साप्ताहिक विच्छेदित पाठ्यक्रम 2023-24						
CLASS - 12 SUBJECT -PHYSICS						
MONTH	WEEKS	NAME OF CHAPTER	TOPICS	Period	LEARNING OUTCOME	Practical syllabus (Total No. of Required Priods = 60) WEIGHTAGE/ TOTAL MARKS 30 (TO BE COMPLETED IN BETWEEN JUNE 23 TO JAN 24)NO. OF PACTICALS WILL BE COMPLETED AS PER JAC SYLLABUS
June 2023	1st, 2nd & 3rd	1. Electric charge and field	Electric charges and their conservation. Coulomb's law – force between two point charges,forces between multiple charges; superposition principle and continuous charge distribution. forces between multiple charges; superposition principle and continuous charge distribution..Electric field, electric field due to a point charge, electric field lines; electric dipole, electricfield 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). PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS.	17	1. Knowledge: (Student can Name, Write, Speak about) Charge and its properties, distribution and charge distribution, Coulomb's law , Electric dipole , Electric dipole moment ,Electric flux , Gauss law 2 . Comperehension: (Student can Understand, Explain, Discuss, Discribe) methods of charging , Quantisation of charge , Electric field lines, Electric field intensity electric flux 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) Superposition principle, Gauss theorem 4. Analysis: (Students can Correlate, Compare, Plot graph) electric force and charge separation (F~r) in different situations, Electric field and point separation(E ~ r) for different systems, Electric flux of different 5. Synthesis: (Student can Visualize, Recognize)electric force,electric field, electric flux in different situation & for different systems 6. Evaluation: (Student can Prove, Apreciate, Conclude) Gauss theorem	1 Determine resistance per cm of a given wire by plotting a graph of potential difference verses current. 2 Determine resistance and specific resistance of a given wire using Meter Bridge. 3 Verify laws of series and parallel combinations of resistances using Meter Bridge. 4 Determine

Month	Week	Chapter	Topics	Periods	Learning Objectives	Activities/Experiments
June 2023	4th (5 days)	2. Electric potential and capacitance	Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipoles in an electrostatic field. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, capacitors and capacitance, combination of capacitors in series and in parallel PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS	12	1. Knowledge: (Student can Name, Write, Speak About)Electric potential, potential difference, equipotential surface Dielectrics capacitor & capacitance 2 . Comperehension: (Student can Explain, Discuss, Discribe) equipotential surfaces, electrical polarisation 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) electric potential due to a point charge, a dipole and system of charges electrical potential energy of a system of two point charges and electric dipole, combination of capacitors in series and in parallel, energy stored in a capacitor 4. Analysis: (Students can Correlate, Compare, Plot graph) Electric potential and point separation (V~r) capacitance with area/distance/medium (C~A/d/ε) 5. Synthesis: (Student can Visualize, Recognize) electric potyential due to different systems of charges, capacitor 6. Evaluation: (Student can Prove, Apreciate, Conclude) Effect of dielectric/ conductor on capacitance	resistance of a galvanometer by half deflection method and find its figure of merit. 5 Convert the given galvanometer into an ammeter and voltmeter of desired range and to verify the same. 6 Find the different values of image distance (v) for different values of object distance (u) in case of a concave mirror and find its focal length by plotting graph (a) between v and u and (b) between 1/v and 1/u. 7 Find the different values of image distance (v) for different values of object distance (u) in case of a convex lens and find its focal length by
June 2023	5th (3 days)	2. Electric potential and capacitance	capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor, PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS			
July	1st (1 day)	03.CURRENT ELECTRICITY	Electric current, flow of electric charges in a metallic conductor			

