SFU

CMPT 110 D100 – Programming in Visual Basic
Fall 2012
MIDTERM EXAM

Instructor: Richard Frank

Time Allowed: 110 minutes

Last Name (PRINT): _____First Name (PRINT)_____

Student ID Number (PRINT):_____

- There are 10 pages in the exam. Please make sure you have the appropriate number of pages before beginning the exam.

- This is a closed book exam, no other aids are allowed.

- Show rough work where appropriate.

- All questions are compulsory and will be checked. Leaving the question unanswered or partially answered may result in no or partial credit. Some of the questions need to be answered completely showing all steps and derivations used to deduce or calculate the answer in order to receive full credit.

  Best Wishes!

Total	**75**

Multiple-choice questions (Select only ONE answer for each question)

B (1) Which of the following is the correct statement for specifying the words to appear in a label `lblX` on Form called `Form2`?

[1 point]

A) `Form2.Text = "My Text"`   B) `lblX.text = "My Text"`
C) `Me.Text = "My Text"`   D) `Me.Caption = "My Text"`

E (2) What will be the content of the variable *x* after the following statement is executed?   [1 point]
  `x = Math.Sqrt((9 + 5 * 0 + 16) / (4 * 2) + 2)`
A) 1   B) 6   C) 3   D) 4   E) None of the above

B (3) What will be displayed when the following lines are executed?   [2 points]
```
Dim x As Double = 5, y as Double = 2
Dim z As Double = 4
z = x + (y * x)
x = y
z = x + z
lstBox.Items.Add(x + y + z)
```
A) 20   B) 21   C) 10   D) None of the above

A (4) What will be displayed when the following lines are executed?   [2 points]
```
Dim a, b, c As String
a = "Jack And "
b = "Jill"
c = a.Substring(CInt(Math.Sqrt(4)), b.Length)
txtBox.Text = CStr(c)
```
A) ck A   B) d Jill   C) Jack An   D) Jack And Jill

A/C (5) What is a valid input if a Masked Text Box has the following mask: "(00) 0&L0L"   [1 point]
A) "(33) 3aa4a"   B) "(00) ACD3F"   C) "(00) 0&L0L"   D) "(83)d9O4T"

A (6) What is the result of the following code?   [1 point]
```
Dim Boy as string = "Jack"
Dim Girl as string = "Jill"
txtBox.Text = "Boy" & " and " & Girl" & " went up the hill"
```

A) Nothing, there's an error.   B) "Jack and Jill went up the hill"
C) "Jack and Girl went up the hill"   D) " and went up the hill"

C (7) Which one of the following is NOT one of the three main types of errors?   [1 point]
A) Syntax error   B) Logic error   C) Declaration error   D) Run-time error

E (8) What type of numeric variable type holds the most data?   [1 point]
A) Short   B) Long   C) Integer   D) Single   E) Double

(9) Convert the following algebraic equation to Visual Basic. Start by declaring X.   [3 points]

$$X = \frac{y + 2z}{w - v} - c$$

Dim X as single
X = (y + 2 * z) / (w – v) - c

(10) What will be the output of the following program when the button is clicked?   [6 points]

```
Private Sub btnDisplay_Click() Handles Button1.Click
    Dim word1, word2, newWord As String
    word1 = "elephant"
    word2 = "fanatic"
    newWord = word1.Substring(3, 5) & " as " & word2.Substring(4, 3)
    newWord = newWord.Replace(" ", "")
    If newWord.Length > 3 Then
        txtBox.Text = newWord
    Else
        txtBox.Text = "Sorry, not found."
    End If
End Sub
```

Output:

phantastic

(11) What does the following code display?   [6 points]

```
Private Sub btnDisplay_Click(…) Handles btnDisplay.Click
    Dim amt1 As Integer = 5, amt2 As Integer = 7
    lstOutput.Items.Add(amt1 & " "  & amt2)
    Swap(amt1, amt2)
    lstOutput.Items.Add(amt1 & " "  & amt2)
End Sub
Sub Swap(ByRef num1 As Integer, ByVal  num2 As Integer)
    Dim temp As Integer
    temp = num1
    num1 = num2
    num2 = temp
    lstOutput.Items.Add(num1 & " "  & num2)
    num2 = 3
End Sub
```

Output:

5 7
7 5
7 7

(12) Why is Visual Basic called an event-driven programming language? [2 points]

Because VB responds to events, sections of code are run when events are triggered. Events are button-presses, timer, mouse clicks, keyboard key presses, etc.

