Mansoura University- Faculty of Engineering		Department: Computers Engineering And Systems Total Marks: 20 Marks	BMEProgram MTE Program

Course Title: Introduction to Data Structure and Algorithm — Mid Term

Date: Apr 2019 (Second term) — Allowed time: 60 Mins — No. of Pages: (1)

Problem number (1) (12 Marks)

Q1-A) What is meant by computer program, then state the factors that effect on its running time

Q1-B) Write a C# program that accept a 2-D array, the output of the program is largest value located at the diagonal.

Q1-C) Assume that you have four variable HE- SHAM – ARA – FAT ; Write (using C#) a piece of code That declare the first variable as an 2 D array Data structure, the second as an List Data structure. Then (i) initialize each of them by any value (ii) Apply three suitable methods for each (iii) Write the statement that helps in printing the contents of each of them

Q1-D) State the (similarities/ differences) between the following pairs

(Program and Application) – (Program and Algorithm) – (Array ADT and List ADT) – (Flow Chart and Algorithm) -

Q1-E) Give 3 example of recent applications that use computer in your field?

Q1-F) List 5 methods C# offers to deal with Array ADT, repeat the question for 3 method for list, for each method explain (its function and example)

Problem number (2) (12 Marks)

Q2-A) (i) Find the output of the following Three Pieces of code

Then (ii) **write a piece of code using C# to write an equivalent program**

I

```
using System;
using System.Collections.Generic;
public class MainClass {
    public static void Main() {
      string[] presidents = {"HE", "SH", "AM",
            "Ar", "af", "at"};
        string name = presidents.Last();
        Console.WriteLine(name);
    }
```

II

```
using System;

class Program
{
    static void Main()
    {
        string[] elements = { "cat", "dog", "fish" };
        Console.WriteLine(elements[0]);

        // ... Join strings into a single string.
        string joined = string.Join("|", elements);
        Console.WriteLine(joined);

        // ... Separate joined strings with Split.
        string[] separated = joined.Split('|');
        Console.WriteLine(separated[0]);
    }
}
```

III

```
using System;
using System.Collections.Generic;

class Program {

    static void Main() {

        LinkedList<string> myList = new LinkedList<string>();

        // Add 6 elements in the linked list
        myList.AddLast("P");
        myList.AddLast("Q");
        myList.AddLast("R");
        myList.AddLast("S");
        myList.AddLast("T");
        myList.AddLast("U");

        LinkedListNode<string> node = myList.Find("R");
        myList.AddAfter(node, "ADDED");

        foreach (var i in myList) {
            Console.WriteLine(i);
        }
    }
}
```

Best wishes — Prof. Dr Hesham Arafat