Hall Ticket Number:

Code No. : 14164 (G) N/O

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

B.E. IV-Semester Main & Backlog Examinations, July-2023

Mathematical Programming for Engineers (OE-II)

Time: **3 hours** Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO/PSO
1.	Determine the content of array a = [1 2 3; 4 5 6; 7 8 9] a) a ([3 1], :) b) a (:, end)	2	1	1	1/3
2.	Distinguish between array multiplication and matrix multiplication.	2	1	1	2/3
3.	Distinguish between plot and stem	2	1	2	2/3
4.	Write MATLAB program to draw Pie plot to represent the given data A= [12 25 30 5 10]	2	1	2	2/3
5.	Describe about MATLAB array and discuss about the following functions with examples used in MATLAB program: (i) zeros () (ii) eye ()	2	1	3	1/3
6.	Explain about Eigen values and Eigen vectors	2	1	3	2/3
7.	Write a MATLAB code to find the roots of the equation $x^4-4x^3+2x-5=0$	2	1	4	1/3
8.	Give the importance of @(x) and fsolve functions	2	2	4	2/2
9.	What is the syntax for using the ode23 function in MATLAB to solve a first-order ODE?	2	1	4	1/2
10.	How can you define callback functions for GUI components in App Designer?	2	2	5	2/2
	Part-B (5 × 8 = 40 Marks)				
11. a)	write a MATLAB program by using if and else if that reads in a numerical grade and assigns a letter grade to it according to the following table: grade > 95 A 86 < grade ≤ 95 B 76 < grade ≤ 86 C 66 < grade ≤ 76 D 0 < grade ≤ 66 F	5	2	1	1/3

Contd... 2

b)	write a MATLAB program to find sum of even numbers between 0 to 30	3	2	1	1/3
12. a)	Write a user define MATLAB function to perform addition operation between to arrays and call the function to plot the resultant array	4	2	1	1/3
b)	In a chemical reaction the concentration level y of the product at time t was measured every half hour. The following results were found: t 0 .5 1.0 1.5 2.0 y 0 .19 .26 .29 .31 write a program to plot the data by labelling the axis	4	3	2	2/3
13. a)	Solve the given equations by using Gauss Elimination Method -3x+2y-z=-1 6x-6y+7z=-7 3x-4y+4z=-6	4	3	3	2/2
b)	Write a MATLAB program to solve the set of linear system equations. $2x1+3x2-x3=1$ $x1+2x2-x3=4$ $-2x1-x2+x3=-3$	4	3	3	2/3
14. a)	Write a MATLAB code to Find the curve fitting for a given function y=4x+c where c is random noise of 50 samples by using polyfit and polyval	4	3	4	1/3
b)	Write a MATLAB code to find out the interpolation of given function $f(x)=x^2-4e^{-2x}$	4	3	4	1/4
15. a)	Apply Runge kutta Method to find out the approximation of y at x=0.2 if $dy/dx = 2x + 3y^2$ given that y=1 for x=0 with step size=0.1	4	4	4	2/2
b)	Write the MATLAB code to find out the output by using ODE45 dy1/dx = -y1 + y2 dy2/dx = y1 - y2 Initial conditions: y1(0) = 1 and y2(0) = 0, Integration interval: 0 <= x <= 5	4	3	4	2/3

Contd... 3

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16. a)	A=[1 2;3 4] B= [4 5;6 7] C=[2;3] What is the result of each of the following expressions? (a) a + b (b) a + c (c) a .* b (d) a + d	4	2	1	1/2
b)	The Placement record of Vasavi college of engineering is given below write a MATLAB code to represent the data graphically. Year 2017 2018 2019 2020 2021 2022 Placement Number 600 650 720 763 802 868	4	4	2	2/2
17.	Answer any ***two*** of the following:				
a)	Using Trapezoidal rule solve the integration $\int_0^3 2x/1 + x^2 = \pi r^2\, dx$ for N=10	4	3	3	1/2
b)	Solve the given equation $f(x)=x^3-4x-9$ by using Newton-Raphson Method	4	4	4	1/3
c)	Describe the steps required to create a GUI-based program in MATLAB by using designer APP	4	2	5	1/2

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	30%
iii)	Blooms Taxonomy Level – 3 & 4	50%

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