Total No. of Questions – [8]

Total No. of Printed Pages 3

G.R. No.	

Papers Code- U218-133 (BE-FF)

May 2019/ENDSEM
S. Y. B. TECH. (E&TC) (SEMESTER - I)

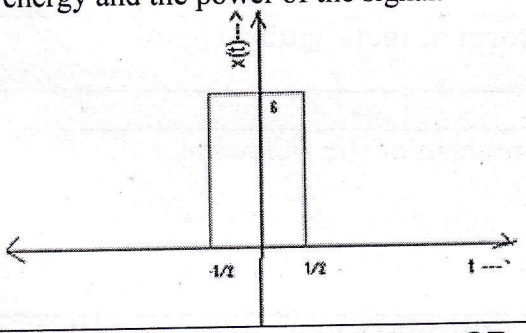
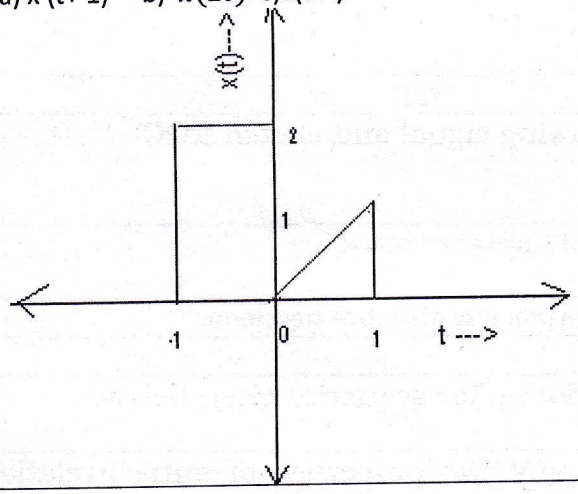
COURSE NAME: Signals & Systems **COURSE CODE: ETUA21173**

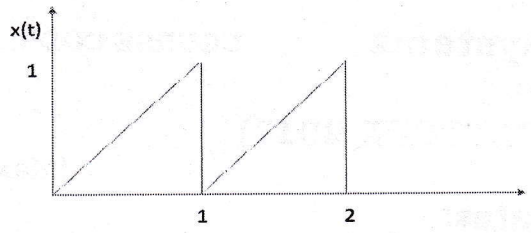
(PATTERN 2017)

Time: [**2 Hours**] [Max. Marks: **50**]

(*) Instructions to candidates:

1) **Answer Q.1, Q.2, Q.3, Q.4, Q.5 OR Q.6, Q.7 OR Q.8**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q. 1	a)	Find whether the following signal is an energy or a power signal and find the energy and the power of the signal. 	[6]
		OR	
	b)	The signals x(t) and y(t) are as shown in figure 1.93 and figure 1.94.Find the mathematically expression of signal and perform the following operations a) x (t+ 1) b) $x(2t)$ c)x(t-2) 	[6]
Q. 2	a)	Check whether following system is linear, time invariant, causal, stable. $y(t)= e^{tx(t)}$	[6]
		OR	

	b)	Check whether following system is stable , time variant, causal , static. $y(t)=x(0.5t)$	[6]
Q. 3	a)	Determine the exponential Fourier series of signal  	[6]
		OR	
	b)	Explain Dirichlet condition for existence of Fourier series.	[6]
Q. 4	a)	Using Fourier Transform properties find FT of following signal $X(t)= u(t) -u(t-4)$	[4]
		OR	
	b)	Determine Fourier transform of rectangular signal $x(t)= A\ rect(t/\tau)$	[4]
Q. 5	a)	Find inverse Laplace Transform of the following. $X(S) = 4/s^2+6s+8$ i)Re[s] >-2 ii) -2>Re[s] >-4 iii) Re[s] < -4	[6]
	b)	State and Prove time differentiation property of Laplace transform.	[4]
	c)	Find Laplace Transform of the following signal $x(t) = u(t) * u(t)$	[4]
		OR	
Q. 6	a)	Determine LT of following signal and sketch ROC. $y(t)=e^{-at} u(t)$	[6]
	b)	Find initial and final value of signal given below $X(S)=7s+10/(s)(s+2)$	[4]
	c)	State and prove convolution property of Laplace transform.	[4]
Q. 7	a)	Determine autocorrelation for sequence given below. $X[n]= \{0,1,2,3\}$	[6]
	b)	State and prove its any two properties of autocorrelation for power signal.	[4]
	c)	Write short note on correlogram	[4]
		OR	

Q. 8	a)	For CT signal $x(t) = e^{-4t}\, u(t)$, find (a)autocorrelation function (b)plot of autocorrelation (c) ESD and (d) plot of ESD.	[6]
	b)	Obtain cross correlation of following two sequences X1[n]= {2,3,4 } x2[n]={ 1,2,3 }	[4]
	c)	State properties of ESD for autocorrelation.	[4]