Reg.No. _____

Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 14CE3034 **Semester : 2016-17 ODD**
Sub. Name : Fundamentals of MATLAB programming **Duration : 3hrs**
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	1. Suppose x is a new variable, with the following Matlab statement, x = [-10: -1: -15; -2: 3]; How many elements are generated in x? (A) 0; because there is an error in the assignment (B) 10 (C) 12 (D) 5 (E) 6 2. Create a vector of the even whole numbers between 31 and 75. 3. Given vectors x=[-1, 2, 3, -2], y=[0.2, 3.1, 0, -3] and z=[3, 0, 1, 0.1], provide answers to the following operations. (A) x < y > z (B) x + ~y > z (C) x == y ~=z	CO 1	6
	b.	Given the array A = [2 7 9 7 ; 3 1 5 6 ; 8 1 2 5], explain the results of the following commands: a. A'; b. A(:,[1 4]); c. A([2 3],[3 1]; d. reshape(A,2,6); e. A(:) ; f. [A A(end,:)]; g. A(1:3,:); h. [A ; A(1:2,:)]; i. sum(A); j. sum(A'); k. sum(A,2)	CO 1	7
	c.	Write in detail about relational, logical and mathematical operators with examples	CO 1	7
		(OR)		
2.	a.	Write the MATLAB commands to generate a table of conversions from inches to centimeters. The range of inches should be from 0 to 36 in increments of 3.	CO 3	4
	b.	List down six matrix operations using MATLAB command. Give an example for each	CO 1	4

	c.	1. Given the following matrices, show the results generated by these MATLAB command A.*I. (a) I = eye(2) (b) A = [1 2; 2 3]
		
		2. Show the results generated by the following MATLAB command. y = [2.1 3.8; 8.5 5.1; 4.7 9.2]; (a) maxy = max(y)
		
		3. True/False (circle your choice):
		a. T F The final step of the Engineering Problem-SolvingMethodology is algorithm development.
		b. T F The semicolon (;) suppresses output when used with MATLAB commands
		c. T F The transpose operator (T) interchanges the rows and columns of a matrix.
		d. T F The disp command pauses a MATLAB program and prompts for input
		
		4. The following MATLAB statements contain an error, state what the cause of the error is and correct the statement:
		i. a = [1 2 3]; b = [4 5]; c = a + b;
		ii. i = 1:10; i(2:4) = [4 3];
		iii. a = [1 2 3]; b = [4 5 6]; a*b;
			CO 1	4

	d.	Evaluate the following MATLAB expressions manually to check the answers a. 2/ 2 * 3; b. 6 - 2 / 5 + 7 ^ 2 – 1; c. 10 /2\5 - 3 + 2 * 4; d. 3 ^ 2 /4; e. 3 ^ 2 ^ 2; f. 2 + round(6 /9 + 3 * 2) / 2 – 3; g. 2 + floor(6/9 + 3 * 2) / 2 – 3; h. 2 + ceil(6 / 9 + 3 * 2) /2 – 3	CO 1	4
	e.	Given that x = [1 5 2 8 9 0 1] and y = [5 2 2 6 0 0 2], execute and explain the results of the following commands: a. x > y; b. y < x; c. x == y; d. x <= y; e. y >= x f. x | y; g. x & y; h. x & (~y); i. (x > y) | (y < x) j. (x > y) & (y < x)	CO 1	4

3.	a.	In each of the following questions, evaluate the given MATLAB code fragments for each of the cases indicated 1. if 0 < x < 10 y = 4*x elseif 10 < x < 40 y = 10*x else y = 500 end a. x = -1 y = ? b. x = 5 y = ? c. x = 30 y = ? d. x = 100 y = ? 2. if n > 1 m = n+1 else m = n - 1 end a. n = 7 m = ? b. n = 0 m = ? c. n = -10 m = ?	CO 2	4
	b.	Explain in detail about how loops and nested loops are useful in MATLAB programming. List down the rules for execution	CO 2	5
	c.	Given the following Matlab code, k= 0; while k ^0.5 < k; k = k + 1; end; k what is the value of k after executing the code ? (A) 0; (B) 1; (C) 2; (D) 3; (E) 4	CO 2	2
	d.	What is the output of executing the following Matlab code? for i=1:5; for j=i:5 ; M(i, j) = i+j; M(j, i)= M(i,j); end; end; M(4, 3)	CO 2	5

	e.	How many times will the display command in the following script be executed?
		x = 3;
		while (x < 8)
		disp('Am I done yet?')
		x = x + 2.5; end
			CO 2	4