(13) What is the output of the following code segment? (Assume that all variables have been declared as integers.) [4 points]

```
Dim guess As Integer = 0
For i = 37 To 31 Step -2
   If i < 32 Then
      For j = 1 To 10 Step 4
         If guess < 10 Then
            guess = guess + 5
            lstOutput.Items.Add(guess)
         End If
         guess = guess - j
      Next j
   End If
Next i
lstOutput.Items.Add(guess)
```

5
9
9
0

(14) The full price of a plane ticket is 800$ for example, but discounts are applied to it based on different criteria. The following rules determine the discount, and hence the final price:

- Students get 30% discount.
- People who purchase in 30 days in advance get 20% discount.

Discount can aggregate, for example a student purchasing 30 days in advance gets a 50% discount. You have to ask the user for input on whether they are a student. After you display the final price to the user, you allow the user to enter another price.

(14a) Design the form.   [3 points]

(14b) Write the pseudo-code.   [3 points]

PriceOfTicket = 800

Discount = 0

UserAStudent <= Ask the user if they're a student, accept YES or NO

if UserAStudent = YES then Discount = Discount + 0.3

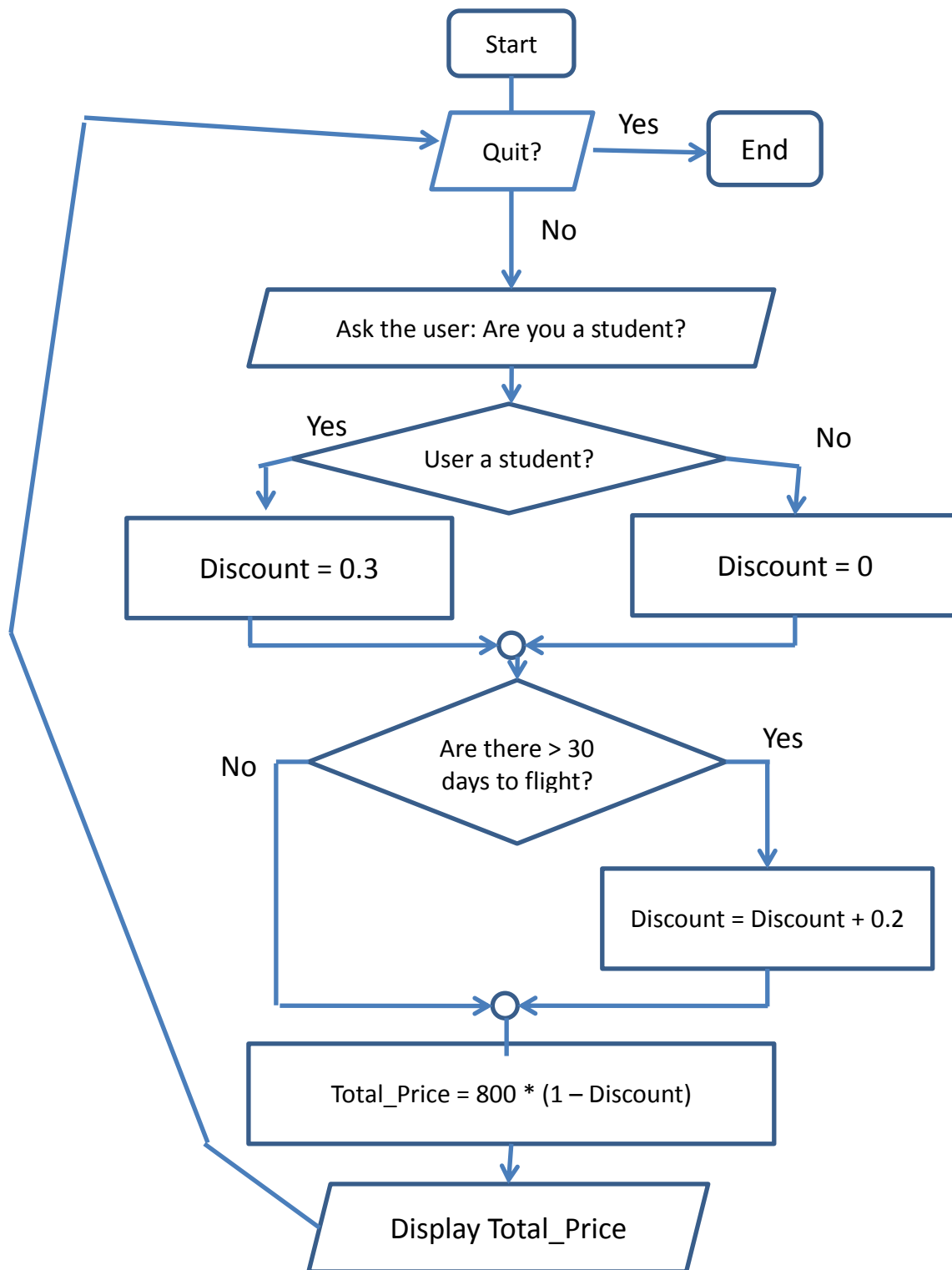FlightDate <= Ask the user when they want to fly

