

2021

ELECTRONICS — HONOURS

Paper : SEC-B-2

(Programming with Matlab/Scilab)

Full Marks : 80

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer **question no. 1** and **any four** from **Unit-I** and **any four** from **Unit-II**.

1. Answer **any ten** questions : 2×10
- (a) What is the use of the command window?
 - (b) When is a semicolon (;) used in a command line?
 - (c) What is the use of the function `namelengthmax`?
 - (d) What do the constants `Inf` and `NaN` stand for?
 - (e) What does the `format` command do?
 - (f) When are the format codes `%s` and `%e` used?
 - (g) What is the difference between the `clc` and `clear` commands?
 - (h) How to transpose a matrix in MATLAB/SCILAB?
 - (i) What does the `whos` command do and how is it different from the `who` command?
 - (j) What is the difference between the `floor` and `round` functions?
 - (k) What is Simulink?
 - (l) What is the use of the `subplot` command?

Unit – I

2. What does the name MATLAB/SCILAB stand for? What is the use of MATLAB/SCILAB? Name two free and open-source alternatives to MATLAB. 1+2+2
3. Name a few types of mathematical calculations that may be performed using MATLAB/SCILAB. Name the different windows belonging to the MATLAB/SCILAB environment that are displayed by default. What does the workspace window display inside itself? 2+2+1
4. How do you write single and multiline comments in MATLAB/SCILAB? How can long assignments be carried over to another line? How do you create a row vector and a column vector? 2+1+2

Please Turn Over

5. What is a matrix and how is it different from an array in MATLAB/SCILAB? How do you create a 3 by 3 matrix? What are .m script files and how are they run? (1+1)+1+2
6. Name a few data types in MATLAB/SCILAB. How can you convert an integer data type to a string data type? How are matrix arithmetic and array arithmetic operations distinguished? Explain with an example. 2+1+2
7. Name the Bitwise operators in MATLAB/SCILAB. Name the different types of loop used in MATLAB/SCILAB. Explain with an example how you can create a column vector with 7 elements and reference the 3rd element. 2+1+2

Unit – II

8. Name all the useful workspace available in MATLAB/SCILAB. How to define a **function** in MATLAB/SCILAB? Write a MATLAB/SCILAB code to convert Euros(e) in Dollars(d) with an Exchange rate(t) by the help of **function**. 3+2+5
 9. Write general syntax of **for** loop in case of MATLAB/SCILAB and explain. Write a MATLAB/SCILAB code to calculate 20 terms of a sequence defined by recurrence as : $u_1 = 4$ and $u_{n+1} = u_n + 2n + 3$. (2+3)+5
 10. What is nested loop? If there is more than one condition write the syntax of IF ELSEIF statements. A normal, average work day starts at 8:00 o'clock and ends around 16:00 o'clock. Depending on the daily activities work hours are designated as :
 - 8:00 – 10:00 Project Meetings
 - 10:00 – 12:00 Training
 - 12:00 – 12:30 Lunch Break
 - 12:30 – 16:00 Project Development
 - 16:00 – 8:00 Free Time
 Using IF ELSEIF statements write a MATLAB/SCILAB code which will display what activity is functioning on the current hour. 2+3+5
 11. What is disp() function? Display scalar, matrix, string and list type variable using disp() function with examples. 2+(2×4)
 12. Why we use poly() function in MATLAB/SCILAB? Write the syntax of poly() function and explain. With poly() function write a Scilab/Matlab code to display—
 - (a) The polynomial which has the roots as : $x^1 = -1$ and $x^2 = 2$
 - (b) The polynomial which has the coefficients as : $a_0 = 3$, $a_1 = -3$, $a_2 = -8$ and $a_3 = 7$. 1+(2+3)+(2+2)
 13. Briefly explain the method to plot a surface in MATLAB/SCILAB. Write a MATLAB/SCILAB code to plot the surface $z = 2x^2 + y^2$ (elliptic paraboloid). 5+5
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