



INSTITUTE OF AERONAUTICAL ENGINEERING (Autonomous)

B.Tech IV Semester End Examinations (Regular), November – 2020

Regulation: IARE–R18

SIGNALS AND SYSTEMS

(ECE)

Time: 2 Hours

Max Marks: 70

Answer any Four Questions from Part A
Answer any Five Questions from Part B

PART – A

1. Explain the various continuous time systems with examples. [5M]
2. Bring out the relationship between trigonometric and exponential Fourier series . [5M]
3. Describe the relationship between bandwidth and rise time. [5M]
4. State and explain any three properties of z transform. [5M]
5. Write short notes on aliasing and band pass sampling. [5M]
6. Enumerate the properties of orthogonal and complex functions. [5M]
7. State and explain any three properties of Fourier Series. [5M]
8. Discuss the properties of Fourier convolution with respect to time domain and frequency domain. [5M]

PART – B

9. Write briefly about the following basic signals with graphical representation i) Unit impulse Signal ii) Unit Step Signal iii) Ramp Signal iv) Sinusoidal signal. [10M]
10. Define a complete set and hence show that the error can be minimized when the function $f(t)$ is approximated by an 'n' set of orthogonal functions. [10M]
11. Justify the following statement with respect to Fourier Series: Even functions have only cosine terms. [10M]
12. Obtain the Fourier transform of impulse function, step function and signum function. [10M]
13. Comment on the requirements to be satisfied by an LTI system to provide distortionless transmission of a signal. [10M]
14. Determine the convolution of two signals $x(n) = \{ 1, 1, 0, -1, -2 \}$ and $h(n) = \{ 1, -3, 4, 5 \}$. [10M]
15. Determine the initial value and final value of Laplace transform of signal $X(s) = (2s+5)/(s(s+3))$. [10M]
16. Obtain the inverse z-transform of $X(z) = [1 / (1 + z)] + [2z / (z - 0.2)]$ [10M]
17. State and prove Sampling theorem and hence explain impulse sampling. [10M]
18. Compare the merits and demerits of performing sampling using natural, impulse and flat top sampling techniques. [10M]