CLASS TEST-2

Subject: Introduction to Computing (EP-201) **B. Tech. (EP), 3rd Semester**

Date of Examination: 22-10-2020 **MM: 15**

Time: 45 minutes

Instructions

1. Solve the problems using the editor of Matlab/Octave.
2. In order to give the solution of the questions, paste the screen shot of the editor file and output shown in the command window **keeping in mind that it should be properly visible in the created pdf file**.
3. Follow the given format to write file name of the pdf file that you need to upload on classroom (**Roll no_first name 2K19/EP/39_aakash**)
4. Submit a Single pdf file mentioning your Name and Roll number at the top of the first page of the file.

Q.1 Write a function file of name **unique_element** that takes matrix **A** as input and find the indexing (row and column position) of that element of given matrix **A** whose value is greater than all the elements of its row and is lowest in its column. In order to check the result, pass the below mentioned matrix **A** in this function and find the indexing of that special element. Program should not be written specifically for this matrix, it should be a general program. **[5]**

$$A = \begin{bmatrix} 1 & 2 & 15 & 10 \\ 3 & 4 & 16 & 2 \\ 15 & 22 & 20 & 5 \\ 23 & 1 & 22 & 100 \end{bmatrix}$$

Q.2 Write a MATLAB/OCTAVE script file to create a special matrix of dimension *n*-by-*n* that has ones in the first row and first column, and whose remaining elements are the sum of two elements, the element above and the element to the left, if the sum is less than 40. Otherwise the element is the maximum of those two element values. The dimension of matrix should be user-controlled. Run the program and show the special matrix generated by this program of dimension 10-by-10. **[5]**

Q.3 The **(*x*,*y*)** coordinates of a certain object **A** as a function of time ***t*** are given by $x(t) = 5t-10$, $y(t) = 25t^2-120t+144$ for $0 \leq t \leq 4$ seconds in the interval of **0.1**.

Write a program to determine the time at which the object is closest to the origin at (0,0). Determine also the minimum distance.

Output should be properly displayed in the command window having text and numeric value together. **[5]**

**************BEST WISHES**************