



# SLIATE

**SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION**

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

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## **Higher National Diploma in Information Technology**

**Second Year, First Semester Examination – 2017**

**HNDIT2311- Rapid Application Development**

### **Marking Scheme**

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1)

- a) Give four (04) characteristics of rapid application Development. [04 Marks]

- **RAD uses hybrid teams**
- **RAD Uses specialized tools**
- **RAD uses “Timeboxing”**
- **RAD uses iterative, evolutionary prototyping**

**Or Any acceptable answers**

- b) Briefly explain the term “Classic Mistakes”. [03 Marks]

**Some ineffective development practices have been chosen so often, by so many people, with such predictable, bad results that they deserve to be called "classic mistakes.**

**Or Any acceptable answer**

- c) Give four (04) categories of “Classic Mistakes”. [04 Marks]

- **People related**
- **Product related**
- **Technology related**
- **Process related**

- d) What do you mean by term “Commercial Off-the-Shelf” (COTS) based development.

Give the advantage of COTS based development rather than other traditional development.

[05 Marks]

**COTS mean software or hardware products that are ready-made and available for sale to the general public. For example, Microsoft Office is a COTS product that is a packaged software solution for businesses.**

**COTS based approach reuses components that are complete application systems.**

**A prototype can be created by linking a database, a word processor, a spreadsheet, and written code to find relationships between the requirements**

**Advantage of this approach:**

**A lots of application functionality can be implemented quickly at a very low cost.**

*03 Marks for explanation , 02 Marks for the advantage*

- e) Briefly explain when it is more suitable to use rapid application development.

**How well the customer and the client understand the requirements at the beginning**

**Level of awareness about the system architecture**

**Amount of reliability**

**Less time**

[04 Marks]

**[Total Marks 20]**

2)

- a) Write three (03) properties of variable. [03 Marks]

- **Name** - reference to the location - **cannot be changed**
- **Value** - the information that is stored - **can be changed** during program execution, hence the name “variable”
- **Data Type** - the type of information that can be stored - **cannot be changed**

- b) Give three (03) rules you follow when you define a variable? [03 Marks]

- **Variable MUST be declared prior to the code where they are used**
  - **Variable should be declared first in the procedure (style convention)**
  - **Declaring an initial value of the variable in the declaration statement is optional**
  - **Variable must be a single word**
- Or any acceptable answer**

- c) What is the difference of implicit type conversion and explicit type conversion? [04 Marks]

**A value of one data type can be assigned to a variable of a different type**

- **An implicit type conversion is an attempt to automatically convert to the receiving variable’s data type**

- VB provides a set of functions that perform data type conversions. These functions will accept a literal, variable name, or arithmetic expression. That is explicit type conversion.

d) Following interface has been created to register student for SLIATE examination.

Category	Control	Property	Value
Label	lblName	Name	lblName
		Text	Name
	lblAti	Name	lblAti
		Text	ATI/ATI Section
	lblSex	Name	lblSex
		Text	Sex
	lblDob	Name	lblDob
		Text	Date of Birth
	lblAge	Name	lblAge
		Text	Age
Text box	txtName	Name	txtName
		Text	Name
MaskedTextBox	masktxtRegno	Name	masktxtRegno
		Mask	\A\MP/IT/2\0\17/F/0000
DateTimePicker1	dtpDob	Name	dtpDob
Radio Button	radMale	Name	radMale
		Text	Male
		checked	True
	radFemale	Name	radFemale

		Text	Female
		checked	False
Combo Box	cmbAti	Name	cmbAti
		Items	Ampara Anuradhapura Badulla Baticaloa
List Box	lstDetails	Name	lstDetails
		text	
Button	btnSubmit	Name	btnSubmit
		Text	Submit

Fill in the blanks (1 to 10) of following source code considering above form and table.

```

Dim name As String
Dim ati As String
Dim sex As String
Dim dob As (1)Date [01 Marks]
Dim age As (2)Integer [01 Marks]
Dim regno As String

name = (3)txtName.text [01 Marks]
ati = (4)cmbAti.SelectedItem [01 Marks]
If radMale.(5)Checked=true Then [01 Marks]
    sex = "Male"
ElseIf RadFemale.(6) Checked=true Then [01 Marks]
    sex = "female"
End If
dob = (7)dtpDob.text [01 Marks]
age = (8)txtAge.text [01 Marks]
regno = (9) masktxtRegno.Text [01 Marks]
(10) lstDetails.Items.Add ("Student Information") [01 Marks]
..... ("-----")
..... ("Student Name :" & name)
..... ("ATI/ATI Section :" & ati)
..... ("Sex :" & sex)
..... ("Date of Birth:" & dob)
..... ("Age :" & age)
..... ("Reg Number :" & regno)