		(OR)		
4.	a.	In order to print formatted integers with the following format, 00005 00006 00007 00008 00009 00010 which fprintf statement should be used in the following code? for i=5:10 fprintf( ) end (A) fprintf('%5.5f\n', i); (B) fprintf('%5.2d\n', i); (C) fprintf('%05d', i); (D) fprintf('%5.5d\n', i); (E) fprintf('%d\n', i)	CO 2	2
	b.	Using nested for-loops to generate a matrix that has elements shown below (without typing the numbers explicitly): A=[12 8 4 0 −4; 14 10 6 2 −2; 16 12 8 4 0]	CO 2	5
	c.	Write in detail about how switch statement can be used in programming in MATLAB (with example).	CO 1	5
	d.	Using one if-statement to rewrite the following nested if-statement if w < x if w > y w = x*y end if end if	CO 1	3
	e.	Create a simple multiple input dialog in MATLAB that requests two strings to be input and outputs the concatenation of the two strings	CO 3	5
5.	a.	Write the program code for importing excel data into MATLAB.	CO 3	3
	b.	Write short notes on following commands	CO 2	6

		a. Menu command b. Keyboard c. Return d. Input		
	c.	Differentiate between script file and function file	CO 2	3
	d.	Suppose that column one in the following file, RAIN.TXT, contains the daily rainfall for one week, and the second column contains the average rainfall for the week. 0.100000 0.694286 1.000000 0.694286 0.000000 0.694286 0.200000 0.694286 3.560000 0.694286 0.000000 0.694286 0.000000 0.694286 Write a MATLAB prorgram that will 1. Read the contents of RAIN.TXT into MATLA 2. Plot a histogram of the daily rainfall measurements and a horizontal line for the average weekly rainfall	CO 2	5
	e.	Write a function file for finding out factorial of a number	CO 3	3
		(OR)		
6.	a.	Explain in detail about formatted input and output statements with example	CO 2	10
	b.	Write down the rules for writing the function file. Explain with an example	CO 2	6
	c.	Given the following matrix, show the results generated by the MATLAB command. R = [1.22 3.78 2.41]; fprintf('R = %3.1f \n', R)	CO 1	2
	d.	Differentiate between user function and inbuilt function. Give an example	CO 1	2
7.	a.	What is GUI in MATLAB?	CO 3	2
	b.	List down any five uicontrol objects and explain how they are created in MATLAB.	CO 3	8
	c.	How the formatted plot can be created?	CO 3	5
	d.	Which MATLAB command generates a two-dimensional representation of a three-dimensional surface? a. mesh(z)b. pie(x) c. contour(z) d. figure(n)	CO 3	1
	e.	List down any four 3D plot commands with an example	CO 2	4
		(OR)		
8.	a.	Write a MATLAB script file that will plot and label the function $z = f(x, y) = [e^{-x2-y2} \cdot \sin(y) \cdot \sin(y)]$ over the domain $-2 \le x \le 2$ and $-2 \le y \le 2$	CO 2	4
	b.	Write down any six 2D plot commands with example	CO 2	8
	c.	List down different line specifiers with example	CO 2	4
	d.	Write a MATLAB program to prompt the user for a time constant τ and a max time T, then generate a plot of $v = e^{-t/\tau}$.	CO 3	4
		<u>Compulsory:</u>		
9.	a.	Write short notes on 1. Algorithm 2. Pseudo code 3. Flowchart 4. Data types in MATLAB	CO 1	10
	b.	List down the rules for variables and string constants	CO 1	5
	c.	Explain how the water balance study can be done using MATLAB progamming	CO 3	5

ALL THE BEST