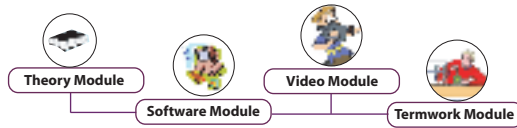


Elements of Electrical Engineering

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

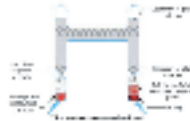
Symbols and Abbreviations



Based upon BS 3763 (1970) and the International System of Units, 1970.
Definitions of Electric and Magnetic S.I. units
Definitions of other derived S.I. units

Fungamental Concepts of Electricity

What is Electricity?,Electrically Charged Particles,Conductors and Insulators,Brief Review of Fundamental Units,Electrical Reference Standards



Electrostatic Fields



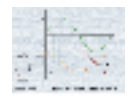
Coulomb's Law,Force on a Concentrated Charge when placed in a Group of Point Charges,Electric Field Intensity due to a Point Charge at Rest,Electric Field or Electric Flux Lines (ϵ),Electric Flux Density (D), Electrostatic Potential and Work Done, Electrostatic Potential, Electrostatic Potential Due to a Point Charge q,Potential Difference Between Points A and ,Electric Potential Gradient.

Electric Circuits with a dc Charge

Electrical Resistance, Effect of Temperature on Resistance,Electric Current and its Effects,Chemical Effect, Direction of Current in an Electric Circuit, Simple Electric Circuits,Ohm's Law, Electric Power and Energy Power, Energy,dc Circuits Containing Resistance,Series Circuits,Kirchhoff's Law as Applied to Series Circuits, Parallel Circuits, Series-Parallel Circuits or Compound Circuits,Distribution Circuits.



Resistance, Inductance & Capacitance in a Single Phase AC Circuit



Circuit having a Resistance only,Power in a Resistive Circuit,Circuit having an Inductance only,Inductive Reactance,Power in an Inductive Circuit,Circuit having a Capacitance only,Capacitive Reactance,Power in a Purely Capacitive Circuit.

Electrostatics



Learning Objectives,Static Electricity,Absolute and Relative Permittivity of a Medium, Laws of Electrostatics,Electric Field,Electrostatic Induction, Electric Flux and Faraday Tubes,Field Strength or Field Intensity or Electric Intensity (E),Electric Flux Density or Electric Displacement,Gauss Law,The Equations of Poisson and Laplace,Electric Potential and Energy,Potential and Potential Difference,Potential at a Point, Potential of a Charged Conducting Sphere,Equipotential Surfaces,Potential and Electric Intensity Inside a Consulting Sphere,Potential Gradient,Breakdown Voltage and Dielectric Strength,Safety Factor of a Dielectric,Boundary Conditions

Capacitance

Capacitor,Capacitance,Capacitance of an Isolated Sphere,Spherical Capacitor,Parallel-plate Capacitor,Special Cases of Parallel-plate Capacitor,Multiple and Variable Capacitors,Cylindrical Capacitor,Capacitance between two Parallel Wires,Cylindrical Capacitor with Compound Dielectric,Insulation Resistance of a Cable Capacitor, Energy stored in a Capacitor,Force of Attraction between Oppositely-charged Plates, Current-Voltage Relationships in a Capacitor,Charging of a Capacitor,Time constant,



Magnetic Circuits



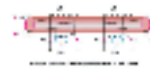
General,Magnetic Field,Magnetic Lines of Force,Magnetic Circuit,Definitions Concerning Magnetic Circuit,Reluctance of a Composite Magnetic Circuit,How to Find Ampere-turns?,Comparison between Electric and Magnetic Circuits,Parallel Magnetic Circuits,Series Magnetic Circuit ,Series-Parallel Magnetic Circuits,Magnetic Leakage and Fringing,Magnetic Leakage,Fringing,Magnetisation Curves, Magnetisation Curves by Ballistic Galvanometer, Kirchoff's Second Law.

Electromagnetism

Absolute and Relative Permeabilities of a Medium,Laws of Magnetic Force,Magnetic Field Strength (H),Magnetic potential,Flux per unit pole,Flux Density (B),Absolute Permeability (μ) and Relative Permeability,Intensity of magnetization (I), Susceptibility (K) Relation between B, H, I and K,Boundary Conditions,Weber and Ewing's Molecular Theory Curie Point,Electromagnetism ,Ampere's Work Law or Ampere's Circuital Law, Biot-Savart Law Applications of Biot-Savart Law, Force Between Two Parallel Conductors.



Inductance



Introduction,Self-Inductance of a Coil,Mutual Inductance, Coefficient of Coupling Between Coils, Inductance of Two Coils Connected in Series,Inductance of Coils Connected in Parallel, Inductances in Series,Inductance in Parallel, Energy Stored in an Inductor,Transient Response of an Inductance,Current Growth in an Inductive Circuit, Current Decay in an Inductive Circuit.