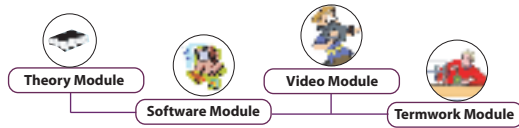


Electrical Circuits & Network

Introduces Global e-Learning System in Education & Training in the form of Learning Resources with Computer Aided Instructions



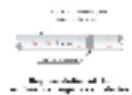
System Requirement:- IBM-PC Compatible with Window-OS, 128 MB RAM/Multimedia Kit

Theory module

Features : Theory, Figures, Photographs, Animations with controller, Highlighter tool, Note creation facility, Systematic page navigation, Printing facility, Access to Videos at appropriate locations.

List of Topics

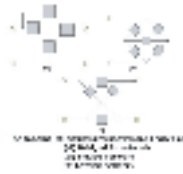
Development of the Circuit Concepts



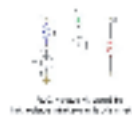
Introduction v, Charge and Energy, The Relationship of Field and Circuit Concepts
The capacitance Parameter, The Inductance Parameter, The Resistance Parameter,
Approximation of a Physical System As a Circuit

Conventions for Describing Networks

Reference Directions for Current and Voltage, Active Element Conventions,
The Dot Convention for Coupled Circuits, Topological Description of Networks.



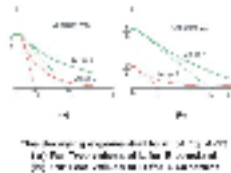
Network Equations



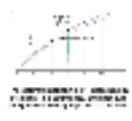
Kirchoff's Laws, The Number of Network Equations, Source Transformations, Examples
of the formulation of, Network Equations, Loop Variable Analysis, Node Variable Analysis
Determinants: Minors and the , Gauss Elimination Method, Duality,
State Variable Analysis.

First-Order Differential Equations

General and Particular Solutions, Time Constants , The Integrating Factor,
More Complicated Networks.



Initial Conditions in Networks



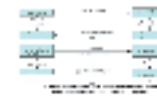
Why Study Initial Conditions?, Initial Conditions In Elements, Geometrical Interpretation
of Derivative, A Procedure for Evaluating Initial Conditions, Initial State of a Network.

Differential Equations Continued

Second-Order Equation; Internal Excitation, Higher-Order Equations; Internal, Excitation
Networks Excited By External Energy Sources , Response as Related to the S-Plane
Location of Roots, General Solutions In Terms of Q, and n.



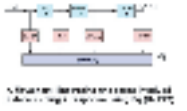
The Laplace Transformation



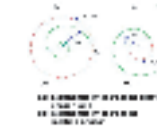
Introduction, The Laplace Transformation, Some Basic Theorems for the Laplace,
Transformation, Examples of the Solution of Problems with the Laplace, Partial Fraction
Expansion, Heaviside's Expansion Theorem, Examples of Solution By The Laplace
Transformation.

Transforms of Other Signal Waveforms

The Shifted Unit Step Function, The Ramp and Impulse Functions ,Waveform Synthesis
The Initial and Final Value of $f(T)$ From $F(S)$, The Convolution Integral, Convolution as a
Summation



Impedance Functions and Network Theorems



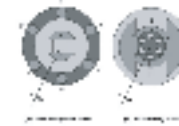
The Concept of Complex Frequency, Transform Impedance and Transform Circuits,
Series and Parallel Combinations of Elements, Superposition And Reciprocity,
Thevenin's Theorem and Norton's Theorem.

Resonance

Series Resonance , Impedance and phase angle of a Series Resonant Circuit, Voltages
and Current in a Series Resonant Circuit, Band Width of a RLC Circuit, The quality factor
(Q) and its effect on Bandwidth, Magnification i Resonance, Parallel Resonance, Resonant
Frequency for a Tank Circuit, Variation of Impedance with Frequency, Q Factor of Parallel
Resonance, Magnification, Reactance Curves in Parallel Resonance.



Polyphase Circuits



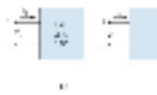
Polyphase System, Advantages of Three-Phase System, Generation of Three-Phase
Voltages, Phase Sequence, Inter Connection of Three-Phase Sources and Loads, Star
to Delta and Delta to Star Transformation, Voltage, Current and Power in a Star
Connected System, Voltage, Current and Power in a Delta Connected System, Three-
Phase Balanced Circuits, Three-Phase Unbalanced Circuits, Power Measurement in
Three-Phase Circuits.

Coupled Circuits

Mutual Inductance, Coefficient of Coupling, Ideal Transformer, Analysis of Multi-Winding
Coupled Circuits, Series Connection of Coupled Inductors, Tuned Circuits, Single Tuned
Circuit, Double Tuned Coupled Circuits.



Network Functions



Singularity Functions, Unit Functions, Shifter Functions, Gate Function, Network
Functions, Transfer Functions Of Two-Port Network, Poles And Zeros, Necessary
Conditions For Driving Point Function, Necessary Conditions For Transfer Functions
Time Domain Response From Pole Zero Plot, Amplitude and Phase Response from
Pole Zero Plot, Stability criterion for Active Network, Routh Criteria