

PHYSICS

Unit I: Electrostatics

- Electric Charges and Their Conservation; Coulomb's Law – Force Between Two Point Charges, Forces Between Multiple Charges; Superposition Principle and Continuous Charge Distribution
- Electric Field, Electric Field Due to a Point Charge, Electric Field Lines; Electric Dipole, Electric Field Due to a Dipole; Torque on a Dipole in a Uniform Electric Field
- Electric Flux, Statement of Gauss's Theorem and Its Applications to Find Field Due to Infinitely Long Straight Wire, Uniformly Charged Infinite Plane Sheet, and Uniformly Charged Thin Spherical Shell (Field Inside and Outside)
- Electric Potential, Potential Difference, Electric Potential Due to a Point Charge, a Dipole and System of Charges; Equipotential Surfaces, the Electrical Potential Energy of a System of Two Point Charges, and Electric Dipoles in an Electrostatic Field
- Conductors and Insulators, Free Charges, and Bound Charges Inside a Conductor; Dielectrics and Electric Polarization, Capacitors and Capacitance, the Combination of Capacitors in Series and in Parallel, the Capacitance of a Parallel Plate Capacitor With and Without Dielectric Medium Between the Plates, Energy Stored in a Capacitor, Van de Graff Generator

Unit II: Current Electricity

- Electric Current, the Flow of Electric Charges in a Metallic Conductor, Drift Velocity and Mobility, and Their Relation With Electric Current; Ohm's Law, Electrical Resistance, V-I Characteristics (Linear and Non-linear), Electrical Energy and Power, Electrical Resistivity and Conductivity
- Carbon Resistors, Colour Code for Carbon Resistors; Series and Parallel Combinations of Resistors; Temperature Dependence of Resistance
- the Internal Resistance of a Cell, Potential Difference, and Emf of a Cell, Combination of Cells in Series and in Parallel
- Kirchhoff's Laws and Simple Applications. Wheatstone Bridge, Metre Bridge
- Potentiometer – Principle, and Applications to Measure Potential Difference, and for Comparing Emf of Two Cells; Measurement of Internal Resistance of a Cell

Unit III: Magnetic Effects of Current and Magnetism

- Concept of the Magnetic Field, Oersted's Experiment. Biot - Savart Law and Its Application to Current Carrying Circular Loop.
- Ampere's Law and Its Applications to Infinitely Long Straight Wire, Straight and Toroidal Solenoids. Force on a Moving Charge in Uniform Magnetic and Electric Fields. Cyclotron.
- Force on a Current-Carrying Conductor in a Uniform Magnetic Field. The Force Between Two Parallel Current-

- Carrying Conductors – Definition of Ampere. Torque Experienced by a Current Loop in a Magnetic Field; Moving Coil Galvanometer – Its Current Sensitivity and Conversion to Ammeter and Voltmeter.
- Force on a Current-Carrying Conductor in a Uniform Magnetic Field. The Force Between Two Parallel Current-Carrying Conductors – Definition of Ampere. Torque Experienced by a Current Loop in a Magnetic Field; Moving Coil Galvanometer – Its Current Sensitivity and Conversion to Ammeter and Voltmeter.
- Current Loop as a Magnetic Dipole and Its Magnetic Dipole Moment. The Magnetic Dipole Moment of a Revolving Electron. Magnetic Field Intensity Due to a Magnetic Dipole (Bar Magnet) Along Its Axis and Perpendicular to Its Axis. Torque on a Magnetic Dipole (Bar Magnet) in a Uniform Magnetic Field; Bar Magnet as an Equivalent Solenoid, Magnetic Field Lines; Earth's Magnetic Field and Magnetic Elements.
- Para-, Dia- And Ferromagnetic Substances, With Examples. Electromagnets and Factors Affecting Their Strengths. Permanent Magnets.

Unit IV: Electromagnetic Induction and Alternating Currents

- Electromagnetic Induction; Faraday's Law, Induced Emf and Current; Lenz's Law, Eddy Currents. Self and Mutual Inductance
- Alternating Currents, Peak and Rms Value of Alternating Current/Voltage; Reactance and Impedance; LC Oscillations (Qualitative Treatment Only), Lcr Series Circuit, Resonance; Power in AC Circuits, Wattless Current. AC Generator and Transformer

Unit V: Electromagnetic Waves

- Need for Displacement Current. Electromagnetic Waves and Their Characteristics (Qualitative Ideas Only). Transverse Nature of Electromagnetic Waves.
- Electromagnetic Spectrum (Radio Waves, Microwaves, Infrared, Visible, Ultraviolet, X-Rays, Gamma Rays) Including Elementary Facts About Their Uses.

Unit VI: Optics

- Reflection of Light, Spherical Mirrors, Mirror Formula. Refraction of Light, Total Internal Reflection, and Its Applications, Optical Fibres, Refraction at Spherical Surfaces, Lenses, Thin Lens Formula, Lens Maker's Formula. Magnification, Power of a Lens, Combination of Thin Lenses in Contact Combination of a Lens and a Mirror. Refraction and Dispersion of Light Through a Prism
- Scattering of Light–Blue Colour of the Sky and Reddish Appearance of the Sun at Sunrise and Sunset
- Optical Instruments: Human Eye, Image Formation, and Accommodation, Correction of Eye Defects (Myopia and Hypermetropia) Using Lenses
- Microscopes and Astronomical Telescopes (Reflecting and Refracting) and Their Magnifying Powers

- The distinction between Marketing and Selling
- Marketing Mix – Concept and Elements:
 - Product – Nature, Classification, Branding, Labelling, and Packaging
 - Physical Distribution: Meaning, Role; Channels of Distribution, Meaning, Types, Factors, Determining the Choice of Channels
 - Promotion – Meaning and Role, Promotion Mix, Role of Advertising and Personal Selling; Objections to Advertising
 - Price: Factors Influencing Pricing

Unit XII: Consumer Protection

- ✓ Importance of Consumer Protection
- ✓ Consumer Rights
- ✓ Consumer Responsibilities
- ✓ Ways and Means of Consumer Protection – Consumer Awareness and Legal Redressal with Special Reference to the Consumer Protection Act
- ✓ Role of Consumer Organisations and NGOs

Unit XIII: Entrepreneurship Development

- ✓ Concept, Functions, and Need
- ✓ Entrepreneurship Characteristics and Competencies
- ✓ Process of Entrepreneurship Development
- ✓ Entrepreneurial Values, Attitudes, and Motivation – Meaning and Concept