

B.E.(MEC), First Semester
ESC-X02: Computer Programming (MATLAB)

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.

x-x-x

- Q1. (a) How to find transpose of a matrix in MATLAB? 2*5=10
(b) Differentiate between scripts and functions.
(c) Write atleast two relational and logical operators in MATLAB.
(d) What is a nested loop?
(e) What is debugging process in MATLAB?

Section A

- Q2. (a) Use MATLAB to compute the total elapsed number of days in a year, given the month, the day of the month, and the value of extra day. 5
(b) What are the main components of MATLAB desktop? Discuss the purpose of each element. 5
Q3. (a) Write a program to find the smallest of given n numbers. 5
(b) Write a MATLAB program in a script file that determines and displays the first 20 Fibonacci numbers using for-end loop. 5
Q4. Write a script file to compute and display the sum of first ten terms of the series: 10
 $6n + 3n^2$, where $n = 1, 2, 3, \dots, 10$.

Section B

- Q5. (a) How do you find integration of a given polynomial using trapz and quad function? 5
(b) Describe *conv* and *deconv* commands with an example. 5
Q6. Write a program to plot the functions $y = \sin(x)$ and $y = 2\cos(x)$ in the interval $[0, 2\pi]$ in a single figure window. Also add axis labels and title to the plot. Illustrate how you would specify line styles, colors and markers for the two curves plotted on the same graph. 10
Q7. Use MATLAB to solve the following second order differential equation: 10

$$5 \frac{d^2 y}{dt^2} + 7 \frac{dy}{dt} + 4t = 0$$

Assume your own initial condition. Also write code to display the variation of y with t. Make use of labels along x and y axis on the plot.

x-x-x