If more than 30 days between FlightDate and today then Discount = Discount + 0.2

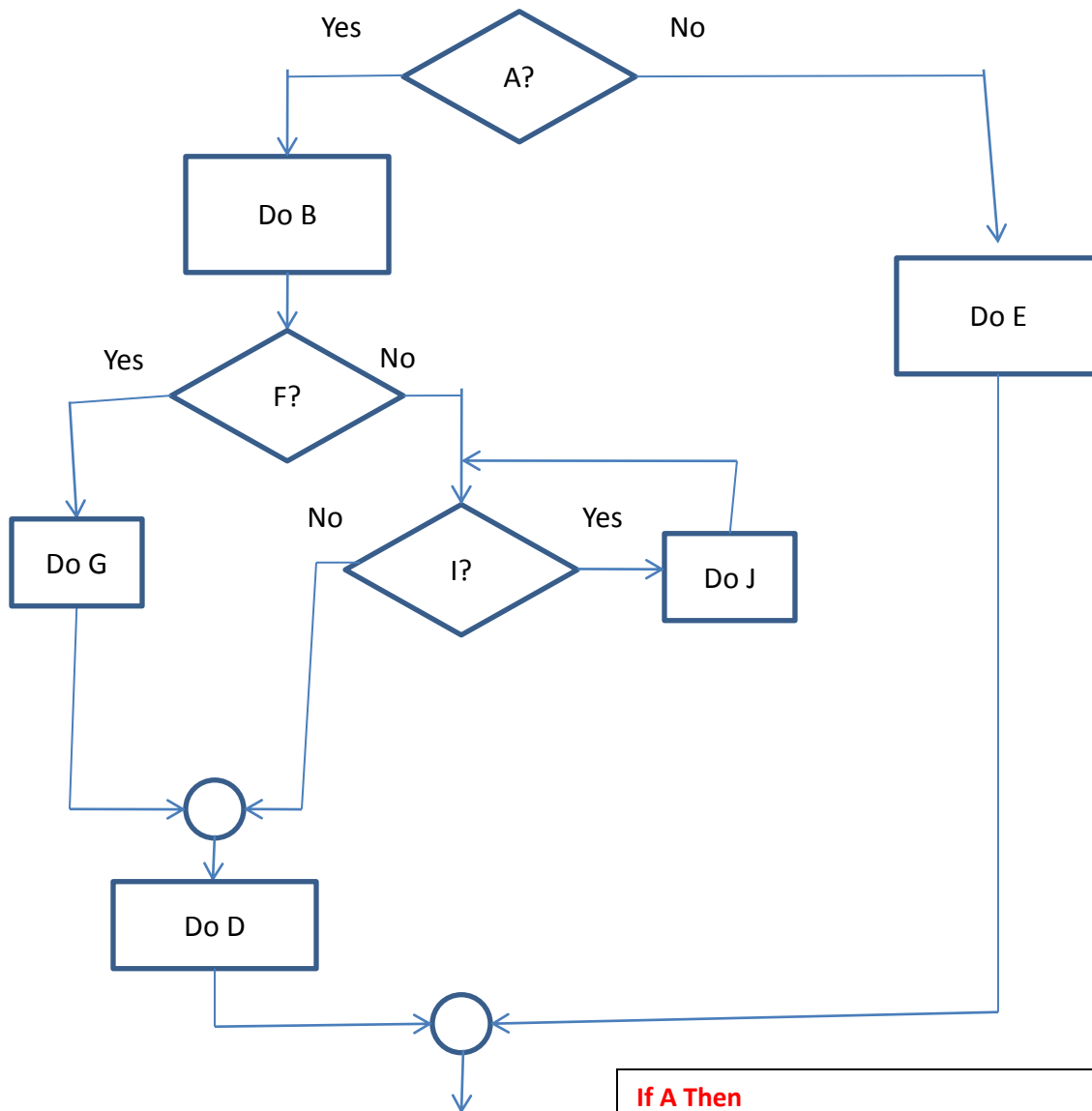FinalPrice = PriceOfTicket * (1 – Discount)

