

Code No: RT21044

R13**SET - 3**

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

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **THREE** Questions from **Part-B**

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**PART -A**

1. a) Define Unit step function and Signum function. (3M)
- b) Define aliasing effect? How can you overcome? (4M)
- c) What is meant by Total response? (3M)
- d) What are the properties of convolution? (4M)
- e) Define inverse Laplace transform. State the linearity property for laplace transforms. (4M)
- f) What is the time shifting property of Z transform (4M)

**PART -B**

2. a) Define the error function while approximating signals and hence derive the expression for condition for orthogonality between two waveforms  $f_1(t)$  and  $f_2(t)$  (8M)
- b) Obtain the Fourier series coefficients for  $x(t) = A \sin \omega_0 t$  (8M)
3. a) State and prove Differentiation and integration properties of Fourier Transform. (8M)
- b) What is the Significance of Hilbert Transform? Explain. (8M)
4. a) State and derive the relationship between bandwidth and rise time. (8M)
- b) What are the characteristics of ideal LPF and HPF (8M)
5. a) List the properties of Cross correlation function. (8M)
- b) Give the relation between correlation and Convolution (8M)
6. a) Determine the inverse Laplace of the following functions. (8M)  
i)  $1/s(s+1)(s+3)$  ii)  $3s^2 + 8s + 6 / (s+8)(s^2+6s+1)$
- b) Bring the equivalence between Laplace transform and Fourier transform (8M)
7. a) Find the inverse Z- transform of  $x(z) = \frac{1+3z^{-1}}{1+3z^{-1}+2z^{-2}}$  (8M)
- b) Give the relationship between z-transform ,Fourier transform and Laplace Transform (8M)