

**Question No. (1) (14 Marks) two points each**

- Q1-A)** In the Visual Studio; How to set a breakpoint and how to run to that breakpoint?
Q1-B) What are the kinds of errors that can be detected by a program during compile time?
Q1-C) Compare between Nested if statements and switch statement
Q1-D) Which class is at the top of .NET class hierarchy?
Q1-E) What is the syntax to inherit from a class in C#?
Q1-F) Briefly explain the difference between an instance variable and a class variable.
Q1-G) How can you check to see if a number is less than 0 using only == and the bit operators

Question No. (2) (30 Marks)**Q2-A)** (5 points) Which of the following statements is **not valid**?

PrintSign(-5); PrintSign(balance); PrintSign(2+3); PrintMax(100, 200);
 PrintMax(oldQuantity * 1.5, quantity * 2);

Q2-D) (3points each) **If there is no error** For the following code Find the output

```
(I) using System;
struct Point
{
    public int x, y;
    public Point(int x, int y) {
        this.x = x;
        this.y = y;
    }
}
public class Tester
{
    public static void Main()
    {
        Point a = new Point(10, 10);
        Point b = a;
        a.x = 100;
        System.Console.WriteLine(b.x);
    }
}
```

```
(II) using System;
public class Tester
{
    public static int Main( )
    {
        for (int i=0;i<100;i++)
        {
            Console.Write("{0} ", i);
            if (i%10 == 0)
            {
                Console.WriteLine("\t{0}", i);
            }
        }
        return 0;
    }
}
```

```
(III) using System;
class Values
{
    static void Main( )
    {
        int valueOne = 10;
        int valueTwo;
        valueTwo = valueOne++;
        Console.WriteLine("After postfix: {0}, {1}",
            valueOne,
            valueTwo);
        valueOne = 20;
        valueTwo = ++valueOne;
        Console.WriteLine("After prefix: {0}, {1}",
            valueOne,
            valueTwo);
    }
}
```

```
(IV) using System;
class Values
{
    static void Main( )
    {
        int valueOne = 10;
        int valueTwo = 20;
        int maxValuE = valueOne > valueTwo ?
            valueOne : valueTwo;
        Console.WriteLine("ValueOne: {0},
            valueTwo: {1}, maxValuE: {2}",
            valueOne, valueTwo, maxValuE);
    }
}
```

Q2-B) (5 points) Add logical connection among the following various constants

WickedCold = 0, FreezingPoint = 32, LightJacketWeather = 60,
SwimmingWeather = 72, BoilingPoint = 212

Q2-C) (8 points) Given an array scores of doubles, write a program that compute the sum of all elements in the array; store the result in variable total. Write one program using while loop; Write another program using for loop

Question No. (3) (30 Marks)

Q3-A) (5 points) Rewrite the following statement by using foreach flow control statement

using System;

public class PrintChars1

{ public static void Main()

{ Console.WriteLine("Please type a string: ");

string text = Console.ReadLine();

for (int index = 0; index < text.Length; index = index + 1)

{ char c = text[index];

Console.WriteLine(c);

}

}

Q3-B) (3points) Write a boolean expression that checks for given integer if it can be divided (without remainder) by 7 and 5 in the same time.

Q3-C) (6 points) Write a method "PrintMax " that accept two values and print the biggest?

Q3-D) (10 points) For the following code (i) Find the output by assuming any data (ii) Modify it to print the results with specific header such as "Ahamad, Hesham, Saad, Nesma"

```
public class Votes {
```

```
public static void Main()
```

```
{
```

```
int[] votes = {0, 0, 0, 0};
```

```
bool processing = true;
```

```
// collect the votes:
```

```
while ( processing )
```

```
{ Console.WriteLine("Type your vote (0,1,2,3): ");
```

```
int v = Int32.Parse(Console.ReadLine());
```

```
if ((v < 0) || (v > 3))
```

```
{ processing = false; } // bad vote, so quit
```

```
else
```

```
{ votes[v] = votes[v] + 1; }
```

```
}
```

```
for ( int i = 0; i != votes.Length; i = i + 1 )
```

```
{ Console.WriteLine("Candidate " + i + " has "
```

