



Code No. : 6249

FACULTY OF INFORMATICS
B.E. 2/4 (IT) II Semester (Supplementary) Examination, December 2009
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. Define unit-step and unit-pulse functions. 2
2. Discuss about various classifications of signals. 3
3. Distinguish between energy and power signals. 3
4. What is ROC ? Find the ROC of the following Laplace transform. 2
$$X(s) = \frac{s+1}{(s+2)(s+4)}$$
5. Define aliasing. 2
6. Differentiate between coding and quantization. 3
7. Define the two-sided z-transform. 2
8. Draw the ROC of the discrete signal. 3
$$x(n) = a^n u_s(n) - b^n u_s(-n-1).$$
9. Check whether the system $y(n) = e^{x(n)}$ is linear or not. 3
10. Distinguish between auto correlation and cross correlation. 2

PART – B

(50 Marks)

11. Find all the 3 representations of Fourier series of a pulse train. 10
12. a) Define Laplace transform, and write any five properties of Laplace transform. 6
b) Define band width of a signal. Distinguish between base band, pass band and narrow band signals. 4



- 13 a) Explain Zero-Order-Hold sampling. 4
- b) Explain about addition, multiplication and scaling of sequences with examples. 6
14. a) Find the solution of the following difference equation. 6
- $$y(n+1) - \frac{1}{4}y(n) = \frac{1}{4}x(n) \quad y(0) = 0, x(n) = u_s(n).$$
- b) Find the z-transform of $(0.1)^n u_s(n) - 2^n u_s(-n-1)$ and sketch the ROC. 4
15. Explain various system representations. Derive all the 4 system representations of an RC network. 10
16. Find the solution of the following differential equation. 10
- $$\ddot{y}(t) + 7\dot{y}(t) + 10y(t) = x(t) \quad y(0) = 3, \dot{y}(0) = 2, x(t) = (1 - e^{-3t})y(t).$$
17. Write short notes on :
- a) BIBO stability. 3
- b) Convolution and correlation. 3
- c) Block diagram reduction. 4