S.D.PUBLIC SCHOOL,PITAMPURA,NEW DELHI
ACADEMIC PLANNER , XII- Physics(2026-2027)

DAY/DATE	chapter/contents	Learning outco	No. of Assignments/H.W	INTERDISCIPLINARY ASPECT/SDG	Activities/practicals
April 1--15 (11 days)	**(Chapter 1)Electric charges and fields** IntroductionChapter–1: Electric Charges and Fields Electric charges, Conservation of charge, 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 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	The learner recognises the concepts of Physics related to various natural phenomena; such as, electrostatic force; electric and fields and flux;	C.W.:NCERT numericals(examples and conceptual questions) Hw: Assignment of electrostatics	Understanding these interconnections helps in grasping advanced concepts in electromagnetism, electronics, and quantum physics.	*Paper and comb activity. *To assemble components of given electric circuit

April 16-30 (13 days)	**Chapter–2: Electrostatic Potential and Capacitance** Electric potential, potential difference, e quipotential surfaces, electrical potential energy of a system of two-point charges and of electric dipole in an electrostatic field. , free charges and bound charges inside a conductor. Dielectrics and electric polarization, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor **(**no derivation, formulae only**)**.	The learner recognises the concepts of electrostatic potential; differentiates between certain physical quantities; such as, between electric field and electric potential; potential difference and emf of a cell;	Cw:N.C.E.R.T. examples & questions will be done		*To assemble a household circuit comprising three bulbs, three (on/off) switches, a fuse and a power source.
	Chapter–3: Current Electricity Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, V-I characteristics (linear and non-linear), electrical energy and power, electrical resistivity and conductivity, temperature dependence of resistance, Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel, Kirchhoff's rules, Wheatstone bridge.	The learner recognises the concepts of drift of electrons; electric current; resistance of materials; differentiates between certain physical quantities	Hw:N.C.E.R.T question Assignment will be given at the end of chapter		*. To find resistance of a given wire / standard resistor using metre bridge. 3. To verify the laws of combination (series)of resistance.

May (1-15) (06 days)	**Chapter–4: Moving Charges and Magnetism** Concept of 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 solenoid (only qualitative treatment), 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-definition of ampere, torque experienced by a current loop in uniform magnetic field; Current loop as a magnetic dipole and its magnetic dipole moment, moving coil galvanometer- its current sensitivity and conversion to ammeter and voltmeter.	recognises different processes used in Physics-related industrial and technological applications; such as, using electrostatic shielding in protecting sensitive instruments from outside electrical influences;	Cw:NCERT questions will be done Assignment will be given at the end of chapter	**Moving Charge & Magnetism in Chemistry-** Spectroscopy: Magnetic fields influence electron spin and molecular energy levels in techniques like Nuclear Magnetic Resonance (NMR) spectroscopy.	*To determine resistance of a galvanometer by half defection method and find its figure of merit *To demonstate various part of moving coil galvanometer.

July (1-15) (12 days)	**Chapter–5: Magnetism and Matter** Bar magnet, bar magnet as an equivalent solenoid (qualitative treatment only), magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis (qualitative treatment only), torque on a magnetic dipole (bar magnet) in a uniform magnetic field (qualitative treatment only), magnetic field lines. Magnetic properties of materials- Para-, dia- and ferro – magnetic substances with examples, Magnetization of materials, effect of temperature on magnetic properties.	The learner recognises the concepts of magnetic properties of materials ,recognises different processes used in Physics-related industrial and technological applications; ; use of superconductin	Cw: Conceptual questions &numericals	Biomagnetism: Some organisms, like migratory birds and bacteria, have magnetite crystals that help in navigatio n.	Showing them behaviour of different substances in magnetic field.
	Chapter–6: Electromagnetic Induction-Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Self and mutual induction.	recognises the concepts electromagnetic induction	Hw:Assignment of c	Induction & AC in Environmental Science-Renewable Energy Sources: Wind and	To study the factor on which the self-inductance of a coil depends by observing the effect of this coil, when put in series with a resistor/(bulb) in a circuit fed up by an
July (16-31) (14 days)	**Chapter–7: Alternating Current** Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LCR series circuit (phasors only), resonance, power in AC circuits, power factor, wattless current. AC generator, Transformer.		Cw:NCERT & extra questions will be done	Science & EngineeringWire less Power Transfer: Used in inductive charging for smartphones and medical implants	To find frequency of a.c. Mains using sonometer.

