

# AMEL03 SIGNALS & NETWORKS

## UNIT-1 SIGNALS, SYSTEMS AND WAVEFORMS

- 1.1 Signals; Characteristics of Signals; Step, Ramp, and Impulse Functions (Signals)
- 1.2 Systems (Types of Networks)
- 1.3 Linear and Nonlinear Network (Systems), Time Invariant and Time Variant Networks,
- 1.4 Casual and Non-Casual Networks,
- 1.5 Passive and Active Networks, Lumped and Distributed Networks.

## UNIT-2 LAPLACE TRANSFORMS

- 2.1 Definition of Laplace Transform, Properties of Laplace Transform,
- 2.2 Inverse Laplace Transform,
- 2.3 Inverse Laplace Transform Using Partial Fraction Expansion,
- 2.4 Inverse Laplace Transform Using Convolution Integral.

## UNIT-3 APPLICATIONS OF LAPLACE TRANSFORMS

- 3.1 Laplace Transformation For Solving Differential Equations,
- 3.2 Application of Laplace Transform for Network Analysis,
- 3.3 Definition of System Function,
- 3.4 Impulse and Step Response of Networks.

## UNIT-4 NETWORK FUNCTIONS

- 4.1 Driving Point Functions,
- 4.2 Transfer Functions,
- 4.3 Poles and Zeros,
- 4.4 Necessary Conditions.

## UNIT-5 TWO PORT NETWORKS

- 5.1 Open Circuit Impedance Parameters or Z-Parameters,
- 5.2 Short Circuit Admittance Parameters or Y- Parameters,
- 5.3 Hybrid Parameters,
- 5.4 Transmission or ABCD Parameters,
- 5.5 Interrelationships between the Parameters,
- 5.6 Interconnection of Two Port Networks,
- 5.7 Input Impedance Interms of Two Port Parameters,
- 5.8 Output Impedance Interms of Two Port Parameters.

## UNIT-6 NETWORK TOPOLOGY

- 6.1 Graph of the Network; Graph Theory for Network Analysis
- 6.2 Network Equilibrium Equations On Loop or KVL Basis,
- 6.3 Network Equilibrium Equations On Node or KCL Basis;
- 6.4 Network Equilibrium Equations in Matrix Form
- 6.5 Mesh or Loop or KVL Equilibrium Equations,

6.6 Node or KCL Equilibrium Equations.

### **UNIT-7 DRIVING POINT SYNTHESIS**

7.1 Synthesis of Networks with Two Kinds of Elements;

7.2 LC-Driving Point Immittance Functions- Synthesis of L-C networks

7.3 RC Driving Point Immittance Functions-Synthesis of RC functions;

7.4 RL Driving Point Immittance Functions

7.5 Note about RL and RC Networks;

7.6 RLC Network Synthesis.

#### **Reference books:**

1. Electronics Device and Circuit ,Publisher Katsons, Writer Dr. J.B. Gupta
2. Network Theory , Publisher Katsons , Writer Dr. K.M Soni

