Exam.Code:0906
Sub. Code: 6671

1058

B.E. (Mechanical Engineering)
Second Semester
ME-204: Computer Programming
(MATBAL Programming for Engineers)

Time allowed: 3 Hours

Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. I (Part-A)which is compulsory and selecting two questions each from Part B-C. Assume any suitable data, wherever not given.*

x-x-x

Part-A

1. (i) State the advantages and disadvantages of MATLAB compared to any other programming language (such as C).

   (ii) What are advantages of using functions?

   (iii) Which commands are useful in calculating the computational time spent by the processor in evaluating any function?

   (iv) Differentiate between data interpolation and extrapolation.

   (v) Compare the outputs of the commands "*help plot*" versus "*lookfor plot*".

(2 x 5 = 10 Marks)

Part-B

2. Write a MATLAB program to compute the age of a person in months, days, hours, minutes as well as seconds given her date of birth.

(10 Marks)

3. Write a user-defined MATLAB function ***TRIANGLE*** that determines the angle of a triangle when the lengths of the sides are given. Also write a MATLAB program which should call this function ***TRIANGLE*** to find out the angles in triangles with the sides defined by the user input.

(10 Marks)

4. Write a MATLAB program for following sequence of actions:
   (a) Create a matrix A of size 100x100 using random numbers.
   (b) Out of all the elements of A, find the largest and smallest elements along with element location / number / subscript.
   (c) Sort each column in A to create a new matrix B.

(10 Marks)

P.T.O

Part-C

5. Define the following function in MATLAB:

$$f(x, y, z) = x^2 e^y - 5z^2$$

Compute the integral with respect to x and also find second derivative with respect to z.

(10 Marks)

6. Write a program to plot two functions $y_1 = \sin(x)$ and $y_2 = \cos(x^2)$ as parts of same figure for values of x defined in such a way that x varies from 0 to 2*pi with an increment of pi/30. Also use commands to write titles of x-axis and y-axis. Also use commands to write legends in top right corner of the figure. Draw a sketch of the output figure.

(10 Marks)

7. Write a MATLAB program to demonstrate the use and applications of classes and object-oriented programming.

(10 Marks)

x–x–x