
CITY UNIVERSITY LONDON

Excel VBA Practical Test

January 2011

Group A

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

Please notice that all the material must be brought to the test in printed form. No internet access, books or USB keys are allowed into the test.

Write your answers in the booklet provided. Please notice that the marker will not have access to any work you do in the computer. The only answers that will be graded are those you write down in the answer 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 and VBA before starting this test.

Time: You have 90 mins to complete this test.

Turn over...

- 1) i) Write two different versions of a command line for a combination of Excel built-in functions which produces the following function

$$f(x) = \begin{cases} x^2 + 1 & \text{for } x < 0 \\ 1 & \text{for } x = 0 \text{ or } x = 4 \\ \cos(x) & \text{for all other values of } x \end{cases}$$

(12 marks)

- ii) Consider the following combination of Excel built-in functions:

$$= \text{IF}(\text{OR}(x > 2, x < -2), x, \text{IF}(\text{AND}(x > -1, x < 1), 1/(x + 2), x^3))$$

- (a) For which values of x does the function return positive values? (5 marks)
 (b) For which values of x does the function return values greater than 1? (5 marks)
 (c) For which values of x does the function return the value -8? (3 marks)
- 2) Consider the table below which lists the values of all trigonometric functions for fixed values of the angle $x = 0, \frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3}$ and $\frac{\pi}{2}$:

	A	B	C	D	E	F
1	x	0	0.5236	0.7854	1.0472	1.5708
2	sin(x)	0	0.50	0.71	0.87	1
3	cos(x)	1	0.87	0.71	0.50	0
4	tan(x)	0	0.58	1.00	1.73	Not Defined
5	sec(x)	1	1.15	1.41	2.00	Not Defined
6	cosec(x)	Not Defined	2.00	1.41	1.15	1
7	cot(x)	Not Defined	0.87	1.00	0.58	0

- (i) Write the code for a User Defined Function of one variable called **trig** that takes an angle (in radians) as input and returns the following value as output:

- If the angle equals one of the five values listed in the first row of the table, then the function should compute:

$$(\sin \theta)^2(\cos \theta)^4,$$

where the values of $\sin \theta$ and $\cos \theta$ must be read out from the table by using the appropriate **HLOOKUP** functions.

- If the angle is not one of the values in the table, then the function should compute the same formula above, but this time employing the standard VBA functions **sin** and **cos**.

(20 marks)

- (ii) Find the value of the function for $\theta = \frac{\pi}{3} \approx 1.0472$. (5 marks)

In your code define the variable types of the input and output of the function and use a **SELECT CASE** structure.

Turn over...

- 3) A company wants to provide information to its customers about opening times and delivery times for their home delivery service. This question asks you to help this company by designing a User Defined Function called **times**. This function takes two values as input: a time of the day (for example 12:01:50) and the name of a week's day (for example, Monday). Given these two pieces of information, the function should do the following:
- (a) If the week's day is Sunday, the function should return: "Apologies, we are closed"
 - (b) If the week's day is Saturday, the function should return: "Opening times are 10am to 5pm. Home deliveries between 11am and 6pm"
 - (c) If the week's day does not fall on the weekend, then:
 - (c.1) If the time given is between 8am and 11am (both times included), the function should return: "We are open now. Home deliveries start at 11am".
 - (c.2) If the time given is between 11am and 18pm, the function should return: "We are open now and carrying out home deliveries".
 - (c.3) For any other times, the function should return: "We are closed now. Home deliveries tomorrow between 11am and 18pm".

The code must employ two (nested) **IF...ELSEIF** structures. The variable type of the input and output must be defined.

(25 marks)

- 4) The following table shows a list of employees of a small company, including their names, birth dates, positions and salaries. In this company managers get a percentage yearly increase in their salary of 4% whereas the trainee gets an increase of 2% and the assistants get an increase of 3%.

	A	B	C	D
1	Employee's Name	Birthdate	Position	Salary
2	J.Maldacena	12/05/1975	Assistant	30,678.00
3	A.Sen	03/06/1979	Manager	36,000.00
4	M.Boos	15/09/1950	Manager	36,000.00
5	N.Slavnov	23/10/1980	Trainee	23,000.00
6	V.Korepin	01/01/1965	Assistant	30,678.00

- (i) Write down the code of a user defined function called **salary** which, takes the name of an employee as input and computes its expected salary next year according to the formula,

$$\text{Expected Salary} = \text{Current Salary} + \frac{(\text{Percentage Increase}) * (\text{Current Salary})}{100},$$

where the "Current Salary" must be read out from the table by using the appropriate **VLOOKUP** functions and the "Percentage Increase" is 4, 3 or 2 depending on the employee's position (as described above). You may also use a VLOOKUP function to read out the employee's position from the table.

Design your function in such a way that if the input is not an employee's name on the table, the function returns the message: "not working here".

(20 marks)

- (ii) Use your function to find the salary of N.Slavnov next year.
(5 marks)

Define the variable types of the input and the output of your function and use at least one **IF...ELSEIF** structure.

Internal examiner: Dr. Olalla Castro-Alvaredo