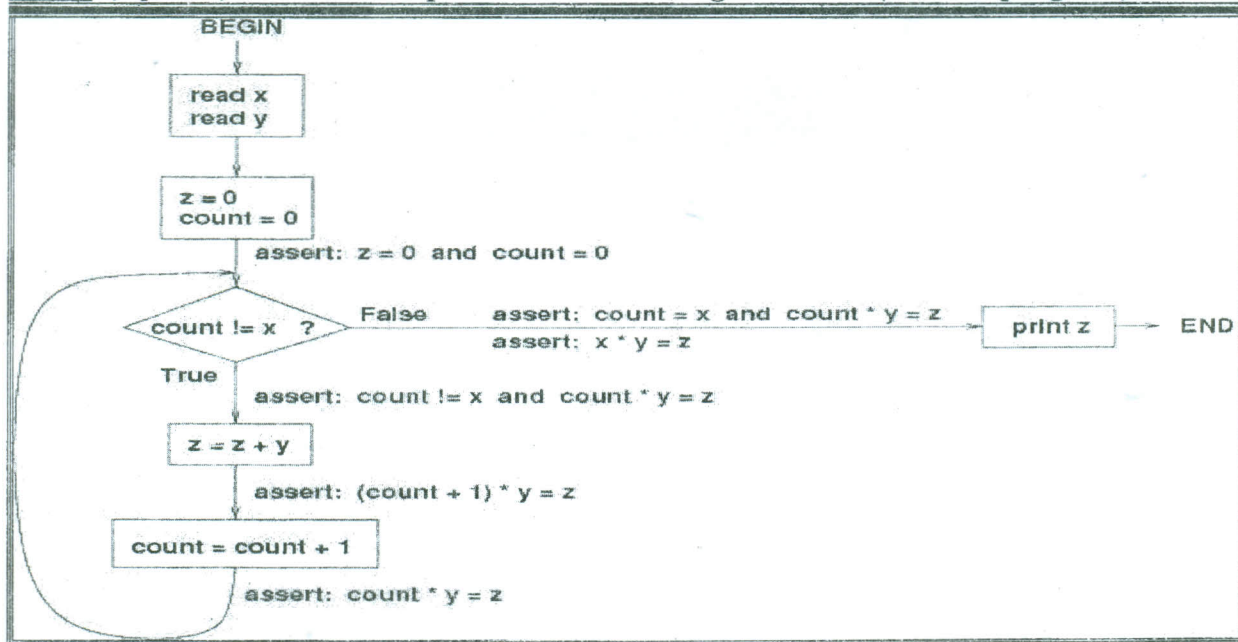
```
+ votes[i] + " votes");
```

```
}
```

```
}
```

```
}
```

Q3-E) (7 points) Use C# to implement the following flowchart (Write a program)



Question No. (4) (38 Marks)

Q4-A) (8 points) Write the code to calculate and return the arithmetic, geometric and harmonic means of the given array in their place holders.

Arithmetic mean of $x_1, x_2, x_3, \dots = (x_1 + x_2 + x_3 + \dots)/n$

Geometric mean of $x_1, x_2, x_3, \dots = (x_1 * x_2 * x_3 \dots)$ raised to the power $(1/n)$

Harmonic mean of $x_1, x_2, x_3, \dots = n/(1/x_1 + 1/x_2 + 1/x_3 + \dots)$

Q4-B) (12 points) For a given set of names (“Ahly”, “Zamalek”, “Ismaelly”, “Enby” Masry”), Write a C# program that declare these name as a string array , then print them in an alphabetically ascending order, then print “hoping that will be the order by the end of the league”

Q4-C) (18 points) Write a C# program that Simulate projectile motion on earth [for 10 seconds] – (Cannon ball exits the cannon at position (0,0)- Ask user for initial velocity - Report the position of the cannon ball every second) : Use the following facts

(SX: displacement in the X direction can be calculated as) $s_x = s_x + 0.5 a_x t^2 + v_x * t;$

(SY: displacement in the Y direction can be calculated as) $s_y = s_y + 0.5 a_y t^2 + v_y * t;$

(VX velocity on the x direction can calculated as) $v_x = v_x + a_x * t;$

(VY velocity on the Y direction can calculated as) $v_y = v_y + a_y * t;$

