

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' function?
- ~~(c)~~ How to write $4+3i$ in console of scilab?
- ~~(d)~~ When are the format codes %s and %e used?
- ~~(e)~~ How to transpose a matrix in Matlab/Scilab?
- ~~(f)~~ What is simulink?
- ~~(g)~~ If $E = [5 \ 19 \ 15; 8 \ 22 \ 36]$, what is the output of $E(1, 2)$?
- ~~(h)~~ How do you create an identity matrix of dimension 3 by 3?
- ~~(i)~~ What is the command used in Matlab/Scilab to extract the diagonal elements of a square matrix into a vector?
- ~~(j)~~ If $x = \text{linspace}(a, b, n)$, then define a , b and n .
- ~~(k)~~ In plot $2d(x, y, \text{style} = 3)$, write the purpose of style argument.
- ~~(l)~~ 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

function y =

a = 0
b = 1

a = b
a = 5
b = c

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(2)

3. Discuss list and t list with appropriate example.

5

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

5

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

5

- 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)'.

2+3

7. What does Matlab/Scilab stand for? What is the use of Matlab/Scilab? Name two open-source alternatives to Matlab.

1+2+2

Unit - II

8. 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

$n \rightarrow$ no. of terms

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

where; $x \rightarrow$ first term

$r \rightarrow$ common ratio

$n \rightarrow$ no. of terms.

5+5

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

5+5

```
*
* *
* * *
* * * *
* * * * *
* * * * *
```

0 1 1 2 3 5 8

10. 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 :

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

5+5

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

5+5

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

12. 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.

5+5

$$\frac{C \times 9}{5} = F - 32$$

$$F = \frac{9C}{5} + 32$$

$$C = \frac{5}{9} (F - 32)$$