Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Electronics & Communication Engineering) (Sem.–4)

SIGNALS AND SYSTEMS

Subject Code : BTEC/403/18

M.Code : 77568

Date of Examination : 17-05-2024

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Write briefly :

(a) Define even and odd signals with the help of suitable example.

(b) Differentiate between continuous and discrete amplitude signals.

(c) What do you mean by differential and difference equations?

(d) Check the system $y(t) = t\,x(t)$ for linearity.

(e) Write down the equations for Fourier Series and Fourier Transform pairs.

(f) Explain the integration property of Fourier Transform.

(g) What is difference between Discrete Fourier Transform (DFT) and Discrete Time Fourier Transform [DTFT]?

(h) Write down any two properties of ROC.

(i) Define mean, median and standard deviation.

(j) Explain system stability with an example.

SECTION-B

2. Determine the fundamental time period of the following signal if periodic

$$x(t) = 4 \sin (o.8\pi t + \frac{\pi}{4} + 3\cos (0.6\pi t + \frac{\pi}{6})$$

3. Classify different types of systems and explain causal/non-causal system in brief.

4. Find the Fourier transform of the following signal

$$x(t) = e^{-a|t|}$$

5. Write a short note on poles-zeros representation of a system.

6. Calculate the convolution of the following signals by using z-transform

$$x_1[n] = \{1,2,1\} \text{ and } x_2[n] = \{1, -2,3,4\}$$

SECTION-C

7. Explain various properties of Fourier Transform in detail.

8. Explain the Unit step response and Impulse response of a system. Also, discuss the relationship between them.

9. Describe the sampling theorem and aliasing with the help of suitable diagrams.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.