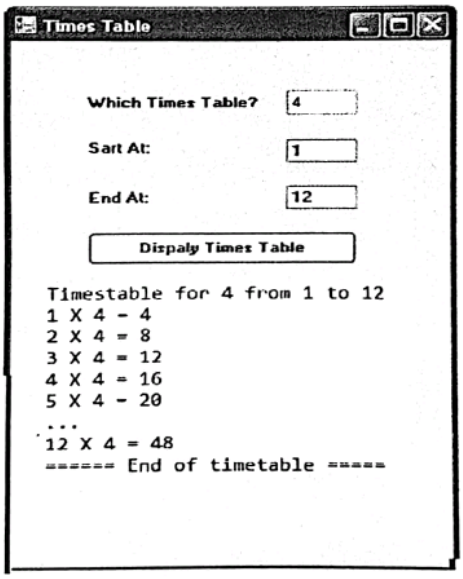
c. Write a program to calculate the average of all scores entered between 0 and 100. Use a sentinel-controlled loop variable to terminate the loop. After values are entered and the average calculated, test the average to determine whether a 1, 2.1, 2.2, P, or F should be recorded. The scoring rubric is as follows:

A—75-100; B—65-74; C—55-64; D—45-54; F < 45. [9]

d. What do you understand by implicitly typed variable? [2]

QUESTION 4

a. Write a Timestable program which does the following:



i. Allow the user to input the following variables through text boxes [3]

- any number num
- starting number `start_num`
- end number `end_num`

ii. Use any appropriate loop to multiply `num` with numbers from `start_num` to `end_num` and display the computations in a list box as shown on the fig above. [6]

b. Explain how instance methods differ from class methods. What differ when invoking each different type? [6]

c. Using the following declaration:

```
int [ ] iProduct = new int [10];
```

i. Write a foreach loop to display the contents of iProduct. [3]

ii. Use a member of the Array class to locate the index in the iProduct array where 56 is stored. [3]

c. Differentiate between the following functions:

i. `Write()` and `WriteLine()` [2]

ii. `Read()` and `ReadLine()` [2]

QUESTION 5

a. Differentiate ref and out parameters with the aid of examples. [6]

b. Write a program that connects to a MS SQL Server database named Employees which residing on a server called NitroCo. Assume the user is **`Admin`** and the password is **`pass`**. Connection timeout is 10 seconds. [9]

c. Define exception handling with the aid of an example. Your example must illustrate the use of all the blocks used in exception handling. [6]

d. Differentiate boxing from widening in terms of primitive type and reference types. [4]

END OF EXAMINATION PAPER