Fundamentals of Electrical Engineering

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Fundamentals of Electrical Engineering

Module-I: Introduction to Electrical Circuits

Circuit Concept: Basic definitions, Ohm's law at constant temperature, classifications of elements, R,L,C parameters, Standard symbols for electrical components, Fuses, independent and dependent sources, Kirchhoff's laws, Equivalent Resistance of series, Parallel and series parallel networks.

Module-II: Analysis of Electrical Circuits

Circuit Analysis: Source Transformation, Star to Delta and Delta to Star transformation, Mesh analysis and Nodal analysis by Kirchhoff's laws, inspection method, super mesh, super node analysis.

Module-III: AC Circuits

Single Phase AC Circuits: Representation of alternating quantities, Instantaneous, peak, RMS, average, form factor and peak factor for different periodic waveforms, phase and phase difference, 'j' notation, Concept of reactance, impedance, susceptance and admittance, rectangular and polar form. Concept of real, reactive, apparent power and complex power, power factor in single phase AC circuits consisting of R, L,C, RL, RC and RLC combinations.

Module-IV: Network Topology

Definitions, Graph, Tree, Incidence Matrix, Basic cut set and Basic Tie set Matrices for Planar Networks, Duality and Dual Networks.

Module-V: Network Theorems

Theorems: Tellegen's, Superposition, Reciprocity, Thevenin's, Norton's, Maximum power transfer and Milliman's and compensation theorems for DC excitations.

Fundamentals of Electrical Engineering

Module-I: Introduction to Electrical Circuits

Module-V: Network Theorems