```

**[Total Marks 20]**

3)

- a) Give four (04) control structures available in VB.NET for repetitions. [04 Marks]

**Do while, Do until, For, While**

- b) Write a Visual Basic code (Windows Application) to find the factorial value of any given number using input box and display in textbox. [05 Marks]

*Hint : factorial of 4 is  $4 \times 3 \times 2 \times 1 = 24$*

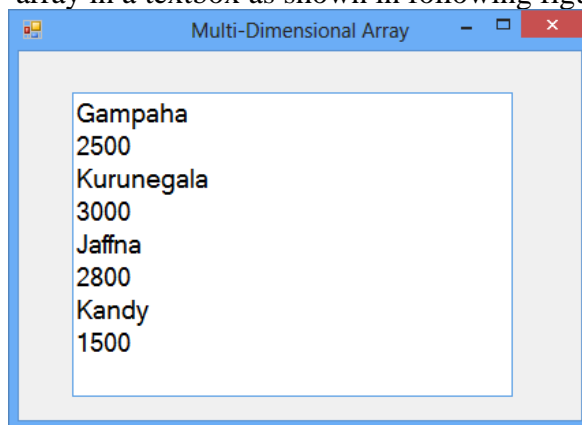
```
Dim a, f As Integer
f = 1
a = Val(TextBox1.Text)
For i = 1 To a
    f = f * i
Next i
TextBox2.Text = f
End Sub
```

- c) Write VB.Net array declaration for a multi-dimensional array to keep following data. [04 Marks]

ATI Name	No of Student
Gampaha	2500
Kurunegala	3000
Jaffna	2800
Kandy	1500

```
Dim ati(,) As String = {{ "Gampaha", 2500}, {"Kurunegala", 3000}, {"Jaffna", 2800}, {"Kandy", 1500}}
```

- d) Write a VB.Net code segment to display the content of above multidimensional array in a textbox as shown in following figure. *Hint: use for loop* [05 Marks]



```

Dim m,n As Integer
    m = 0
    n = 0

    For m = 0 To 3 Step 1
        For n = 0 To 1 Step 1

            TextBox1.Text = TextBox1.Text & ati(m, n) & vbCrLf
        Next n
    Next m

```

- e) What is the method available in VB.NET to take total number of elements in all dimensions? [02 Marks]

**Arrayname.length**

**[Total Marks 20]**

4)

a) Write the syntaxes for VB.NET function and sub procedure.

[04 Marks]

**Public Sub *SubName* (*parameterName* As *DataType*)**

***/\*procedure code***

**End Sub**

**Public Function *FunctionName* (*parameterName* As *DataType*)**

***As returnType***

***/\* function code***

**Return *Value* */\* OR FunctionName = Value***

**End Function**

b) What is the difference between passing by Value and passing by reference? Give an example for each.

[04 Marks]

**Arguments are usually passed *ByVal***

**A copy of the value of the argument is stored in the parameter location**

**Any changes in that value made by the called procedure are made only to the parameter location – original argument from calling procedure will not change**

**Public sub add (byval a, byval b)**

**End sub**

**Arguments (variables) can also be passed *ByRef***

**The reference (memory location) of the variable used as the argument is stored in the Parameter location**

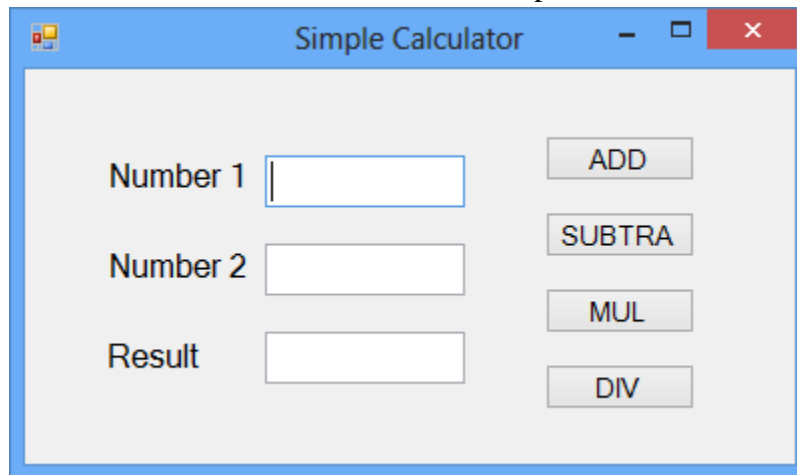
**Parameter references (points to) the original variable's (argument's) memory location**

