

Roll No.

Total Pages : 2

BT-4/M-13

8411

SIGNAL AND SYSTEM

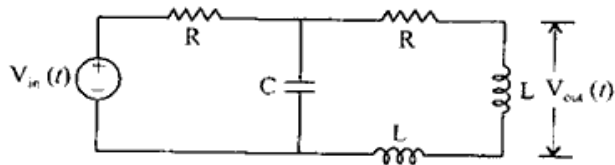
Paper : EE-208(E)

Time : Three Hours]

[Maximum Marks : 100

Note : Attempt any five questions. All questions carry equal marks.

1. (a) Differentiate between Time variant and Time invariant systems with the help of suitable examples and their mathematical models. How response is determined for deterministic signals ? 10
- (b) Obtain z-transform of the following :
 - (i) $te^{-\alpha t}$.
 - (ii) $\cos \omega t$. 10
2. (a) Define and prove Initial and Final value theorems of z-transform. 15
- (b) Discuss Causal and Non-causal systems. 5
3. (a) Obtain transfer function of the electrical circuit given below :



15

- (b) Differentiate between SIMO and MIMO systems with the help of suitable examples and their mathematical models. 5

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4. (a) Obtain state variable diagram of transfer function given as

$$\frac{(2s^2 + 5s + 6)}{(s^2 + 2s + 2)} \quad 10$$

- (b) List and explain characterisation of Stochastic signals. 10
5. (a) Discuss pdf and cdf. 10
- (b) Obtain impulse response of the system whose transfer function is given as

$$\frac{\omega_n^2}{(s^2 + 2\xi\omega_n s + \omega_n^2)} \quad 10$$

6. Write technical notes on the following :
 - (a) Correlation functions and Probability concepts.
 - (b) Analog and Discrete/Digital memory. (2×10=20)
7. (a) Differentiate between Deterministic and Stochastic systems. Give examples in each category and give their mathematical models. 10
- (b) Define State, State variable, State vector and State space. Also, differentiate between Transfer function models and State space models. 10
8. (a) Define and explain Convolution theorem. What is its utility ? Convolve two signals to exemplify convolution theorem. 15
- (b) Discuss effects of under sampling. 5

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