Display FinalPrice to user

(14c) Draw a flowchart of your algorithm that solves the above problem and calculates the final price.

[10 points]

Start

Quit? — Yes → End

No

Ask the user: Are you a student?

Yes — User a student? — No

Discount = 0.3

Discount = 0

Are there > 30 days to flight? — Yes

No

Discount = Discount + 0.2

Total_Price = 800 * (1 – Discount)

Display Total_Price

(15) Translate the following flowchart to pseudo code.   [10 points]


```
If A Then
        Do B
        If F Then
                Do G
        Else
                Do While I is true
                        Do J
                Loop
        End If
        Do D
Else
        Do E
End If
```

(16) Answer the following questions about the value of Z, if   [5 points]

    Z = (X AND Y) OR (X AND (NOT Y))

F   a) If X = FALSE and Y = FALSE then Z =

T   b) If X = TRUE and Y = TRUE then Z =

T   c) If X = TRUE and Y = FALSE then Z =

F   d) If X = FALSE and Y = TRUE then Z =

T   e) Is X = Z?

(17) What will be the output of the following code when it is executed?   [1 points]

```
Dim age As Integer = 42
Select Case age
     Case Is >= 0
            txtBox.Text = "Child"
     Case Is >= 13
            txtBox.Text = "Teenager"
     Case Is >= 21
            txtBox.Text = "Young Adult"
     Case Is >= 40
            txtBox.Text = "Middle Age"
     Case Is >= 65
            txtBox.Text = "Old Person"
     Case Else
            txtBox.Text = "Not Human"
End Select
```
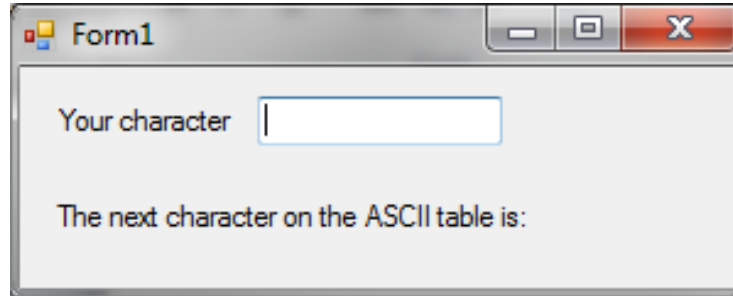
Output: **Child**

(18) You are interested in writing a simple program to display the ASCII character that follows the character that the user types. For example, if the user specifies 'A', the program has to return 'B' (i.e. the character immediately after 'A' on the ASCII table).

(18a) Name the objects on the form which you wish to use in your code. Draw them on the below form:

[3 points]

(18b) What event will your code fire on? [2 points]

```
txtBox.TextChanged
```

(18c) Write the function which calculates the ASCII character given the user's input. [5 points]

```
Private Function NextChar(ByVal InputString As String) As String
    Dim AsciiCode As Integer
    AsciiCode = Asc(InputString)
    AsciiCode = AsciiCode + 1
    NextChar = Chr(AsciiCode)
End Function
```

(18d) Write a small sub-procedure which handles the event, calls the function from (18c) and shows the response to the user. [5 points]

```
Private Sub Button1_Click(…) Handles txtBox.TextChanged
    Dim InputString As String
    InputString = txtBox.Text
    MsgBox(NextChar(InputString))
End Sub
```

BONUS: [3 points]

Write a funny response by the teacher to Jason's shortcut. Marks assigned according to how funny Kyle finds the response.