**Any changes made by the called procedure are made to the original variable (argument) from calling procedure**

**Public sub add (byref a,byref b)**

**End sub**

c) Write suitable VB.NET functions or sub procedures for the following interface.

A screenshot of a Windows application window titled "Simple Calculator". The window has a blue title bar with standard minimize, maximize, and close buttons. The main area is light gray and contains three text boxes on the left and four buttons on the right. The text boxes are labeled "Number 1", "Number 2", and "Result". The buttons are labeled "ADD", "SUBTRA", "MUL", and "DIV".

i. Addition of two numbers.

[03 Marks]

```
Friend Function add(ByVal a As Integer, ByVal b As Integer)
    Dim c As Integer
    c = a + b
    Return c
End Function
```

ii. Subtraction of two numbers.

[03 Marks]

```
Public Function subtract(ByVal a As Integer, ByVal b As Integer)
    Dim c As Integer
    c = a - b
    Return c
End Function
```



iii. Multiplication of two numbers.

[03 Marks]

```
Public Function mul(ByVal a As Integer, ByVal b As Integer)
    Dim c As Integer
    c = a * b
    Return c
End Function
```

iv. Division of two numbers.

[03 Marks]

```
Public Function div(ByVal a As Integer, ByVal b As Integer)
    Dim c As Integer
    c = a / b
    Return c
End Function
```

[Total Marks 20]

5)

a) Consider the following two programs and answer the questions given below.

#### Program A

```
Public Class Form4

    Private Sub Button1_Click(ByVal sender As System.Object,
ByVal e As System.EventArgs) Handles Button1.Click
        Dim objv As New Toyota
        objv.drive("Driving a Toyota Car....")

    End Sub
End Class

Public Class vehicle
    Public Sub drive()
        MsgBox("Driving a Car .....")
    End Sub
End Class

Public Class Toyota
    Inherits vehicle
    Public Overloads Sub drive(ByVal text As String)
        MsgBox(Text)
    End Sub
End Class
```

## Program B

```
Public Class Form4

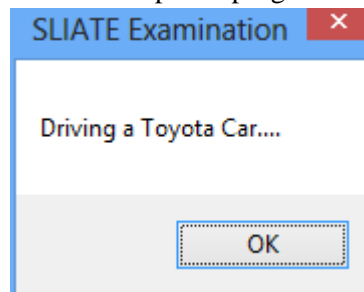
    Private Sub Button1_Click(ByVal sender As System.Object,
ByVal e As System.EventArgs) Handles Button1.Click
        Dim objv As New Toyota
        objv.drive()
    End Sub
End Class

Public Class vehicle
    Public Overridable Sub drive()
        MsgBox("Driving a Car .....")
    End Sub
End Class

Public Class Toyota
    Inherits vehicle
    Public Overrides Sub drive()
        MsgBox("Driving a Toyota Car....")
    End Sub
End Class
```

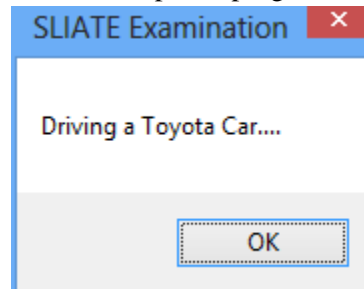
i. What will be the output of program A?

[02 Marks]



ii. What will be the output of program A?

[02 Marks]



iii. What are the object oriented concepts use in above programs? Briefly explain it.

[04 Marks]

**Inheritance**

**Polymorphisem**

iv. Briefly explain the difference of overloading methods and overriding methods.

[04 Marks]

**Overloading occurs when two or more methods in one class have the same method name but different parameters.**

**Overriding means having two methods with the same method name and parameters (i.e., method signature). One of the methods is in the parent class and the other is in the child class.**

b) Write a class called "Cal" for calculate followings.

