2022

ELECTRONICS — HONOURS

Paper: SEC-B2

(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 questions from Unit-I and any four questions from Unit-II.

1. Answer any ten questions:

2×10

- (a) Is Scilab/Matlab case sensitive? Which one is correct— 'Sqrt (a)' or 'sqrt (a)'?
- (b) What are 'tie' and 'toc' funciton?
- (e) How to write 4+3i in console of scilab?
- When are the format codes % s and % e used?
- (e) How to transpose a matrix in Matlab/Scilab?
- What is simulink?
- (g) If $E = [5 \ 19 \ 15; \ 8 \ 22 \ 36]$, what is the output of E(1, 2)?
- (b) How do you create an identity matrix of dimension 3 by 3?
- What is the command used in Matlab/Scilab to extract the diagonal elements of a square matrix into a vector?
- If x = linspace (a, b, n), then define a, b and n.
- (k) In plot 2d(x, y), style = 3), write the purpose of style argument.
- What is the difference between the 'cle' and 'clear' commands?

Unit - I

2. Explain the following functions:

1+1+1+1+1

- linspace
- feval
- legend
- title
- x title

(2)



3. Discuss list and t list with appropriate example.

Write Scilab/Matlab code to create a custom function for generating Fibonacci sequence of n numbers.

Write a Scilab/Matlab code to find the grade of a student (Total marks = 100) given :

- Marks ≥ 80; print 'GRADE-A'
- Marks ≥ 60; print 'GRADE-B'
- Marks ≥ 40; print 'GRADE-C'
- Marks < 40; print 'FAIL!'
- 6. Discuss the '\$' operator. Write Scilab/Matlab code to print the following string in reverse order. 'I am a student of B.Sc. (Electronics)'.
- What does Matlab/Scilab stand for? What is the use of Matlab/Scilab? Name two open-source alternatives to Matlab.

Unit - II

Y. Use user-defined functions to compute the following:

(a) Display terms of A.T. series— AP (x, d, n);

where; $x \rightarrow$ first term

 $d \rightarrow$ common difference

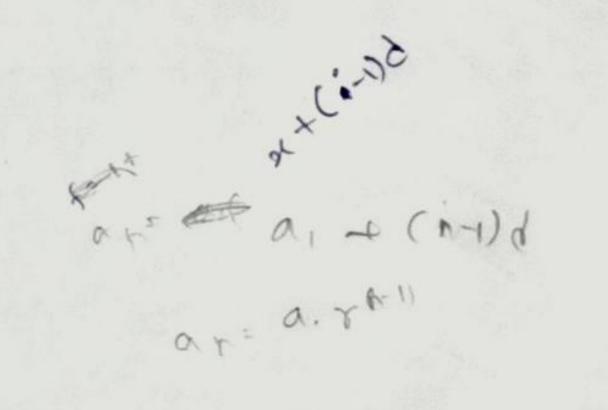
 $n \rightarrow \text{no. of terms}$

(b) Display term of G.P. series— GP (x, r, n);

where; $x \rightarrow$ first term

 $r \rightarrow$ common ratio

 $n \rightarrow \text{no. of terms.}$



5+5

Write the general format of 'for' loop in Matlab/Scilab. Write the Matlab/Scilab code to display the following:

*

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* *

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* * * *

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Jul. :

State the difference between poly () and roots () function in MATLAB.

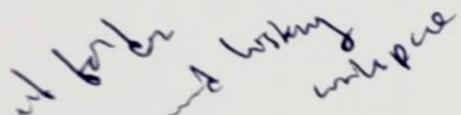
The co-efficients of a polynomial are given as:

$$a_5 = 3$$
; $a_4 = -2$; $a_3 = 2$; $a_2 = 10$; $a_1 = 6$; $a_0 = 13$.

Write the MATLAB code to display:

$$3x^5 - 2x^4 + 2x^3 + 10x^2 + 6x + 13$$
.

11. Briefly explain the method to plot a surface in MATLAB/SCILAB. Write the MATLAB/SCILAB code to plot the surface :



$$z = \frac{x^2}{4} - \frac{y^2}{9}$$

Write about the different workspaces available in MATLAB/SCILAB. Write the MATLAB/SCILAB code to convert Celcius (C) into Fahrenheit (F) by use of user-defined function.

5+5

13. Write a code in MATLAB to compute the following:

(a)
$$\sin^2(n) + \cos^3(n)$$
;

(b) $1 + \exp(n)$;



and plot the functions on the same graph, i.e. superimpose both the functions keeping the range of x same.

