2019

B.Sc.

4th Semester Examination

# ELECTRONICS (Honours)

## Paper - C10P

## (Signals and Systems)

## [Practical]

Full Marks : 20 Time : 3 Hours

*The figures in the margin indicate full marks.*
*Candidates are required to give their answers in their own words as far as practicable.*

Answer any *one* questions selecting it by a lucky draw.

1. Write a MATLAB program to generate any continuous time signal. Show the result.

2. Write a MATLAB program to generate any discrete time signal. Record the output result.

3. Write a MATLAB program to show the time shifting property of a signal. Show the output.

*[ Turn Over ]*

4. Write a MATLAB program to obtain the time scaling property of a signal. Show the output.

5. Write a MATLAB program to represent the signal $x(t) = 2e^{-2t}$ for an interval $0 \le t \le 2$. Show the result.

6. Write a MATLAB program to generate a unit step function, show the result.

7. Write a MATLAB program for the convolution of any two signals. Record the output.

8. Write a MATLAB program for Fourier series representation of any continuous time signal. Show the output.

9. Write a MATLAB program for Fourier transform of unit step function. Show the result.

10. Write a MATLAB program for Laplace transform of sin(at). Show the result.

11. Write a MATLAB program for Laplace transform of cos(at). Show the result.

12. Write a MATLAB program to find the Fourier Transform of $\delta(n)$. Show the result.

13. A continuous time signal $x(1)$ is sampled with a sampling period of 0.4 seconds between each sample.

The first sample is at $t = 0$, total 10 samples are there. Sampled values are tested below :

| Time | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| Amplitude | 0 | 5 | 3 | −3 | 4 | −6 | −9 | 4 | 3 | 2 |

Plot the signal.

14. Perform convolution of two rectangular pulse. Show the convolution procedure step by step.

15. Let a system with the difference equation

$$y(n) = x(n) + 2x(n-1)$$

Find and plot the impulse response of the systems.

**Distribution of Marks**

| | | |
|---|---|---|
| Experiment | — | 15 |
| Laboratory Note Book | — | 02 |
| Viva-voce | — | 03 |
| Total | | 20 |