[08 Marks]

- i. Take addition of two numbers
- ii. Take power ( $x^2$ ) of a number
- iii. Take reminder of two numbers

```
Public Class cal
    Friend Function add(ByVal a As Integer, ByVal b As Integer)
        Dim c As Integer
        c = a + b
        Return c
    End Function
    Public Function power (ByVal a As Integer, ByVal b As Integer)
        Dim c As Integer
        c = a ^ b
        Return c
    End Function
    Public Function reminder(ByVal a As Integer, ByVal b As Integer)
        Dim c As Integer
        c = a Mod b
        Return c
    End Function
End class
```

- 6) Consider following interface and answer the following interface.

- a) Write the code segment for creating a database connection for above form with the SQLServer Database. [05 Marks]

*Hint: Data Source=SLIATE; Initial Catalog=Lecturer(database name);Integrated Security=True*

*Table Name :lecturerTB*

```
Dim cn As New SqlConnection("data source=jeeecom;initial
catalog=lecturer;integrated security=true")
Dim da As New SqlDataAdapter("SELECT * from lecturerTB", cn)
Dim ds As DataSet = New DataSet("lecturerTB")
```

- b) Write the code segment to insert a record into the database. (Add Button)

[05 Marks]

```
Dim name As String
Dim nic As String
Dim sex As Char
Dim status As String
Dim age As integer
Dim dob As Date
Dim dateofbirth As String
Dim course As String
```

```

        name=textBox1.text
        nic=Cint(textBox2.text)

    If RadioButton1.Checked = True Then
        sex = "M"

    ElseIf RadioButton2.Checked = True Then
        sex = "F"
    End If
    Age=Cint(textBox3.text)
    status = ListBox1.SelectedItem

    dob = CDate(DateTimePicker1.Text)
    course=comboBox1.SelectedItem

    cn.Open()
    Dim cmsql As New SqlCommand
    cmsql.Connection = cn
    cmsql.CommandText = "INSERT INTO lecturerTB VALUES ('" &
name & "','" & nic & "','" & sex & "','" & status & "','" & age & "','" & dob & "','" & course & "')"

    cmsql.ExecuteNonQuery()
    da.Fill(ds)
    cn.Close()

```

- c) Write the code segment to update the status of a lecturer who has NIC number 80818448. (Update Button). [05 Marks]

```

Dim name As String
Dim nic As String
Dim sex As Char
    Dim status As String
    Dim age As integer
    Dim dob As Date
    Dim dateofbirth As String
Dim course As String
    name=textBox1.text
    nic=Cint(textBox2.text)

    If RadioButton1.Checked = True Then
        sex = "M"

```

```

ElseIf RadioButton2.Checked = True Then
    sex = "F"
End If
Age=Cint(textbox3.text)
status = ListBox1.SelectedItem

dob = CDate(DateTimePicker1.Text)
course=comboBox1.SelectedItem

cn.Open()
Dim cmsql As New SqlCommand
cmsql.Connection = cn
cmsql.CommandText = "update lecturerTB SET name='" &
name & "'," & "sex='" & sex & "',status='" & status & "',age="
& age & ",dob=" & dob & ",course='" & course & "' where nic="
& Val(TextBox2.Text)
cmsql.ExecuteNonQuery()
da.Update(ds)
da.Fill(ds)
cn.Close()

```

d) Write the code segment to view the first record of the table. (First Button).

[05 marks]

```

Dim n as integer
n = 0

```

```

With ds.Tables(0).Rows(n)
    TextBox1.Text = .Item("name")
    TextBox2.Text = .Item("nic")

    If .Item("sex") = "F" Then
        RadioButton2.Checked = True
    ElseIf .Item("sex") = "M" Then
        RadioButton1.Checked = True
    End If

    .....

    If .Item("status") = "Married" Then
        ListBox1.SelectedItem = "Married"
    ElseIf .Item("status") = "Single" Then

        ListBox1.SelectedItem = "Single"
    ElseIf .Item("status") = "Venerable" Then

```

```
        ListBox1.SelectedItem = "Venerable"

    End If

    ' .....
    TextBox3.Text = .Item("age")

    ' .....
    .
    DateTimePicker1.Text = .Item("dob")

    ' .....
    Combobox1.SelectedItem = .Item("course")

End With
End Sub
```