Code No: R21044 **R10** SET - 1

II B. Tech I Semester Supplementary Examinations, Oct/Nov - 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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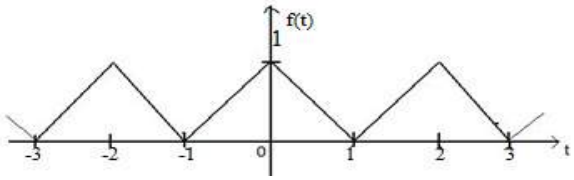
1 a) Sketch the following signals.
i. x(t) = r(t) ii. x(t) = r(-t+2) iii. x(t) = -2r(t) where r(t) is the ramp signal.
b) Discuss the Orthogonal Signal Space and obtain the expression for mean signal error.

2 a) State and prove the properties of Fourier Series

b) Find the exponential Fourier series for the following periodic function.



3 a) Find the Fourier transform of periodic signals

b) Obtain the Fourier transform of the following functions.
i. Impulse function δ(t).
ii. Unit Step function
iii. Signum function

4 a) What is Impulse Response? Show that the Response of an LTI system is convolution Integral of its impulse Response with input signal?

b) State and prove the relationship between bandwidth and rise time

5 a) List the properties of Cross correlation function

b) Give the relation between Auto correlation function and Power spectral density

6 a) With the help of graphical example explain sampling theorem for Band limited signals and also give the mathematical analysis
b) Compare impulse sampling, Natural and Flat top Sampling

7 a) State and prove Parsvels theorem in Laplace domain.
b) List the properties of ROC for Laplace transforms

8 a) State and prove the following properties of z-transform:
(i) Time scaling (ii) Conjugation

b) Find the inverse Z Transform of X(z) = 1/(1-0.5z-1 + 0.5z-2)
for ROC |Z| >1
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