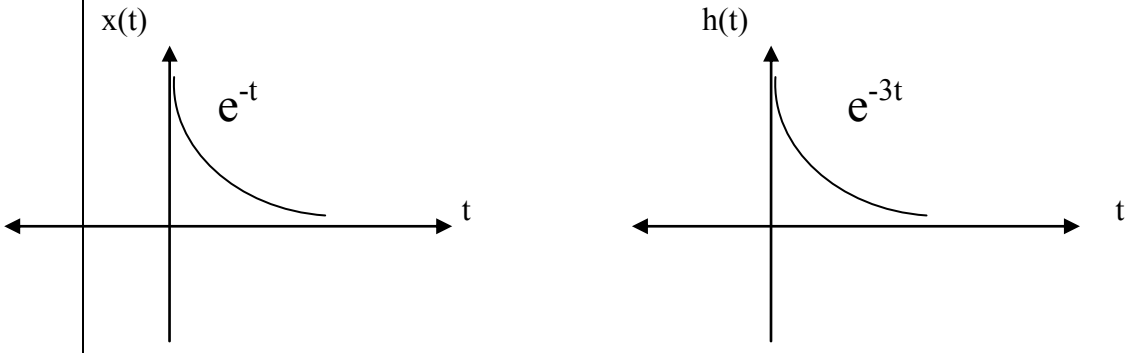
Total No of Questions: [06]		***SEAT NO. :***	
			[Total No. of Pages : 2]
		S.E. (E & TC)	
		(Signal & System) (204181) 2012 Pattern	
		(Semester - III)	
Time: 2 Hours			***Max. Marks : 50***

Instructions to the candidates:

1) ***Answer Q1 or 2, 3 or 4 and 5 or 6.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Use of Calculator is allowed.***
5) ***Assume Suitable data if necessary***
6)

Q.1)	a)	A discrete time signal is given below. Check for following system properties : 1. Static/Dynamic 2. Linearity 3. Causality 4. Stability y $(n) = 8\cos x(n)$	[6]
	b)	Sate and prove the convolution Integral property. With suitable block diagram & mathematical equation.	[3]
	c)	Find Y(n) discrete time signal convolution Integral. $X(n) = (u(n) - u(n-4))$ and $h(n) = \{1,1,1,1\}$	[3]
		OR	
Q.2)	a)	Find given signal is whether energy signal or power signal. Find its Value $x(t) = rect(t)$; for $t = -1$ to $t = +1$	[3]
	b)	Find the convolution of following signal. Plot Y(t)  	[6]
	c)	Find Even and Odd Components for given signal. x $(t) = 1 + 3t + 4\sin(t) + 6\cos(3t)$	[3]

Q.3)	a)	State and Prove the following property of Laplace Transform. i) Periodic Signal Property. i i) Time Scaling Property	[6]
	b)	Find the Quadrature Fourier series for the full wave rectifier output signal. With amplitude 'A' and period 0 to π.	[6]
		OR	
Q.4)	a)	Find the Initial Value and Final Value of the signal x(t) its Laplace Transform $X(S) = \frac{2S+3}{S^2+5S-7}$	[6]
	b)	Show that Rectangular function in time domain to become Sinc function in Frequency Domain.	[6]
Q.5)	a)	Determine the Auto Correlation Function Energy Spectral density of $x(t) = \cos\pi t\,[u(t+2)] - u[t-2]$ And sketch the Auto-correlation.	[10]
	b)	State the properties of Energy Spectral Density, Power Spectral Density, Autocorrelation and Cross Correlation.	[8]
	c)	Explain the properties of Probability, CDF and PDF.	[8]
		OR	
Q.6)	a)	The Probability density function of a random Variable 'x' is defined as $fx(x) = \begin{cases} Ke^{-4x} & x > 0 \\ 0 & x \leq 0 \end{cases}$ Find i) Constant ii) P (1 < x < 2) iii) P (x ≥ 3) iv) P(x < 1)	[10]
	b)	Draw and explain the following probability distribution model. i) Gaussian distribution Model. ii) Uniform Distribution Function.	[8]
	c)	Find Cross- Correlation of following discrete time signal. $x(n) = \{1,2,3,4\}$ and $y(n) = \{3,2,1,0\}$	[8]