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# CITY UNIVERSITY LONDON

## Excel VBA Practical Test

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14th of January 2008

Group A

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 booklet provided.

Full marks may be obtained for correct answers to all four questions. Each questions carries 25 marks.

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

Time:        You have 90 mins to complete this test.

Turn over...

- 1) i) (7 points) Write down the command line for a combination of Excel built-in functions which produces the following function

$$f(x) = \begin{cases} \sin(x) & \text{for } -1 \leq x \leq 1 \\ \sin\left(\frac{x^2+1}{2}\right) & \text{for } x > 1 \\ \frac{\sin(x)}{x} & \text{for } x < -1 \end{cases} \quad (1)$$

Use your function to compute  $f(1)$  and  $f(-2)$ .

- ii) (7 points) Write a user defined function called  $g(x)$  that produces exactly the same function of part i) by employing an **IF ... ELSEIF** structure. Compute the values  $g(2)$  and  $g(-1)$ .
- iii) (11 points) Write down the function (in a form similar to equation (1)) that is produced by the following combination of Excel built-in functions:

$$= \text{IF}(\text{AND}(x \geq 0, x < 1), 2x, \text{IF}(\text{AND}(x \geq 1, x < 2), 5 - 3x, \text{IF}(x \geq 2, -1, 0))).$$

Produce a sketch of the function above in your answer booklet.

- 2) (25 points) Enter the table below in the range A1:D4 of your Excel worksheet:

1	5	6	January
2	7	8	February
3	9	11	March
4	23	24	April

In this exercise we want to extract information from the table above by employing the **VLOOKUP** and **HLOOKUP** Excel built-in functions. In each of the following lines, we have written an Excel built-in function on the l.h.s. and its output on the r.h.s. Fill in the blank spaces on the l.h.s. of each line so that the given output is produced:

$$\begin{aligned}
 &= \text{VLOOKUP}(1, A1:D4, \quad ) && \rightarrow 5 \\
 &= \text{VLOOKUP}(1.8, A1:D4, \quad ) && \rightarrow 6 \\
 &= \text{VLOOKUP}(9, C1:D4, \quad ) && \rightarrow \text{February} \\
 &= \text{HLOOKUP}(1.8, A1:D4, \quad ) && \rightarrow 4 \\
 &= \text{HLOOKUP}(9, A2:D4, \quad ) && \rightarrow 24 \\
 &= \text{HLOOKUP}(9, A1:D3, \quad ) && \rightarrow 8 \\
 &= \text{VLOOKUP}(16, \quad , 2) && \rightarrow \text{March} \\
 &= \text{VLOOKUP}(8, \quad , 2) && \rightarrow 8 \\
 &= \text{VLOOKUP}(8, \quad , 2) && \rightarrow \text{February} \\
 &= \text{HLOOKUP}(3, \quad , 2) && \rightarrow 3 \\
 &= \text{HLOOKUP}(7.2, \quad , 3) && \rightarrow 23 \\
 &= \text{HLOOKUP}(5, \quad , 3) && \rightarrow 9 \\
 &= \text{VLOOKUP}(\quad , A1:D4, 4, \text{FALSE}) && \rightarrow \text{April} \\
 &= \text{VLOOKUP}(\quad , B1:D3, 2, \text{FALSE}) && \rightarrow 11 \\
 &= \text{VLOOKUP}(\quad , B2:D3, 3, \text{FALSE}) && \rightarrow \text{March} \\
 &= \text{HLOOKUP}(\quad , B1:D4, 4, \text{FALSE}) && \rightarrow \text{April} \\
 &= \text{HLOOKUP}(\quad , A2:D4, 3, \text{FALSE}) && \rightarrow 24 \\
 &= \text{HLOOKUP}(\quad , A2:D3, 2, \text{FALSE}) && \rightarrow 3
 \end{aligned}$$

Turn over...

- 3) i) (18 points) Use a **SELECT CASE** structure to produce a user defined function called **whichday**. The function should take a date as input and produce the following output:
- If the date falls on a weekday (that is Monday to Friday, both included), then it should output the name of the day (that is, if the day was a Monday, then the output of the function should be the word “Monday”).
  - If the date falls on a weekend (that is Saturday or Sunday) then your program should produce the output: “This date falls on a weekend”
  - In the program you should define all variable types, both for the input and for the output of your function.
  - Obtain the value of the function for the input date 20/11/1945.
- ii) (7 points) Draw a flow chart corresponding to your programme.
- 4) Consider the table given below and suppose that you enter the data on this table into the range A1:F4 of your Excel worksheet:

	Parmar	Lopez	Hirch	Oota	Patel
W1	41	43	42	43	45
W2	45	46	40	50	45
W3	50	41	48	42	35

The first row of the table contains the names of several employees of a company. The second, third and fourth rows contain information about the number of hours that each of this employees has worked in the first, second and third weeks after the start of their contract, respectively. This exercise has three parts:

- i) (10 points) Write the code of a user defined function called **avehours** that takes the name of a given employee as input produces the average number of hours per week that he/she has worked over the first three weeks of his/her contract as output. The program should employ the worksheet function **HLOOKUP** and all variable types (both for the input and the output of the function should be defined)
- ii) (10 points) The second function should be called **class** and take again as an input the name of a certain employee. The function **class** should make use of the function **avehours** defined in i) and employ an **IF...ELSEIF** structure. Depending on the name of the employee, the function should return one of the following values:
- If the average number of hours of work per week is lower than 42 it should return the message: “not enough work”
  - If the average number of hours of work per week is bigger or equal 42 and smaller than 47 it should return the message: “decent performance”
  - If the average number of hours of work per week is larger than 46 then it should return the message: “to be recommended for promotion”
- iii) (5 points) Compute avehours(“Lopez”) and class(“Lopez”).

Internal examiner: Dr. Olalla Castro-Alvaredo