Please answer questions in the space provided. Question point values are shown in parentheses.

1. (15) Indicate whether the following statements are True or False.

   T or F  A variable declared with a Dim statement in the General Declaration section of a form can be used by any procedure also defined within the same form.

   T or F  It is not legal to declare a local variable in a module using the same name as a module-level variable in that module.

   T or F  Global variables are declared using the Public statement within any procedure in a code module.

   T or F  It is not possible to have local variables within a code module.

   T or F  The properties of a control located on a form can only be accessed from code located within that form.

2. (15) Assume that you want to enforce a rule that states that a numeric value entered into a text box must fall within a certain range, e.g., between 0 and 100 inclusive. Would this rule be best handled in a Change, KeyPress, or LostFocus event for the text box? Explain.

3. (16) Write a complete VB function “maxInt” that finds the maximum of two integers. The following screen image shows the results of applying the function:

   The click event for the “Find max” command button follows:

   ```vba
   Private Sub cmdFindMax_Click()
   Dim max As Integer
   Dim first As Integer
   Dim second As Integer
   first = txtFirst.Text
   second = txtSecond.Text
   max = maxInt(first, second) ' write this function
   lblMax.Caption = max
   ```
4. (12) Assume you have the following four variables:

\[
\begin{align*}
    a &= 10 \\
    b &= 20 \\
    c &= 5 \\
    d &= 2 \\
\end{align*}
\]

Given these variables, evaluate the following VB expressions:

a. \( a + \frac{b}{c} + d + 9 \)

b. \( \frac{b}{a} \ast \frac{c}{d} \)

c. \( (c \text{ Mod } d) \ast b + \frac{b}{a} \)

d. \( (11 + b \ast c) \backslash d \)

5. (15) Assume you have a text box that used for a password. You want to replace each character entered with an asterisk. You also want to be able to use the actual characters entered by the user. For example, consider the following screen image:

Here the user has entered the password into the text box and then clicked on the “Show Password” command button. The actual password text is displayed in the label located below the button. The code for the command button is:

```vbnet
Private Sub cmdShowPwd_Click()
    lblPassword.Caption = passwordText   'passwordText is a variable
End Sub
```

Write the code that manages this text box. The code should allow the use of the Backspace character. For example, the user might have typed “SecretX” above and then the Backspace key (to remove the “X”).

**You may NOT use the PasswordChar property of the text box to solve this problem.**
6. (15) You have three check boxes that indicate whether a person wants to be served any combination of breakfast, lunch, and dinner. You need to create a “Meal Index” that has three characters (one for each meal) and each character will be either 0 or 1 (no meal or meal). For example, consider the following three screen images:

In constructing the Meal Index, dinner is on the left, lunch in the middle, and breakfast is on the right:

```
 0 or 1 0 or 1 0 or 1
Dinner Lunch Breakfast
```

Write the click event for the “Show Meal Index” command button.

```
Private Sub cmdShowMealIndex_Click()
    'you fill in the details here
End Sub
```

When writing your code, assume that the check boxes are named chkBreakfast, chkLunch, and chkDinner.
7. (12) You are given the following code:

```
Option Explicit
Dim a As Integer

Public Sub procA(x As Integer, ByVal y As Integer)
    Dim a As Integer
    a = 10
    x = a
    y = 55
End Sub

Public Sub procB(ByVal b As Integer)
    a = b
    b = 100
End Sub

Public Sub procC(a As Integer, b As Integer)
    Dim x As Integer
    procA a, b
    x = a
    procB x
End Sub

Private Sub cmdQ7_Click()
    Dim b As Integer
    a = 100
    b = 5
    procA a, b
    Form1.Print a, b
    procB 200
    Form1.Print a, b
    a = 30
    b = 90
    procC b, a
    Form1.Print a, b
End Sub
```

Given this code, indicate the output generated by the Form.Print statements when the cmdQ7_Click() event is executed.
1. True
   False
   False
   False

2. This is best handled with a LostFocus event. Both the Change and KeyPress events are called on every keystroke. It is difficult to determine if the user input is valid until after the last keystroke has taken place and there is no way to tell that in either a Change or KeyPress event. You can, however, determine that the last keystroke in a textbox has taken place when the user moves focus to another control (which is when the text box’s LostFocus event is called).

3. A sample code solution is:

   ```vba
   Public Function maxInt(ByVal a As Integer, ByVal b As Integer) As Integer
      If a > b Then
         maxInt = a
      Else
         maxInt = b
      End If
   End Function
   ```

4. a. 25
   b. 5
   c. 22
   d. 55

5. A sample code solution is:

   ```vba
   Dim passwordText As String  'General Declaration

   Private Sub txtPassword_KeyPress(KeyAscii As Integer)
      Select Case KeyAscii
         Case vbKeyBack
            If Len(passwordText) = 0 Then Exit Sub
            passwordText = Left$(passwordText, Len(passwordText) - 1)
         Case Else
            passwordText = passwordText + Chr$(KeyAscii)
            KeyAscii = Asc("*")
      End Select
   End Sub
   ```
6. There are two solution alternatives shown below:

Alternative 1:

```vbnet
Private Sub cmdShowMealIndex_Click()
    Dim mealIndex As Integer
    Dim formattedMealIndex As String

    If chkBreakfast.Value = vbChecked Then
        mealIndex = 1
    End If

    If chkLunch.Value = vbChecked Then
        mealIndex = mealIndex + 10
    End If

    If chkDinner.Value = vbChecked Then
        mealIndex = mealIndex + 100
    End If

    formattedMealIndex = Format$(mealIndex, "000")
    lblMealIndex.Caption = formattedMealIndex
End Sub
```

Alternative 2:

```vbnet
Private Sub cmdShowMealIndex_Click()
   (lblMealIndex.Caption = Str$(chkDinner.Value) & _
     Str$(chkLunch.Value) & Str$(chkBreakfast.Value)
End Sub
```

7. The three Form.Print statements produce the following:

```
10  5
200 5
10 10
```