भौतिकी

Chapter name	Whether the chapter is selected or not	Selected topics	Deleted topics
Electric charge and field	Yes	Electric charges and their properties. Coulomb's law – force between two point charges, continuous charge distribution. Electric field, electric field due to a point charge, electric field lines, electric dipole, electric dipole moment electric field due to a dipole (on axial and equatorial lines only), torque on a dipole in a uniform electric field. Electric flux, statement of Gauss's theorem statement ,proof and its applications to find field due to infinitely long straight wire and uniformly charged thin spherical shell (field inside and outside).	forces between multiple charges; superposition principle electric Field due to charged infinite plane sheet
Electric potential and capacitance	Yes	Electric potential, potential difference, electric potential due to a point charge,capacitors and capacitance, energy stored in a capacitor.	electric potential due to a dipole and system of charges; capacitance of a parallel plate capacitor with and without dielectric medium between the plates, Van de Graaff generator.equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipoles in an electrostatic field.combination of capacitors in series and in parallel, Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation,
Current Electricity	Yes	Electric current, flow of electric charges in a metallic conductor, drift velocity and mobility, and relation between drift velocity and electric current; Ohm's law, series and parallel combinations of resistors; Internal resistance of a cell,	electrical energy and power, electrical resistivity and conductivity. Carbon resistors, colour code for carbon resistors; temperature dependence of resistance.electrical resistance, V-I characteristics (linear and

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		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.	non-linear),Potentiometer – principle and applications to measure potential difference, and for comparing emf of two cells; measurement of internal resistance of a cell.
Magnetic effect of current	Yes	Biot - Savart law and its application to current carrying circular loop. Ampere's law its proof and 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. Torque experienced by a current loop in a magnetic field; moving coil galvanometer ; Earth's magnetic field and magnetic elements.	Concept of magnetic field, Oersted's experiment. bar magnet as an equivalent solenoid, magnetic field lines; Force between two parallel current-carrying conductors – definition of ampere.– current sensitivity and conversion to ammeter & voltmeter of Moving coil Galvanometer Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron.
Magnetism and matter	Yes	Electromagnetic induction(definition) ; Faraday's law, induced emf and current; Lenz's Law, Self and mutual inductance. AC generator and transformer.	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 fieldPara-, dia- and ferro - magnetic substances, with examples.Electromagnets and factors affecting their strengths. Permanent magnets.
Electromagnetic induction	Yes	Electromagnetic induction(definition) ; Faraday's law, induced emf and current; Lenz's Law, Self and mutual inductance.	Eddy currents
Alternating current	Yes	AC generator and transformer.	Alternating currents, peak and rms value of alternating current /voltage; reactance and impedance; LC oscillations (qualitative treatment only), LCR series

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			circuit, resonance; power in AC circuits, wattless current
Electromagnetic waves	Yes	Electromagnetic waves and their characteristics (qualitative ideas only).Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, x-rays, gamma rays) including elementary facts about their uses.	Transverse nature of electromagnetic waves. Need for displacement current.Modified ampere's circuital law
Ray optics	Yes	Refraction of light, refraction at spherical surface (μ2/v)-(μ1/u)=(μ2-μ1)/R lensmaker's formula $\frac{1}{f} = (\mu - 1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$ Combination of thin lenses in contact. Refraction of light through a prism. Derive prism formula $\mu = \frac{\sin\left(\frac{A+\delta m}{2}\right)}{\sin\left(\frac{A}{2}\right)}$ Microscopes and their magnifying powers.	Reflection of light, spherical mirrors, mirror formula lenses, thin lensformula, Magnification, power of a lens, 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, hypermetropia, presbyopia and astigmatism) using lenses. total internal reflection and its applications, optical fibres, astronomical telescopes (reflecting and refracting) and their magnifying powers.
Wave Optics	Yes	Wavefront and Huygens' principle Proof of laws of refraction using Huygens' principle. Interference, Young's double slit experiment and expression for fringe width, Polarization, plane polarized light; Brewster's law, uses of plane polarized light and Polaroids.	Reflection and refraction of plane wave at a plane surface using wavefronts. Proof of laws of reflection using Huygens' principle. coherent sources and sustained interference of light. Diffraction due to a single slit, width of central maximum. Resolving power of microscopes and astronomical telescopes.
Dual Nature of Matter and Radiation	Yes	Photoelectric effect, Einstein's photoelectric equation Matter waves – wave nature of particles, de	Hertz and Lenard's observations; Davisson-Germer experiment. Particle nature of light(photon

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Atoms	No		Alpha - particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum.
Nuclei	Yes	Radioactivity –Radioactive decay law $N = N_0 e^{-\lambda t}$ Mass-energy relation, mass defect; binding energy per nucleon	Composition and size of nucleus, atomic masses, isotopes, isobars; isotones.alpha, beta and gamma particles/rays and their properties; nuclear
Semiconductor Electronics: Material devices and simple circuits	Yes	Semiconductors; semiconductor diode – I-V characteristics in forward and reverse bias, diode as a rectifier; Logic gates (OR, AND, NOT, NAND and NOR).	I-V characteristics of LED, photodiode, solar cell, and Zener diode; Zener diode as a voltage regulator. Junction transistor, transistor action, characteristics of a transistor; transistor as an amplifier (common emitterconfiguration) and oscillator, Transistor as a switch.
Communications system	Yes	Elements of a communication system (block diagram only);	bandwidth of transmission medium. Propagation of electromagnetic waves inthe atmosphere, sky and space wave propagation. Need for modulation. Production and detection of an amplitude-modulated wave.