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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR (AUTONOMOUS) B.Tech II Year I Semester Regular Examinations Feb-2021 SIGNALS, SYSTEMS AND RANDOM PROCESSES (Electronics and Communication Engineering) Time: 3 hours (Electronics and Communication Engineering) Time: 3 hours (Answer all Five Units 5 x 12 = 60 Marks) UNIT= 1 a Explain the classification of signals in continuous time with suitable examples. (Answer all Five Units 5 x 12 = 60 Marks) UNIT= 1 a Explain the classification of signals in continuous time with suitable examples. (i) x(t)= $e^{2t}u(t-1)$ (ii) x(n)= $u(n+4)-u(n-2)$ OR 2 a Check whether the following system is (i) Static or dynamic (ii) Linear or Non- Linear dy(t)/dtx+2dzy(t)/dtx+4dy(t)/dt+3y2(t)=x(t+1)) b Sketch the following signals (i) x(t)== $u(t-2) - 2u(t-3)$ (ii) x(t)= $u(t-1) - u(t-1) - u(t-3) + u(t-4)$ UNIT-II 3 a State and Prove Time Shifting and Time Convolution Properties of Fourier Series. 4M D 4 a Find the Fourier transform of the following (i) x(t)= $u(t-1)$ (ii) x(t)= $u(t-1)$ 5 a Explain the procedure to perform convolution Graphically. b Discuss about Dirichlet's Conditions. D UNIT-III 5 a Explain the procedure to perform convolution Graphically. 6 M b Examine the convolution of the following signals by graphical method x(t)= $e^{-3t}u(t)$ and h(t)= $u(t+3)$ 6 R 6 a Consider a stable LTI System characterized by the differential equation dy(t)(dt+2y(t)=x(t), Find its impulse response. b Discuss the Howing (i) Transfer Function UNIT-IV 7 a Determine the Laplace transform of the signal x(t)= $e^{-4t}u(t) - e^{-4t}u(t)$ and also find its ROC. b Find the Laplace transform of the following signals (ii) $UD=e^{-4t}u(t)$ if in the Laplace transform of the follo	Reg	N	o:	-				MO ailida	iong b	aoisib	60.6	111240	7		
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(i) $x(t)=e^{-5t}u(t-1)$ (ii) $x(t)=e^{-a t }$		h	Find the	Laplace	transfor	ms and	d regio	n for tl	he foll	owing	signal	s		6M	
		~	(i) $x(t) = 0$	e^{-5t} u(t-1)			610	i) $x(t)$ =	$=e^{-a t }$		0			UT/L	

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		OR	
8	a	Explain about Joint and Conditional probability	6M
	b	State the properties of Joint & Conditional Probability.	6 M
		UNIT-V	
9	a	Explain the concept of power spectral density.	6M
	b	Discuss the properties of power spectral density.	6M
		OR	
10	a	Briefly explain the concept of Random process.	6M
	b	The power spectral density of a stationary random process is given by	6 M
		Sxx (ω) = A; -k < ω < k	
		0; otherwise. Find the auto correlation function.	

*** END ***