

Matlab Test

24/10/08, 10 minutes! Name: _____, Faculty: _____, Year: __

1. Can you identify the name of each window in Matlab and briefly describe their functions? (10 marks, 2 marks each)

a). Matlab main window. You will see this when you run Matlab.

b).

c).

d).

e).

f).

2. (5 marks). Matlab stands for Mat_____ lab_____. It is because in Matlab, every object is a _____.

3. (20 marks, 2.5 marks each). What is the result if you execute the following statements in Matlab Command Window?

No	Command entered (one by one)	What I see in Matlab window(s)
1	A = [1 2; 3 4];	
2	B = 2*A;	
3	% ehem	
4	B(1,2)	
5	C = [1;2];	
6	A*C	
7	D = [4;7];	
8	E = C.*D	

4. During high school days, you may have done this kind of calculation before: “ $x = y + 1$ ” and “ $2x = y$ ”.

a). (1 marks). What is x and y? $x = \underline{\hspace{2cm}}$, $y = \underline{\hspace{2cm}}$

b). (1 marks). This mathematical problem is called _____ algebra.

c). (8 marks). Write down the commands to compute x and y in Matlab!

5. (25 marks, 2.5 marks each). What is the result if you execute the following statements in Matlab Command Window?

No	Command entered (one by one)	What I see in Matlab window(s)
1	x = -pi:0.5:pi	
2	x = linspace(-pi,pi,20)	
3	y = sin(x)	
4	plot(x,y)	

5	plot(x,y, 'r^--')	
6	help plot	
7	z = cos(x)	
8	hold on	
9	plot(x,z,'gd-.','LineWidth',2)	
10	legend('sine','cosine')	

6. We have a Matlab code written by our FYP senior.

a. (2 marks). This code is saved as “mystery.m”. Why the file name is the same as the function name? Also, why the extension ends with “*.m”?

b. (6 marks). Question: what was my senior trying to do with the code below?

<pre>function returnValue = mystery(inputArray) % mystery(inputArray), this function will bla bla bla returnValue = inputArray(1); for index = 2:numel(inputArray) if inputArray(index) > returnValue returnValue = inputArray(index); end end</pre>	Write your explanation here:
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c. (2 marks). What is the value reported by Matlab if we run “mystery([5 2 1 4 7 2 3])”? _____

7. (20 marks). Your FYP project is about analyzing “speech signal”: given a human voice signal that utter a single digit, you have to analyze the signal data and decide what digit [0..9] that utterance is!... You have thousands (err) of such speech signal data, so manual processing is not an option. Your FYP supervisor has instructed you to come up with a Matlab program to solve this problem. This is complex task... For this quick test, we will only deal with the simplified problem.

The simplified problem is as follows: given a text file containing n numbers (x_1, x_2, \dots, x_n) of signal measurement,

x_k can be from [-0.3 .. 0.3], decide what is the average magnitude $\frac{\sum_{k=1}^n |x_k|}{n}$ and average power $\frac{\sum_{k=1}^n x_k^2}{n}$ of the signal?

Write your Matlab code here: