

Reg. No:

--	--	--	--	--	--	--	--	--	--

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations July-2021

SIGNALS & SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

- | | | | |
|---|---|------------------------------------------------------------------------------------------------------------|----|
| 1 | a | Define causal and non-causal systems. | 2M |
| | b | What is the Relationship between exponential Fourier series and trigonometric Fourier series coefficients? | 2M |
| | c | What is the Relation between unit step and impulse response? | 2M |
| | d | What are the Properties of ESD? | 2M |
| | e | What is the Laplace Transform of Parabolic Function.? | 2M |

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

- 2 Explain the classification of signals in both continuous time and discrete time with suitable examples. 10M

OR

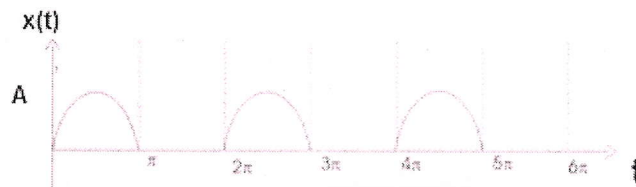
- 3 Check whether the following system is
- | | | |
|---------------------------|------------------------------------|-----|
| (a) Static or dynamic | (b) linear or non- linear | 10M |
| (c) Causal or non- causal | (d) Time invariant or time variant | |
- (i) $d^3y(t)/dt^3 + 2d^2y(t)/dt^2 + 4 dy(t)/dt + 3y^2(t) = x(t+1)$
- (ii) $d^2y(t)/dt^2 + 2y(t) dy(t)/dt + 3ty(t) = x(t)$

UNIT-II

- 4 State and Prove any Five Properties of the Fourier Series. 10M

OR

- 5 Find the Fourier series expansion of the half wave rectified sine wave shown in figure. 10M



UNIT-III

- | | | | |
|---|---|---------------------------------------------------------------------------------|----|
| 6 | a | Explain the Filter characteristics of linear systems explain with neat diagrams | 5M |
| | b | Derive the transfer function and impulse response of an LTI system | 5M |

OR

- 7 Signal $x(t) = 2 \cos 400\pi t + 6 \cos 640\pi t$ is ideally sampled at $f_s = 500$ Hz. If the sampled signal is passed through an ideal LPF with a cut off frequency of 400Hz, what frequency components will appear in the output? Find the output signal. 10M

UNIT-IV

- | | | | |
|---|---|-----------------------------------------------------------------------|----|
| 8 | a | State and prove the time convolution theorem with Fourier transforms. | 5M |
| | b | State and prove the Parseval's theorem for power signals | 5M |

OR

- | | | | |
|---|---|---------------------------------------------------------------------------|----|
| 9 | a | Show that R(r) and ESD form Fourier transform pair. | 5M |
| | b | State and prove the frequency convolution theorem with Fourier transforms | 5M |

UNIT-V

- 10 a Find the inverse Z-transform of $X(z) = z^{-1} / (3 - 4z^{-1} + z^{-2})$, ROC: $|z| > 1$ 5M
- b Find the convolution of the sequences 5M
 $x_1(n) = (1/2)^n u(n)$ and $(1/3)^{n-2} u(n)$

OR

- 11 State and prove the any five Properties Laplace Transform 10M

END