

OLLSCOIL NA hÉIREANN, GAILLIMH
NATIONAL UNIVERSITY OF IRELAND, GALWAY

SEMESTER I
WINTER EXAMINATIONS 2002/2003

Second University Examination in Arts

PROGRAMMING II (CT240)

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Time allowed: **Two hours.**

Candidates should attempt question one and any two other questions.
All questions carry equal marks.

1. (a) Describe what you understand by the terms:

- Event-Driven
- Procedural

as applied to programming languages. Give one example of each. (6)

(b) In the following Visual Basic code, identify the error, giving an explanation, and rewrite the program to correctly perform the intended task:(6)

```
Private Sub cmdDisplay_Click()
    Dim i As Integer
    Dim a(1 To 10) As Integer, b(1 To 10) As Integer
    For i = 1 To 10
        a(i) = i ^ 2
    Next i
    Call CopyArray(a(), b())
    picOutput.Print b(10)
End Sub

Private Sub CopyArray(a() As Integer, b() As Integer)
    'Place a's values in b
    b() = a()
End Sub
```

- (c) Suppose an array has been declared in the (Declarations) section of (General) with the statement `Dim scores(1 To 50) As Single` and numbers assigned to each element by the `Form_Load` event procedure. Write a procedure to determine if the array is in ascending order. (8)

2. (a) Write an explanation of each of the following terms:

- Event procedure
- General procedure

What are the benefits of using general procedures when programming? (6)

- (b) Given the following Visual Basic code, determine the output displayed in the picture box when the command button is clicked. (4)

```
Private Sub cmdDisplay_Click()  
    Dim a As Single  
    a = 5  
    Call Multiply(7)  
End Sub
```

```
Private Sub Multiply(num As Single)  
    Dim a As Single  
    picOutput.Print a * num  
End Sub
```

- (c) According to Plato, a man should marry a woman whose age is half his age plus seven years. Write some Visual Basic code to read a man's age as input from a text box (`txtAge`), and displays in a picture box (`picOut`) the ideal age of his wife. You should write a function procedure to perform the calculation. (10)

3. (a) Write a note on the `EOF` function in Visual Basic. Show how it can be used in an `EOF`-controlled loop. (4)

- (b) Given the following Visual Basic code, determine the output displayed in the picture box when the command button is clicked. (6)

```
Private Sub cmdDisplay_Click()  
    Dim q As Single  
    q = 3  
    Do While q < 15  
        picOutput.Print q  
        q = 2 * q - 1  
    Loop  
    picOutput.Print q  
End Sub
```

- (c) Assume the file GRADES.TXT contains student grades on a final exam. Write some Visual Basic code that displays in a picture box (picOut) the average grade on the exam and the percentage of grades that are above average. (10)
4. (a) Describe using pseudocode or a flowchart (or otherwise) the algorithm for a bubble sort of an array of n items. In what circumstances should a bubble sort be used? (8)
- (b) Using your algorithm from part (a), demonstrate how the following list of rivers would be sorted : Thames, Amazon, Volga, Shannon, Nile. Assume these are contained in an array declared as `Dim river(1 To 5) As String`. After how many swaps will the list be sorted? (6)
- (c) Suppose a list of 5000 numbers is to be sorted, but the numbers consist of only 1, 2, 3 and 4. Describe a method of sorting the list that would be much more efficient than using a bubble sort. (6)
5. (a) Describe the differences between the following types of errors, giving at least one example of each: (6)
- syntax errors
 - run-time errors
 - logic errors
- (b) In the following Visual Basic code, identify the errors and say whether each is a syntax, run-time or logic error: (6)
- ```
Private Sub cmdDisplay_Click()
 Dim fruit as String
 fruit = "Peach"
 Select Case UCase(fruit)
 Case Is >= "Peach"
 picOutput.Print "Georgia"
 Case "ORANGE To PEACH"
 picOutput.Print "Ok"
 End Select
End Sub
```
- (c) Write some Visual Basic code that reads a month of the year from a text box (txtMonth) and then gives the number of days in the month, displayed in a picture box (picOut). If the month is February, the user should be asked whether or not the current year is a leap year. (8)