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**Question Paper Code: 34044**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Fourth Semester

Electronics and Communication Engineering

01UEC404 – SIGNALS AND SYSTEMS

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Tell any two properties of linear time variant systems.
2. Differentiate between deterministic and random signal.
3. State Dirichelt's condition.
4. Explain about Parseval's theorem.
5. State and prove the differentiation property of Laplace transform.
6. State the condition for stability.
7. Prove the time shifting property of discrete time Fourier transform.
8. What is aliasing?
9. State the properties of ROC in Z transform.
10. List the advantages of the state variable representation of a system.

PART - B (5 x 16 = 80 Marks)

11. (a) Check whether the system  $\frac{d^3y(t)}{dt^3} + 4\frac{d^2y(t)}{dt^2} + 5\frac{dy(t)}{dt} + 2y^2(t) = x(t)$  is linear or non linear, causal or non-causal and time invariant or time variant. (16)

Or

(b) Explain the classification of signals in details. (16)

12. (a) Obtain the trigonometric Fourier series for the half wave rectified sine wave. (16)

Or

(b) Explain time and frequency convolution theorems associated with Fourier transform. (16)

13. (a) Realize the following system by direct form I, direct form II, cascade and parallel form  $H(s) = \frac{s(s+2)}{(s+1)(s+3)(s+4)}$ . (16)

Or

(b) Determine the inverse Laplace transform of  $F(s) = \frac{2s^2 + 3s + 3}{(s+1)(s+3)^3}$  and explain the state variable technique. (16)

14. (a) State and prove the time shift and frequency shift property of DTFT. (16)

Or

(b) State and explain sampling theorem and also explain the process of reconstruction of the signal from its samples. (16)

15. (a) Draw the block diagram for  $H(z) = \frac{1+2z^{-1}+4z^{-2}}{1-z^{-1}+2z^{-2}}$  using Direct form I. (16)

Or

(b) State and prove frequency shifting property of Z-Transform. (16)

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