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as quantum
physics



PHYSICS IMPORTANT TOPICS

Boards 2021

As per the reduced syllabus

Physics Important Topics Class 12

Chapter 1: Electric Charges and Fields

- Coulomb's law-force between two-point charges(scalar and vector form)
- Forces between multiple charges, superposition principle.
- Electric field-due to a point charge, due to a dipole.
- Electric dipole(torque on a dipole in uniform electric field).
- Electric flux.
- Gauss theorem(using it to find field due to infinitely long straight wire, uniformly charged infinite plane sheet).

Chapter 2: Electrostatic Potential and Capacitance

- Electric Potential due to a point charge.
- Electric Potential on Axial Line & Equatorial Line of an Electric Dipole.
- Capacitance of parallel plate capacitor (with or without dielectric medium).
- Energy stored in a capacitor.

Chapter – 3: Current Electricity

- Expression for drift velocity.
- Relation between current and drift velocity.
- Temperature dependence of resistance.
- Electrical energy and power.
- Internal resistance of a cell, combination of cells in series and in parallel.
- Kirchhoff's laws and simple applications, Wheatstone bridge, metre bridge(basic idea only).

- Potentiometer - principle and its applications.

Chapter–4: Moving Charges and Magnetism

- Application of Biot - Savart law (Calculation of magnetic field due to current carrying circular loop)
- Ampere's law and its applications (Magnetic field due to infinitely long straight wire; Straight and toroidal solenoids).
- Force on a moving charge in uniform magnetic and electric fields.
- Force on a current-carrying conductor in a uniform magnetic field.
- Force between two parallel current-carrying conductors.
- Torque experienced by a current loop in uniform magnetic field.
- Moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter.

Chapter – 5: Magnetism and Matter

- Current loop as a magnetic dipole and its magnetic dipole moment.
- Earth's magnetism.
- Torque on a magnetic dipole (bar magnet) in a uniform magnetic field.

Chapter – 6: Electromagnetic Induction

- Faraday's laws, induced EMF and current.
- Lenz's Law, Eddy currents.
- Self and mutual induction.

Chapter–7: Alternating Current

- Relation between rms and peak value of current & emf.
- Reactance and impedance.
- LC oscillations(basic idea).
- LCR series circuit, resonance, power in AC circuit.
- AC generator and transformer.

Chapter–8: Electromagnetic Waves

- Characteristic and Properties of EM Waves.
- Electromagnetic spectrum(radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including their uses.

Chapter–9: Ray Optics and Optical Instruments

- Total Internal Reflection (including its application- optical fiber).
- Lensmaker's formula.
- Magnification, power of a lens, combination of thin lenses in contact.
- Refractive Index of a Prism and Condition for Minimum Deviation.
- Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.

Chapter-10: Wave Optics

- Wave front and Huygen's principle.
- Proof of laws of reflection and refraction using Huygen's principle.
- Young double slit experiment(expression for fringe width, coherent sources and sustained interference of light).
- Diffraction using single slit(width of central maximum).

Chapter–11: Dual Nature of Radiation and Matter

- Dual nature of radiation.
- Photoelectric effect.
- Hertz and Lenard's observations.
- Einstein's photoelectric equation-particle nature of light.
- Matter waves-wave nature of particles, de-Broglie relation.

Chapter-12: Atoms

- Alpha-particle scattering experiment.
- Expression of radius (hydrogen like atoms).
- Bohr model, energy levels, hydrogen spectrum (Including numerical problems).

Chapter-13: Nuclei

- Mass-energy relation.
- Mass defect.
- Nuclear fission.
- Nuclear fusion.

Chapter -14: Semiconductor Electronics: Materials, Devices and Simple Circuits

- Energy bands in Conductors; Semiconductors and Insulators.
- Semiconductor diode: I-V characteristics in forward and reverse bias.
- Diode as a rectifier.
- Special purpose p-n junction diodes: LED, photodiode, solar cell.