Code No: R21044 $\boxed{R10}$ $\boxed{SET - 1}$

II B. Tech I Semester Supplementary Examinations, May/June - 2017
SIGNALS AND SYSTEMS
(Com. to ECE, EIE, ECC, BME)

Time: 3 hours   Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1.		Obtain the condition under which two signals f1 (t) & f2 (t) are said to be orthogonal to each other. Hence, prove that Sin nw_0t and Cos mw_0t are orthogonal to each other for all integer values of m, n.	(15M)
2.	a)	Find the exponential Fourier series and plot the frequency spectrum for the full wave Rectified sine wave with amplitude A and time period 2π?	(8M)
	b)	Explain the trigonometric Fourier series with necessary mathematical expressions	(7M)
3.	a)	State and prove the following properties of Fourier transform i) Multiplication in time domain ii) Convolution in time domain	(8M)
	b)	Find the Fourier Transform of the signal f(t) =e^{-2t}sgn(t)	(7M)
4.	a)	Explain how a signal is extracted from a noisy environment by using filtering technique	(8M)
	b)	Show that the product of *bandwidth* and *rise time* is constant.	(7M)
5.	a)	Write the properties of convolution and auto correlation?	(7M)
	b)	Find the total energy of the signal $x(t) = \frac{\sin (50t)}{2\pi t}$ using Parseval's equation	(8M)
6.	a)	State and prove sampling theorem for low pass signals. Also, explain the recovery of original signal from its sampled signal. Draw neat diagrams wherever necessary.	(8M)
	b)	Discuss the process of reconstructing the signal from its samples.	(7M)
7.	a)	When a function f(t) is said to be Laplace transformable? And compare Laplace and Fourier Transforms.	(7M)
	b)	Find the convolution of the signals x_1(t)=e^{-2t}u(t) and x_2(t)=e^{-4t}u(t) using convolution property of Laplace transforms.	(8M)
8.		for the given signal $x(n) = -b^n u(-n - 2) + 0.8^n u(n)$ a) Determine the parameter values for which Z-Transform will exist b) Find the Z-Transform c) Plot the ROC	(15M)