2021
(JUNE)
MATHEMATICS
HONOURS

MAT-314

(Computational Mathematics Laboratory)
Theory

Full Marks: 50

The figures in the margin indicates full marks for the questions
Answer any ten questions.

1. Define variable. Explain any four system variables.   1+4=5

2. Define the following terms: 1x5=5

       i) workspace   ii) who

      iii) what   iv) which

       v) clear

3. Create a 3x3 matrix by concatenating 3 arrays. And write the command to access   3+2=5

       i) elements of 2nd row   ii) elements of 3rd column

4. Generate a 4x4 matrix. Do the following: 1x5=5

       i) write the command to insert 5th row

      ii) write the command to delete the 3rd column

      iii) write the command to flip left- right direction

      iv) write the command to filp up-down direction

       v) write the command to rotate the matrix 90 degree

5. Find the lower and and upper triangular matrix of a magic square matrix   2½ x 2=5

6. Define script file. Write a script file to find the difference of two variable and display the result.   1+4=5

7. Write a script file to find the compound interest. Display the answer using fprintf function.   5

8. Write a script file to plot the graph of the function y=3x+7. Label the x-axis, y-axis and give title.   5

9. Write the MATLAB command to solve the following system of linear equations by matrix operation: 5
   4x-2y+7z=5
   2x+8y+2z=10
   5x+6y+4z=8

10. Let A= [1 5 6;2 3 4;11 7 9; 3 4 5]. Write the output of the following command   5

        i) >> A(2,1)   ii) >> A(3,:)

       iii) >> A(2: 4,1: 2)   iv) >> A(1: 2,:)

        v) >> A(: , 1)

11. Explain the uses of beak and continue with examples.   5

12. Write a script file using for loop to print first n natural numbers. Take the value of n from user.   5

13. Define function file in MATLAB. Create a function file to display "WELCOME TO MATLAB".   1+4=5

14. Write a function file to compute mean and median of an input array.   5

15. Write the command to generate 3D plot for the given functions. Also label the axes and give a title. $x=t^2$ and y=4t where t= -3 to 10 with an interval 0.2.   5

16. Suppose A=[12 23 15 10;7 9 10 3;2 4 6 8; 10 7 5 6]. Append the average of each row and each columns as two extra rows.   5

17. Write a script file to display the result according to the marks score by a student. Take the mark from the user.   5

18. Write a script file to find the area of a circle and area of a triangle.   5

19. Plot the following two functions in a graph using subplot function.   5
$$y = e^{-1.5}x \sin(10x) \, and \, y = e^{-2}\sin(10x)$$

20. Write a script using while loop to find the sum of first n positive numbers which are divisible by 5.   5

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