Q.P. Code: 19EC0403 **R19**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations December-2021

SIGNALS, SYSTEMS AND RANDOM PROCESSES

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

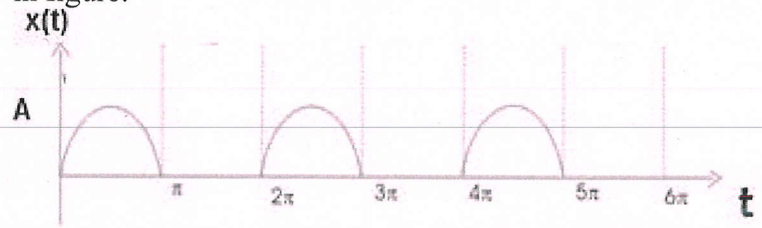
1	a	Define various elementary signals and indicate them graphically	L1	6M
	b	Find the Even and Odd Component of the signals below (i) $x(t)=e^{j2t}$ (ii)x(n)={-3,1,2,-4,2}	L3	6M

OR

2	a	Discuss about Energy and Power signals	L6	6M
	b	Determine whether the following systems are stable or not. (i) y(t)= (t+5) u(t) (ii) $h(n)=a^n$ for $0<n<11$	L3	6M

UNIT-II

3		Construct the Fourier series expansion of the Half wave rectified sine wave shown in figure.	L6	12M



OR

4	a	State and Prove Linearity, Time Reversal Properties of Fourier Series.	L5	6M
	b	State and Prove Time Shifting and Time Convolution Properties of Fourier Series	L5	6M

UNIT-III

5	a	Explain the Filter characteristics of linear systems and explain with neat diagrams	L2	6M
	b	Define the following (i)Impulse Response (ii)Step Response (iii) Response of the System	L1	6M

OR

6	a	Explain the procedure to perform convolution Graphically	L2	6M
	b	Examine the convolution of the following signals by graphical method $x(t)=e^{-3t}$ u(t) and h(t)=u(t+3)	L4	6M

UNIT-IV

7		State and prove the any four Properties Laplace Transform	L6	12M

OR

8	a	Explain the concept of random variable	L2	6M
	b	Examine the distribution function $F_{xx}(x,y)$	L1	6M

(X,Y)	(0,0)	(1,2)	(2,3)	(3,2)
P(x,y)	0.2	0.3	0.4	0.1

UNIT-V

9		Define Auto Correlation Function. State and explain any four properties of ACF	L2	12M
		OR		
10	a	Briefly explain the concept of Random process.	L2	6M
	b	Prove that the PSD of the derivative X(t) is equal to ω^2 times the PSD of Sxx(ω).	L6	6M

*** END ***