

Please use the paper supplied by the instructor to answer the questions. Question point values are shown in parentheses.

1. (18) What output is generated by the three MsgBox procedures in the cmdExam1 click event below when that event is executed?

```
Option Explicit  
Dim A As Integer  
Dim B As Integer
```

```
Private Sub cmdExam1_Click()  
Dim A As Integer  
Dim C As Integer
```

```
A = 10  
B = 25  
C = 4
```

```
procA A, B, C  
MsgBox A & "-" & B & "-" & C
```

```
procB A, B, C  
MsgBox A & "-" & B & "-" & C
```

```
procC C  
MsgBox A & "-" & B & "-" & C  
End Sub
```

```
Public Sub procA(X As Integer, ByVal Y As Integer, Z As Integer)  
Dim A As Integer
```

```
A = 100  
X = A  
Y = A  
Z = 200  
End Sub
```

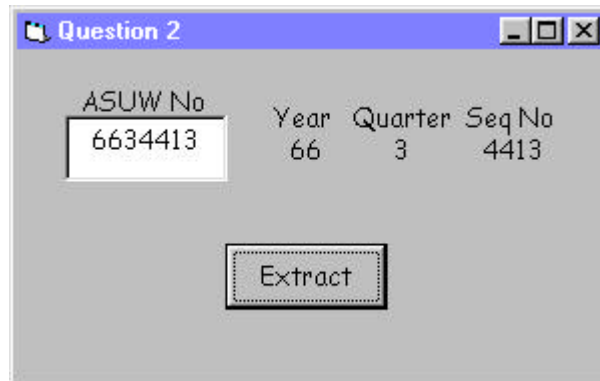
```
Public Sub procB(ByVal A As Integer, B As Integer, C As Integer)  
Dim T As Integer
```

```
T = A  
A = B  
B = T  
C = 33  
End Sub
```

```
Public Sub procC(Z As Integer)  
Dim C As Integer
```

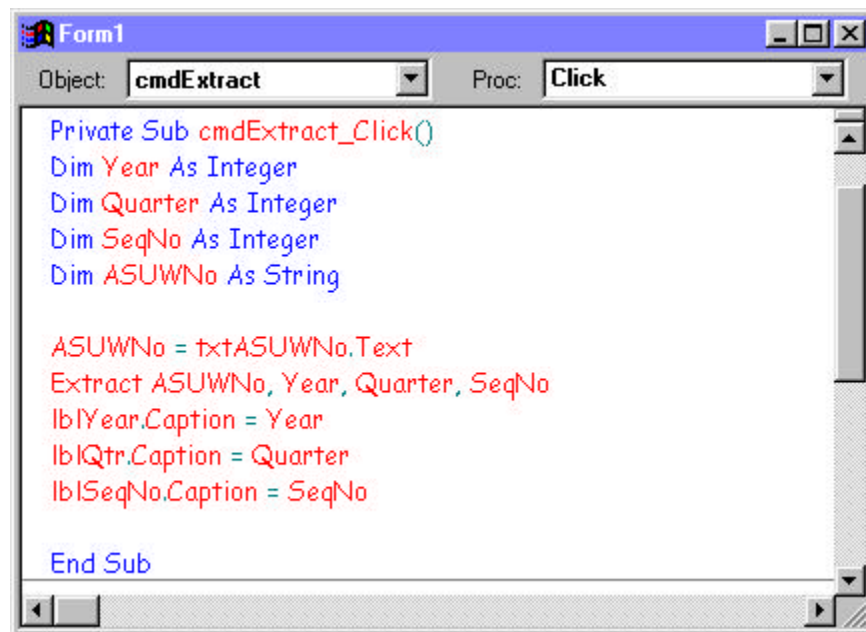
```
C = B  
A = 199  
Z = 833  
procA Z, A, C  
End Sub
```

2. (15) An ASUW number at the UW includes the year and quarter a student is admitted to school plus a four-digit sequence number. The following form shows the effects of clicking on the Extract button that separates these three fields from any valid ASUW number.



The screenshot shows a window titled "Question 2" with a light gray background. At the top left, there is a text box labeled "ASUW No" containing the value "6634413". To the right of this text box, the digits are separated into three columns: "Year" with the value "66", "Quarter" with the value "3", and "Seq No" with the value "4413". Below these fields, centered, is a button labeled "Extract" with a dotted border.

The code for the click event is shown below:



```
Form1
Object: cmdExtract Proc: Click
Private Sub cmdExtract_Click()
    Dim Year As Integer
    Dim Quarter As Integer
    Dim SeqNo As Integer
    Dim ASUWNo As String

    ASUWNo = txtASUWNo.Text
    Extract ASUWNo, Year, Quarter, SeqNo
    lblYear.Caption = Year
    lblQtr.Caption = Quarter
    lblSeqNo.Caption = SeqNo
End Sub
```

Write the Extract procedure shown above to extract the year, quarter, and sequence number from an ASUW student number.

3. (18) Assume that the following variables are declared and set to initial values.

```
Dim A As Integer, B As Integer  
Dim C As String, D As String
```

```
A = 10  
B = 5  
C = "Apple"  
D = "21 or older"
```

Given these variables, what would be the value of the following expressions?

