LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **MATHEMATICS**

FIFTH SEMESTER – **APRIL 2023**

UMT 5504 – MATHEMATICAL TOOLS FOR ANALYTICS

Date: 08-05-2023   Dept. No.   Max. : 100 Marks
Time: 01:00 PM - 04:00 PM

PART – A

Q. No | **Answer ALL questions** | **(10 x 2 = 20 Marks)**

Q. No	
1	Differentiate between clc and clear command in MATLAB.
2	Write the use of the left division \ and right division / in MATLAB.
3	Write any four commands used for formatting a plot.
4	Write the commands to plot the given data in MATLAB.

Year	1988	1989	1990	1991	1992	1993	1994
Sales	8	12	20	22	18	24	27

Q. No	
5	Write the form of the function definition line.
6	Write any two cure fitting functions other than polynomials and their equivalent MATLAB command.
7	Write a MATLAB commands to find the roots of the polynomial $f(x) = x^6 - 2x^5 - 39x^4 + 20x^3 + 404x^2 + 192x - 576$.
8	Write the syntax and use of the **view** command.
9	Differentiate between findsym(S) and findsym(S , n) commands.
10	Define data structure and cell arrays.

PART – B

Answer any FIVE questions   **(5 x 8 = 40 Marks)**

11	a	Write the rules to be followed to define a variable in MATLAB.	5
	b	Differentiate between $rand, randi$ and $randn$ command and give examples.	3
12		Explain the following with by giving examples: a) Adding elements to a vector. b) Adding elements to a matrix. c) Deleting elements in a vector and a matrix.	3 +3+2
13	a	Write the various ways by which input can be given to a script file with an example.	4
	b	Write the format of disp and fprintf command and differentiate between them.	4
14		Explain the if-end structure and the if-else-end structure with a flow chart.	8
15	a	Briefly explain local and global variables.	4

	b	Write the similarities and differences between script and function files.	4
16	a	Write the three steps involved in creating the mesh and surface plot.	4
	b	Write the steps involved for creating a 3D plot of a function in which the value of z is given in polar coordinates.	4
17		Write in detail about creating symbolic objects and symbolic expressions in MATLAB.	8
18		Explain the following data structure in MATLAB. i) Categorical arrays. ii) table array.	8

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PART – C

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Answer any TWO questions   **(2 x 20 = 40 Marks)**

19		Write the syntax and give one example to perform the following: (i) Creating a vector from a known list of numbers. (ii) Creating a vector with constant spacing the first term, the spacing and the last term. (iii) Creating a vector with linear (equal) spacing by specifying the first and last term, and the number of terms (iv) Creating a two dimensional array. (v) Creating a square matrix in which all the elements are zeros and a 4 by 3 matrix in which all the elements are equal to one.	20
20	a	What is plot and fplot command? Explain in detail.	10
	b	Explain the following structure with a flow chart. i) for end loop. ii) while – end loop.	10
21	a	Write the MATLAB commands to perform the following and give one example for each. i) Multiply two polynomials. ii) Divide two polynomials. iii) Derivative of a single polynomial. iv) Derivative of a product of two polynomial. v) Derivative of a quotient of two polynomial.	15
	b	Write the MATLAB command to determine the polynomial that has roots at $x = -0.7, x = 0.5, x = 1.4 \ and \ x = 5.8$ and plot in the domain $-1 < x < 6$.	5
22	a	Explain the following commands with examples. i) collect ii) expand iii) factor iv) simplify v) pretty	10
	b	Define structures and write the procedures for creating and modifying structure variables.	10

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