August (1--15) (11 days)	**Chapter–8: Electromagnetic Waves** Basic idea of displacement current, Electromagnetic waves, their characteristics, their transverse nature (qualitative idea only).Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.	recognises different processes used in Physics-related industrial and technological applications; such as, using electrostatic shielding in	Assignment of e.m wave(conceptual based & numericals based)	Medical Imaging: X-rays, CT scans, and MRI use EM waves to diagnose diseases.	To find angle of minimum deviation by plotting graph.
	Chapter–9: Ray Optics and Optical Instruments **Ray Optics**: Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and optical fibers, refraction at spherical surfaces, lenses, thin lens formula, lens maker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction of light through a prism. **Optical instruments**: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.	The learner recognises the concepts of reflection, refraction, .recognises different processes used in Physics-related industrial and technological applications; such as, applications of	Assignment of ray optics(Conceptual based & Numericals based)Cw:NCERT questions will be done	Ray optics plays a critical role in multiple scientific and technological fields, enabling advancements in medicine, environmental monitoring, telecommunications,	*To find focal length of convex lens *To show variation in size of image through concave mirror or convex lens (using candle and screen)

August (16--31) (11 days)	**Chapter–10: Wave Optics** Wave front and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygen's principle. Interference, Young's double slit experiment and expression for fringe width (No derivation final expression only), coherent sources and sustained interference of light, diffraction due to a single slit, width of central maxima (qualitative treatment only).	Recognises the concepts of intererence, diffraction of light . differentiates between certain physical quantities; such as, between interference and diffraction;	Hw:Assignment of wave optics	Wave optics is essential in various scientific disciplines, from healthcare and environmental monitoring to communication and space exploration.	To find the refractive index of a liquid using a concave mirror and a plane mirror.
Sept. (1--15) (11days)	**Revision**		half yearly exams- Chapter 1 to 8		
Sept. (16--30) (13days)					
Oct. (1--15) (11days)	**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.Experimental study of photoelectric effect Matter waves-wave nature of particles, de-Broglie relation.	Differentiates between certain physical quantities; such as, between wave and particle nature of light;	Hw:assignment of chapter	Crucial concept influencing physics, chemistry, medicine, environmental science,	

	Chapter–12: Atoms Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of hydrogen atom, Expression for radius of nth possible orbit, velocity and energy of electron in nth orbit, hydrogen line spectra (qualitative treatment only).	Various materials give rise to interesting properties in the presence or absence of electric field,	Hw:assignment of chapter	Connects atomic and nuclear physics with cell biology has led to significant advancements in medicine.	To find lateral displacement using glass slab.
Oct. (16--31) (09days)	**Chapter–13: Nuclei** Composition and size of nucleus, nuclear force, Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission, nuclear fusion.	Used in Physics-related industrial and technological applications; such as, use of controlled chain	Hw:Assignment of chapter	It led to significant advancements in medicine, biotechnology, and genetics.	To identify capacitor,diode,resistor, LED from the given mixture.
Nov. (1--15) (09days)	**Chapter–14: Semiconductor Electronics:** Materials, Devices and Simple CircuitsEnergy bands in conductors, semiconductors and insulators (qualitative ideas only) Intrinsic and extrinsic semiconductors-p and n type, p-n junction.Semiconductor diode - I-V characteristics in forward and reverse bias, application of junction diode - diode as a rectifier.	Making light sensitive cells using the applications of photoelectric effect; use of atomic and nuclear physics in medicine	Topics will be taught through class projects, experiments, examples, etc. Activities will be conducted through multisensory modes before explaining any theory and concept.	It has led to advancements in quantum technology, medical imaging, and nanoscience, driving innovation across multiple fields	To show characteristics of p-n diode(forward and reverse bias).
Nov. (16--30) (12days)	**REVISION AND PRE-BOARD EXAMINATION.**		**Unit test I**	**Chapter 1-3**	
Dec.	**Revision of syllabus**		**Half Yearly Exam.**	**Chapter 1-8**	
(1-15)			**PREBOARD EXAM**	**COMPLETE SYLLABUS**	
12 days					