- $A * B + 10 / 2 * A$
 - `InStr(1, C, "p")`
 - $D > "10 \text{ and under}"$
 - $(A ^ 2 + B * B) \text{ Mod } 10$
 - $A > 0 \text{ Or } B <= 0$
 - $(A + B * A) \setminus 10$
4. (16) Convert the following algebraic equations into valid VB expressions.

a.
$$\frac{A^2 + B^2}{D + E}$$

b. $(A + B)^{M \times N} - K$

c.
$$\frac{K - [R + Q] + T^2}{100 - K}$$

d.
$$\frac{\frac{A}{B} \times \frac{C}{D}}{R^T - S^T}$$

5. (12) An insurance company uses three variables to determine the risk factor associated with determining health insurance rates. These variables include an individual's sex, age, and health. The risk factor is cumulative. It starts out at zero and then increases depending on the status of the three variables.

For males, the risk factor is increased by .15 and for females, it is increased by .05. The risk factor is impacted by age as follows:

Age	Risk Factor Increase
1-18	.03
19-24	.05
25-40	.08
41-55	.12
56-99	.18

Finally, the risk factor is impacted by health status as follows:

Health Status	Risk Factor Increase
Excellent	.01
Good	.06
Fair	.11
Poor	.20

You are given the following variable declarations:

```
Dim Sex As String, Age As Integer  
Dim HealthStatus As String, RiskFactor As Currency
```

Assume that the three decision variables (Sex, Age, and HealthStatus) have been set to valid values. Write a code segment that sets the variable RiskFactor to its proper value.

6. (12) You are given the following empty KeyPress event procedure:

```
Private Sub txtQuestion6_KeyPress(KeyAscii As Integer)  
  
End Sub
```

Complete the code for this event procedure that enforces the following rules:

- a. Allow digits 0 through 9
 - b. Allow capital letters A through Z.
 - c. Allow lowercase letters a through z but convert them to uppercase as they go into the text box.
 - d. Allow the use of the backspace key.
 - e. Allow *at most* one exclamation mark (!). Be sure that the user can enter a second exclamation mark if the first one is erased via a backspace.
 - f. Discard all other characters and have the project beep.
7. (9) Assume that when a user finishes entering text into a text box (as indicated by clicking on another text box), there must be at least one decimal point in the original text box. If not, the user should be notified via a message box.

Would a KeyPress event, a Change event, or a LostFocus event be the most appropriate place to make this test? Explain.

Answer Key

1. First message box 100-25-200
Second message box 100-100-33
Third message box 100-100-100
2. One version of the Extract procedure is

```
Public Sub Extract(ByVal a As String, _  
                  y As Integer, _  
                  q As Integer, _  
                  s As Integer)
```

```
y = Val(Left$(a, 2))  
q = Val(Mid$(a, 3, 1))  
s = Val(Right$(a, 4))
```

```
End Sub
```

3. a. 100
b. 2
c. True
d. 5
e. True
f. 6
4. a. $(A^2 + B^2) / (D + E)$
b. $(A + B)^{(M * N)} - K$
c. $(K - (R + Q) + T^2) / (100 - K)$
d. $((A / B) * (C / D)) / (R^T - S^T)$

5. A code segment that works for this question is

```
If Sex = "Male" Then
    RiskFactor = 0.15
Else
    RiskFactor = 0.05
End If

Select Case Age
Case 1 To 18
    RiskFactor = RiskFactor + 0.03
Case 19 To 24
    RiskFactor = RiskFactor + 0.05
Case 25 To 40
    RiskFactor = RiskFactor + 0.08
Case 41 To 55
    RiskFactor = RiskFactor + 0.12
Case Else
    RiskFactor = RiskFactor + 0.18
End Select

Select Case HealthStatus
Case "Excellent"
    RiskFactor = RiskFactor + 0.01
Case "Good"
    RiskFactor = RiskFactor + 0.06
Case "Fair"
    RiskFactor = RiskFactor + 0.11
Case "Poor"
    RiskFactor = RiskFactor + 0.20
End Select
```

6. The complete KeyPress event is:

```
Private Sub txtQuestion6_KeyPress(KeyAscii As Integer)  
Dim Loc As Integer  
  
Select Case KeyAscii  
Case Asc("0") To Asc("9"), Asc("A") To Asc("Z"), 8  
    'do nothing - digits, uppercase letters, backspace  
Case Asc("a") To Asc("z") 'shift to uppercase ANSI code  
    KeyAscii = Asc(UCase$(Chr$(KeyAscii)))  
Case Asc("!")  
    Loc = InStr(1, txtQuestion6.Text, "!")  
    If Loc > 0 Then 'allow only one  
        KeyAscii = 0  
    End If  
Case Else  
    KeyAscii = 0  
    Beep  
End Select  
  
End Sub
```

7. KeyPress and Change events would not make sense because they do not know when the user has clicked on another text box nor do they know if additional characters will be entered into the text box.

The only really good way to tell is to use a LostFocus event similar to the following:

```
Private Sub txtQuestion7_LostFocus()  
  
If InStr(1, txtQuestion7.Text, ".") = 0 Then  
    MsgBox "You have to have at least one decimal point"  
    txtQuestion7.SetFocus  
End If  
End Sub
```