UNIVERSITY OF RUHUNA

BACHELOR OF SCIENCE (GENERAL) DEGREE

LEVEL III (SEMESTER II) EXAMINATION – NOVEMBER/DECEMBER 2016

COURSE UNIT: COM 323α – Visual Programming   Duration: 2 hours

Answer **four** questions **only**

1) Write Visual Basic code segments to perform following tasks.

   a) Suppose you have two text boxes in a form with names *TextBox1* and *TextBox2*. The contents of the two text boxes should be swapped.

   b) There is a text box in a form with the name *TextBox1*. The user can enter a number into the text box. The number should be multiplied by 10 and replaced the original number.

   c) There are three checkboxes in a form with the names: *CheckBox1*, *CheckBox2*, and *CheckBox3*. The user may check any number of checkboxes out of these three. A message box should be displayed with the texts of selected checkboxes separated by new lines.

   d) There are three radio buttons in a form with the names: *RadioButton1*, *RadioButton2*, and *RadioButton3*. The user may select one of these radio buttons. There is a label on the form with the name *Label1*. If user selects a radio button, the text of the selected radio button should be displayed in the label.

   e) There is a label with the name *Label1* in a form. The label initially displays zero. The displayed value should be incremented by one per each click of the left mouse button on the form. The click of the right mouse button on the form resets the text of the label to zero. Write the entire subroutine.

2)

   a) Convert following *for* loop into *do while* loop using a Visual Basic code segment.

```
For x = 3 To 10
      MessageBox.Show(x.ToString())
Next
```

b) **Table 1** shows relevant grades based on marks. Write a Visual Basic code segment to compute the grade for a given marks. The grade should be displayed in a message box.

Table 1

Marks range	Grade
$70 \leq marks$	A
$50 \leq marks < 70$	B
$20 \leq marks < 50$	C
$marks < 20$	F

c) The coordinates of a point on a form are given by (x, y). The gradient of the point can be defined as y/x; where x is not equal to zero. Either left-clicking or right-clicking on the form, the gradient of the clicked point should be displayed in a message box. An appropriate message should be displayed if the gradient cannot be computed. Write a Visual Basic code segment for the entire subroutine.

d) Decide the final values of the variables *x* and *y* after executing the program given below.

```
Dim x As Integer = -1
Dim y As Integer = 5
While x + y <= 28
    For i As Integer = 3 To 5
        x = i + 4
    Next i
    y = y + 1
End While
```

3)

a) Use *Open File Dialog* control with the name *openFD* to read a file and display its path in a message box. The title of the dialog should be "Opening an Image". Initially the content of the directory *D* should be displayed when trying to open a file. Add a filter for *JPEG* images, *BMP* images, and *GIF* images. Write a Visual Basic code segment.

b) Suppose there is a combo box in a form with following list of items: *One, Two,* and *Three*. Write a Visual Basic code segment to display the corresponding numerical value of the selected item of the combo box using a message box. E.g. If "Two" is selected then "2" should be displayed. Use *Select Case Statements*.

c) There is a text box with the name *TextBox1* in a form. The user can enter an integer into that text box. An integer array should be declared in which the number of elements equals to that integer given by the user. Each element in the array should be set equal to the index of that element. Write a Visual Basic code segment.

d) A form contains a text box and two list boxes with the names *TextBox1*, *ListBox1*, and *ListBox2* respectively. In addition to them, there is a button on the form. Write a Visual Basic code segment to read an integer from the text box and if the integer is positive it should be included to the *ListBox1* else it should be included to the *ListBox2*.

e) There is a rich text box with the name *rtbInfo* in a form. You have a text file inside directory *D* named *info.txt*. Write a Visual Basic code segment to read this text file into the rich text box. Note that you have to handle exceptions.

4)

a) Write Visual Basic code segments to perform following tasks.

    i. Declare a three dimensional integer array with the size 4×4×4 and initialize all its elements to zero.

    ii. Set the array elements to one when the three indices are equal in the array in (4) (a) (i) above. **Hint:** IF i = j = k THEN SET x (i, j, k) TO 1.

    iii. Assume that each element in the array mentioned in (4) (a) (i) above was initialized by a random number. Compute the sum of all elements in the array.

b) The user has to specify the number of rows and the number of columns of a two dimensional array. Then the elements of the array should be initialized by random integers between 1 and 6. The generated array should be displayed.

    i. Design an appropriate graphical user interface to handle the problem.

    ii. Write a Visual Basic code segment to solve the problem.

5)

a) Briefly explain the array data structure in computer programming.

b) Briefly explain the three types of errors in computer programming by using a suitable example per each.

c) **Figure 1** shows a graphical user interface which can be used to view the elements stored in an array. The names of the controls are given in the figure. The read-only text box *txtN* displays the index and read-only textbox *txtV* displays the corresponding element of that index. The two buttons: *btnL* and *btnR* are used respectively to navigate backward and forward the array. The two buttons should be disabled and enabled accordingly so that the array does not go out of range. Initially the content of the zeroth index should be displayed.
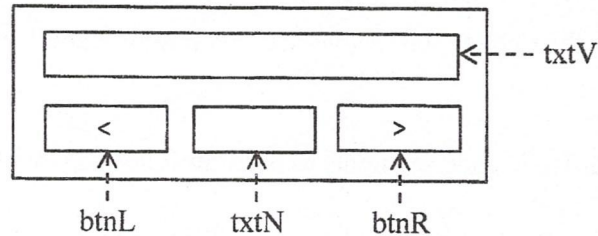

Figure 1

Complete the Visual Basic code given below by writing appropiate code segments for CODE SEGMENT 1, CODE SEGMENT 2, and CODE SEGMENT 3.

```
Public Class Form1

    Dim s() As String = {"Maths", "Chemistry", "Physics"}
    Dim n As Integer = 3
    Dim i As Integer = 0

    Private Sub btnR_Click(sender As Object, e As EventArgs)
Handles btnR.Click
        ' CODE SEGMENT 1
    End Sub

    Private Sub btnL_Click(sender As Object, e As EventArgs)
Handles btnL.Click
        ' CODE SEGMENT 2
    End Sub

    Private Sub Form1_Load(sender As Object, e As EventArgs)
Handles MyBase.Load
        ' CODE SEGMENT 3
    End Sub

End Class
```