



Code No. : 5278/O

**FACULTY OF INFORMATICS**  
**B.E. 2/4 (IT) II Semester (Old) Examination, May/June 2012**  
**SIGNALS AND SYSTEMS**

Time : 3 Hours]

[Max. Marks : 75

**Note :** Answer **all** questions from Part A.  
Answer **any five** questions from Part B.

**PART – A**

**(25 Marks)**

1. Write the conditions for the existence of Fourier series. 3
2. Define and sketch the triangle function. 2
3. Relate Laplace transform with Fourier transform. 2
4. Write any 3 properties of Fourier transform. 3
5. Distinguish between power and energy signals. 3
6. Define aliasing. 2
7. State the properties of correlation. 2
8. List out properties of one-sided z-transform. 3
9. Derive transfer function of a new system when two systems are connected in cascade. 2
10. When a system is said to be BIBO stable ? Give an example. 3

**PART – B**

**(50 Marks)**

11. Explain time scaling, time shifting and limits of signals with suitable examples. 10
12. a) List out the properties of Laplace transform. 4  
b) Solve the following differential equation using Laplace transforms. 6

$$\ddot{y}(t) + 6\dot{y}(t) + 8y(t) = \dot{x}(t) + x(t)$$

$$\dot{y}(0) = 3, y(0) = 1, x(t) = u_s(t)$$



13. a) State Nyquist sampling theorem. 4  
b) Explain about coding and quantization. 6

14. a) Find the inverse z-transform of 4

$$x(z) = \frac{z}{(z - \frac{1}{2})(z - 1)} \text{ ROC } = |z| > \frac{1}{2}$$

- b) Explain about graphical convolution. 6

15. What are the properties of system ? Discuss them in detail. 10

16. a) Obtain cosine Fourier series starting from trigonometric Fourier series. 5  
b) Solve the difference equation 5

$$y(n+1) - \frac{1}{4}y(n) = \frac{1}{4}x(n)$$

$$y(0) = 0, x(n) = u_s(n)$$

17. Write short notes on :

- a) Amplitude and phase spectra. 3  
b) Addition, multiplication and scaling of sequences. 7