

Name:.....

Course:.....

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# CITY UNIVERSITY LONDON

## Excel VBA Progress Test

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### Group A (Solutions)

This is an open book exam. You may use your lecture notes as well as task- and solution-sheets from previous lab-sessions.

Write your answers in the spaces provided after each question, continuing on the blank back of the sheets if necessary.

Full marks may be obtained for correct answers to all four questions, that is 100 points.

To avoid possible accusations of cheating close all other applications except Excel before starting this exam.

Time:        You have 75 mins to complete this test.

1) (25 points)

- a) Compute the future value of an investment using the Excel built-in function FV. For an initial deposit of 5750 Euro in a savings account the bank pays an interest rate of 0.25%. For the next years the owner of the account plans to deposit 350 Euros at the beginning of every month into the account. How much money is in the account after 7 years. Provide the exact command line for an Excel built-in function with all its arguments.
- b) Write down the command line for an Excel built-in function which produces the function

$$f(x) = \begin{cases} (x - 12)/3 & \text{for } x \leq 5 \\ 3x^2 - 5x & \text{for } x > 5 \end{cases} .$$

Implement your the function into a spreadsheet and complete the following table. Give your answer up to a precision of two digits.

|        |       |   |     |       |
|--------|-------|---|-----|-------|
| $x$    | -1.25 | 5 | 5.9 | 111.8 |
| $f(x)$ |       |   |     |       |

a) =FV(0.25%,84,-350,-5750,1) 10

After 5 years there are 39,843.14 Euros in the account. 2

b) =IF(x<=5, (x-12)/3, 3\*x ^2-5\*x) 9

|        |       |       |       |          |
|--------|-------|-------|-------|----------|
| $x$    | -1.25 | 5     | 5.9   | 111.8    |
| $f(x)$ | -4.42 | -2.33 | 74.93 | 36938.72 |

4

2) (25 points)

- a) Write a user defined function called “MaxMin”, which computes for an arbitrary amount of input variables the minimum  $MI$  and the maximum  $MA$  of these variables. The function “MaxMin” should return the value

$$\frac{MA - 3}{(MI - 4)^2}$$

when  $MI - 4 \neq 0$  and the error message “Division by zero!” otherwise.

- b) Use your function to complete the following table:

| x  | y  | z  | MaxMin |
|----|----|----|--------|
| 6  | 8  | 5  |        |
| 12 | 4  | 9  |        |
| -2 | 75 | 27 |        |

- 
- a) Function MinMax(range) As Variant

Dim Mi, Ma As Integer

Ma = WorksheetFunction.Max(range)

Mi = WorksheetFunction.Min(range)

If Mi = 4 Then

MinMax = "Division by zero!"

Else

MinMax = (Ma - 3) / (Mi - 4) ^2

End If

End Function

- b) The table should be:

| x  | y  | z  | MaxMin            |
|----|----|----|-------------------|
| 6  | 8  | 5  | 5                 |
| 12 | 4  | 9  | Division by zero! |
| -2 | 75 | 27 | 2                 |

2

2

2

2

11

6

3) (30 points)

- a) Consider the following table and complete the command lines and output below, i.e. replace the \*\*\* with the appropriate data

|   | A          | B                  | C      | D    | E           |
|---|------------|--------------------|--------|------|-------------|
| 1 | Name       | Street             | Number | Code | Phone       |
| 2 | S. Holmes  | Baker Street       | 221b   | NW1  | 0207-040111 |
| 3 | S. Rushdie | St. Peter's Street | 41     | N1   | 0207-140712 |
| 4 | G. Orwell  | Canonbury Square   | 27b    | N1   | 0207-780669 |
| 5 | W. Blake   | Broad Street       | 28     | W1   | 0207-767884 |
| 6 | J. Joyce   | Campden Grove      | 28b    | W8   | 0207-334015 |
| 7 |            |                    |        |      |             |

In case there is more than one solution present all of them.

=VLOOKUP("G. Orwell", \*\*\*, 2) → Canonbury Square

=VLOOKUP(\*\*\*, A2:E6, 4) → N1

=VLOOKUP("Broad Street", \*\*\*, 3, \*\*\*) → W1

=VLOOKUP("Oxford Street", B3:E7, 3, \*\*\*) → #N/A

=HLOOKUP("Baker Street", B2:E6, \*\*\*, \*\*\*) → Broad Street

=HLOOKUP("NW3", B2:E6, \*\*\*) → 0207-767884

- b) Write a user defined function called "Add", with two input parameters. The first input parameter is the name of a person. The function selects from the table in a), by means of a VLOOKUP, for a given name, the street, the number of the house, the postal code or the phone number, when the second input parameter is "Road", "Number", "Code" or "Phone", respectively. When the wrong command is used for the second input parameter produce the error message "Command not found!". Declare all your variables.

- a) =VLOOKUP("G. Orwell", A2:E6, 2) → Canonbury Square 2  
 =VLOOKUP("S. Rushdie"/"G. Orwell", A2:E6, 4) → N1 4  
 =VLOOKUP("Broad Street", B2:E6, 3, FALSE) → W1 2  
 =VLOOKUP("Oxford Street", B3:E7, 3, FALSE) → #N/A 2  
 =HLOOKUP("Baker Street", B2:E6, 4, FALSE) → Broad Street 2  
 =HLOOKUP("NW3", B2:E6, 4) → 0207-767884 2
- b) Function Add(na As String, command As String) As String 14  
 Select Case command  
 Case "Street": Add = WorksheetFunction.VLookup(na, [A2:E6], 2, False)  
 Case "Number": Add = WorksheetFunction.VLookup(na, [A2:E6], 3, False)  
 Case "Code": Add = WorksheetFunction.VLookup(na, [A2:E6], 4, False)  
 Case "Phone": Add = WorksheetFunction.VLookup(na, [A2:E6], 5, False)  
 Case Else: Add = "Command not found!"  
 End Select  
 End Function

4) (20 points)

The following user defined function divides people into different age groups: Group I (1-10), Group II (11-18), Group III (19-30), Group IV (31-45), Group V (46-65) and Group VI people older than 65. Eliminate from this function the IF-structure and replace it by a SELECT CASE structure. In addition implement into the new code an error message "Wrong birthdate" when the age is negative

```
Function agegroup(birthdate As Date)
```

```
    Dim age As Integer
```

```
    age = Int((Now() - birthdate) / 365)
```

```
    If age <= 10 Then
```

```
        agegroup = "Group I"
```

```
    ElseIf age <= 18 Then
```

```
        agegroup = "Group II"
```

```
    ElseIf age <= 30 Then
```

```
        agegroup = "Group III"
```

```
    ElseIf age <= 45 Then
```

```
        agegroup = "Group IV"
```

```
    ElseIf age <= 65 Then
```

```
        agegroup = "Group V"
```

```
    Else
```

```
        agegroup = "Group VI"
```

```
    End If
```

```
End Function
```

---

```
Function agegroup(birthdate As Date)
```

20

```
    Dim age As Integer
```

```
    age = Int((Now() - birthdate) / 365)
```

```
    Select Case age
```

```
        Case Is < 1: agegroup = "Wrong birthdate"
```

```
        Case 1 To 10: agegroup = "Group I"
```

```
        Case 11 To 18: agegroup = "Group II"
```

```
        Case 19 To 30: agegroup = "Group III"
```

```
        Case 31 To 45: agegroup = "Group IV"
```

```
        Case 46 To 65: agegroup = "Group V"
```

```
        Case Else: agegroup = "Group VI"
```

```
    End Select
```

```
End Function
```