

SEMESTER - II

ELECTRICITY - CORE SUBJECT 2

Unit I

Coulomb's law - Gauss law - its proof - Applications of Gauss's law - Electric field due to charged sphere (a) at any point outside (b) at a point inside (c) at a point on the surface of the sphere. Electric field due to plane sheet of charged conductor - Coulomb's theorem - Mechanical force on the surface of charged conductor - Electric field - flux of electric field - relation between electric field and potential - Potential due to charged spherical conductor at a point (a) outside (b) on the surface and (c) inside.

Unit II

Capacitance - Principle of capacitor - expressions for the capacitance - Spherical capacitor - Cylindrical capacitor - Parallel plate capacitor with and without partly filled dielectric - Energy of capacitor - Loss of energy when two charged conductors share the charges - types of capacitors, fixed capacitor, variable capacitor, electric capacitors and sliding capacitor.

Unit III

Kirchoff's laws - Application of Kirchoff's laws to wheatstone's network - sensitiveness of bridge - Carey Foster's Bridge - Determination of the resistance of the given wire with the necessary theory - Principle of Potentiometer - Determination of internal resistance of the cell using potentiometer - Calibration of ammeter and voltmeter - low and high range.

Unit IV

Biot Savart's law - its application - long straight wire of infinite length - Ampere's theorem - Magnetic field at the center of a circular coil carrying current - magnetic field along the axis of a coil carrying current - magnetic field along the axis of a coil carrying current - solenoid- Ballistic galvanometer - theory - Damping correction - Comparison between deadbeat and a periodic galvanometer - determination of the absolute capacity of condenser , using B.G (theory) and experiment - Comparison of capacitance using B.G (theory) and experiment.

Unit V

Seebeck effect - thermo e.m.f - Natural temperature - temperature of inversion - law of intermediate metal - law of intermediate temperature - Measurement of e.m.f of a thermocouple with a potentiometer Peltier coefficient - Thomson effect - Thomson coefficient - thermoelectric power.

Book for study:

Electricity and Magnetism by sehgal, Chopra & Sehgal Sultan, Chand & Sons ., 1998

Reference Books

Electricity - R. Murugesan, S.Chand & Co. 2004.

Electricity and Magnetism - Dr. K.K. Tewari, S.Chand & Co. 2002

Electricity and Magnetism with electronics - D. N. Vasudeva, S.Chand & Co. 2002

Electricity and Magnetism 20th revised edition - Brijilal & Subramaniam, S.Chand & Co. 2007

Electricity and Magnetism 2nd revised edition - Narayanamoorthy & Nagarathinam - National Publishing Co. 1997.

THERMAL PHYSICS

SKILL BASED

Unit I

Postulates of kinetic theory - Mean free path - Transport Phenomena Conduction, Viscosity and diffusion.

Unit II

Joule - Thomson effect - Porous Plug experiment - Liquification and Oxygen, Hydrogen and Helium - Properties of Helium 1 and Helium 2.

Unit III

Black body radiation - Prevost's theory - Emissive and absorptive power - Distribution of energy in black body - Wein's Displacement law.

Unit IV

Stefan's law of radiation - Derivation of Newton's law from Stefan's law - Solar constant - Temperature of Sun - Angstrom's pyrheliometer - solar spectrum.

Unit V

Thermodynamics - Zeroth law - I, II and III law of thermodynamics - Entropy - Change of entropy in reversible and irreversible process - Heat death - Change of entropy in converting ice into steam.

Book for study:

Heat, Thermodynamics and statistical Physics – Brijlal Subramaniyan and P.S Hemne

S.Chand & Co. 2004'

Heat and Thermodynamics – R.Murugesan, S.Chand & Co. 2004

Reference Book:

Heat and Thermodynamics - D.S. Mathur . S.Chand & Co 2002.