LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

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

FIFTH SEMESTER – **NOVEMBER 2024**

UMT 5504 – MATHEMATICAL TOOLS FOR ANALYTICS

Date: 18-11-2024 Dept. No. Max. : 100 Marks

Time: 09:00 am-12:00 pm

	SECTION A - K1 (CO1)	
	Answer ALL the Questions -	**(10 x 1 = 10)**
1.	**Answer the following**	
a)	Differentiate between format compact and format loose command in MATLAB.	
b)	Write the command to create multiple plots on the same page.	
c)	Give one example for a function definition line that has one input arguments and two output arguments.	
d)	Write the use of the view command in MATLAB.	
e)	Write the use of the char function.	
2.	**Fill in the blanks**	
a)	_____ Window is used in MATLAB to create and debugs script and function files.	
b)	The MATLAB built-in function that is equivalent to the logical operator $A \wedge B$ is _____.	
c)	The first executable line in a function file must be the _____.	
d)	The command that is used to solve differential equation is _____.	
e)	The function used to remove a field a from the structure is _____.	
	SECTION A - K2 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
3.	**MCQ**	
a)	The command that is used to generate uniformly distributed random numbers with values between 0 and 1 is i. randi ii. rand iii. randn iv. none of these	
b)	When used in the fprintf command, the %g is used as the…… a. single character display b. fixed point display c. default number display d. none of the above	
c)	The variables in the function files are …… a. global b. Local c. constant d. none of the above	
d)	The ……controls the direction from which the plot is viewed. i. help command ii. surf command iii. mesh command iv. view command	
e)	The command used to refer to the contents of an element in a matrix is……. a. cellrowvec b. cellcolvec c. cellmat d. none of above	
4.	**True or False**	
a)	In MATLAB Axes command is used to add text label to x-axis.	
b)	There can be multiple decision variables for while loop.	
c)	The value of a polynomial at a point x can be calculated with the function polyval.	
d)	fplot(S) can be used to plot symbolic expression.	
e)	Curly braces are used to create cell array.	
	SECTION B - K3 (CO2)	
Answer any TWO of the following		**(2 x 10 = 20)**

5.	a. Write the rules to be followed for variable name in MATLAB. b. Explain how colon (:) is used to address a range of elements in a vector and in matrix.	(3 marks) (7 marks)

6.	a. Explain in detail the various commands used for formatting a plot. b. Draw the structure of the if- else- end structure and explain.	(5 marks) (5 marks)
7.	a. Write the difference between script files and function files. b. Explain the various methods that MATLAB uses to do interpolation.	(5 marks) (5 marks)
8.	a. Write the steps involved in creating mesh and surface plots. b. Explain how symbolic differentiation and symbolic integration is carried out with an example.	(6 marks) 4 Mark

SECTION C – K4 (CO3)

Answer any TWO of the following **(2 x 10 = 20)**

9.	Briefly explain the following with a diagram. a. switch-case STATEMENT. b. for-end Loops.	(5 +5)
10.	How will you create anonymous function in MATLAB? a. Write one example for an anonymous function which has one independent variable. b. Write one example for an anonymous function which has two independent variables.	(5 + 5)
11.	a. How will you create a 3-D plot? Give one example. b. Explain the view command. Give one example.	(5+5)
12.	Explain the following: a. Creating cell arrays b. Displaying cell array elements c. Storing strings in the cell array	(4+3+3)

SECTION D – K5 (CO4)

Answer any ONE of the following **(1 x 20 = 20)**

13.	a. Write the structure of the if-elseif-else-end conditional statement and explain how it works. b. i. Write the built-in function to find the value of a polynomial in MATLAB. Give example. ii. Write the built-in function to find the root of a polynomial in MATLAB. Give example. iii. Write the built-in function to multiply two polynomials. Give example. iv. Write the built-in function used to divide one polynomial by another polynomial. Give example. v. Write the built-in function that is used to find the derivative of a polynomial.	(10) (10 marks)
14.	a. Write the steps involved in polar coordinates grid in the xy plane. b. Write the syntax and use of the following commands with examples i. Findsym, ii. Collect iii. Expand iv. Factor	(8 marks) (12 marks)

SECTION E – K6 (CO5)

Answer any ONE of the following **(1 x 20 = 20)**

15.	a. Explain the following with an example i. Adding elements to a vector, ii. Adding elements to a matrix, iii. Deleting elements. b. Explain the three different ways in which the INPUT to a script file can be done in MATLAB.	(10 marks) (10)
16.	a. Write a brief note on input and output arguments in a function file. b. Given the function $z=1.8^{-1.5\sqrt{x^2+y^2}}\sin(x)\cos(0.5y)$ over the domain $-3\le x\le 3$ and $-3\le y\le 3$. Write	(5 marks)

	the commands to create the following: i. Mesh plot ii. Surface plot iii. Mesh Curtain plot iv. Waterfall plot v. 3-D Contour plot	(15 marks)

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