July	2nd (6 days)	03.CURRENT ELECTRICITY	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. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS temperature dependence of resistance.	22	1. Knowledge: (Student can Name, Write, Speak ,Define About)Electric current,drift velocity and mobility,Ohm's law, electrical resistance,Carbon resistors,Internal resistance of a cell, potential difference and emf of a cell,Kirchhoff 's laws 2 . Comperehension: (Student can Explain, Discuss, Discribe)flow of electric charges in a metallic conductor,electrical energy and power,electrical resistivity and conductivity 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) ,combination of cells in series and in parallel, Kirchhoff 's laws , , 4. Analysis: (Students can Correlate, Compare, Plot graph)V-I characteristics (linear and non-linear),relation of Drift velocity with electric current, Relation between EMF and PD PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS Kirchhoff 's laws and simple applications. Wheatstone bridge .	focal length by plotting graph (a) between v and u and (b) between 1/v and 1/u. 8 Find focal length of a convex mirror using a convex lens with the help of optical bench. 9 Find focal length of a concave lens using a convex lens with the help of optical bench. 10 Determine the angle of minimum deviation for a given prism by plotting a graph between angle of incident (i) and angle of deviation (d). Also find the refractive index of prism material.
July	3rd (5 days)	03.CURRENT ELECTRICITY	Internal resistance of a cell, potential difference and emf of a cell, combination of cells inseries and in parallel. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS Kirchhoff 's laws and simple applications. Wheatstone bridge .		1. Knowledge: (Student can Name, Write, Speak, Define) Oersted's experiment, Biot - Savart law, Ampere's law,definition of ampere	
July	4th (6 days)	4. Magnetic effect of current	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 solenoids. Force on a moving charge in uniform magnetic and electric fields.		2 . Comperehension: (Student can Explain, Discuss, Discribe)Concept of magnetic field,current sensitivity of moving coil Galvanometer 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) Biot - Savert law in current carrying circular loop, Ampere's Law to infinitely long straight wire, straight and solenoids ,Torque experienced by a current loop in a magnetic field ,	11. Draw I-V characteristic curve of a p-n junction in forward bias and determine reverse bias.

Month	Week	Chapter	Topics		Learning Objectives
July	5th (5 days)	4. Magnetic effect of current	Force on a current-carrying conductor in a uniform magnetic field. Force between two parallel current-carrying conductors – definition of ampere.		4. Analysis: (Students can Correlate, Compare, Plot graph) Variation of magnetic field with distance for straight wire, solenoid , current and voltage sensitivity of moving coil galvanometer 5. Synthesis: (Student can Visualize, Recognize)Force on a moving charge in uniform magnetic and electric fields 6. Evaluation: (Student can Prove, Apreciate, Conclude) conversion of moving coil Galvanometer to ammeter and voltmeter.
August	1st (5 days)	4. Magnetic effect of current	Torque experienced by a current loop in a magnetic field;moving coil galvanometer – its current sensitivity and conversion to ammeter and voltmeter. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS		
August	2nd (5 days)	4. Magnetic effect of current	PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS		
August	3rd (4 days)	5. Magnetism and matter	Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment 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; and magnetic elements. Para-, dia- and ferro - magnetic substances, with examples. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS		1. Knowledge: (Student can Name, Write, Speak ,Define)magnetic dipole,magnetic dipole moment,magnetic field lines , and magnetic elements,Electromagnets,Permanent magnets 2 . Comperehension: (Student can Explain, Discuss, Discribe)Various properties of Ferro, Para Di magnetic substance 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) Magnetic dipole moment of a revolving electron , Torque on a magnetic dipole (bar magnet) in a uniform magnetic field , and magnetic elements, Distinguish Para-, dia- and ferro - magnetic substances , 4. Analysis: (Students can Correlate, Compare, Plot graph) Various properties of Ferro, Para Di magnetic substance, and magnetic elements 5. Synthesis: (Student can Visualize, Recognize) bar magnet as an equivalent solenoid,Current loop as a magnetic dipole, 6. Evaluation: (Student can Prove, Apreciate, Conclude)Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis

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August	4th (5 days)	6. Electromagnetic induction	Electromagnetic induction; Faraday's law, induced emf and current; Lenz's Law,		1. Knowledge: (Student can Name, Write, Speak About)Electromagnetic induction, Faraday's law, Lenz's Law ,Self and mutual inductance. 2 . Comperehension: (Student can Explain, Discuss, Discribe) Faraday Law, Lenz law 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) of Lenz law in find direction of induced current in coil, of , Self inductance of a coil and mutual inductance of two long solenoid , AC generator
August	5th (3 days)	6. Electromagnetic induction	. Self and mutual inductance. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS		4. Analysis: (Students can Correlate, Compare, Plot graph) Motional EMF 5. Synthesis: (Student can Visualize, Recognize) the polarity of induced emf in wire 6. Evaluation: (Student can Prove, Apreciate, Conclude) mutual inductance of two co centric loop
September	1st (2 days)	7. Alternating currents	Alternating currents, peak and rms value of alternating current /voltage; reactance and impedance;		1. Knowledge: (Student can Name, Write, Speak, Define) Alternating currents, peak and rms value of alternating current /voltage; reactance and impedance, , resonance; wattless current 2 . Comperehension: (Student can Explain, Discuss, Discribe) (qualitative treatment only) 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) LCR series circuit, AC generator and transformer. 4. Analysis: (Students can Correlate, Compare, Plot graph) (qualitative treatment only), peak and rms value of alternating current /voltage; reactance and impedance;
September	2nd (5 days)	7. Alternating currents	LCR series circuit, resonance; power in AC circuits, wattless current. AC generator and transformer. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS		1. Knowledge: (Student can Name, Write, Speak About) Electromagnetic waves and their characteristics (qualitative ideas only). 2 . Comperehension: (Student can Explain, Discuss, Discribe) Electromagnetic waves and their characteristics (qualitative ideas only). 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, x-rays, gamma rays) including elementary facts about their uses. 4. Analysis: (Students can Correlate, Compare, Plot graph) electromagnetic waves, electromagnetic spectrum 5. Synthesis: (Student can Visualize, Recognize) electromagnetic waves, electromagnetic spectrum 6. Evaluation: (Student can Prove, Apreciate, Conclude) Transverse nature of electromagnetic waves.

Month	Week	Chapter	Topics		Learning Objectives
September	3rd (5 days)	8 .Electromagnetic waves	Basic idea of 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. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS		1. Knowledge: (Student can Name, Write, Speak Define)Reflection of light, spherical mirrors, mirror formula. Refraction of light, total internal reflection, refraction at spherical surfaces, lenses, thin lens formula, lensmaker's formula. Magnification, power of a lens, Refraction and dispersion of light through a prism. Scatteri, Optical instruments: 2 . Comperehension: (Student can Explain, Discuss, Discribe) Mirror Formula, lens formula Refraction of light, total internal reflection, refraction at spherical surfaces, power of lens 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) Total internal Reflection, concave mirror, convex mirror, mirror formula, lens formula, prism formulas using lenses compound microscope, telescope, 4. Analysis: (Students can Correlate, Compare, Plot graph) refraction at spherical surfaces
September	4th (4 days)	9. Ray optics and Optical instruments	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 Makers Formulae		5. Synthesis: (Student can Visualize, Recognize)Magnification, power of a lens, advantage of reflecting type telescope 6. Evaluation: (Student can Prove, Apreciate, Conclude) lens Makers formula, magnification of simple , compound microscope, telescope, power of lens
September	5th (3 days)	9. Ray optics and Optical instruments	Magnification, power of a lens, combination of thin lenses in contact. Refraction of light through a prism. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS		
October	1st (4 days)	9. Ray optics and Optical instruments	Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS		
October	2nd (6 days)	10. Wave optics	Wavefront and Huygens' principle, reflection and refraction of plane wave at a planesurface using wavefronts. Proof of laws of reflection and refraction using Huygens' principle. Interference,		

October	3rd (4 days)	*10. Wave optics*	Young's double slit experiment and expression for fringe width, coherent sources and sustained interference of light. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS		1. Knowledge: (Student can Name, Write, Speak ,Define)Wavefront and Huygens' principle,Interference,Diffraction, 2 . Comperehension: (Student can Explain, Discuss, Discribe)Wavefront, interference of light, diffraction of light , Resolving power of microscopes and astronomical telescopes. 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) uses of plane polarised light and Polaroids , colour of thin film, position os bright and dark fringe, fringe width 4. Analysis: (Students can Correlate, Compare, Plot graph) variation of intensity with path difference or phase difference ,Resolving power of microscopes and astronomical telescopes. 5. Synthesis: (Student can Visualize, Recognize) Interference of light , diffraction of light 6. Evaluation: (Student can Prove, Apreciate, Conclude) Fringe width , angular width
October	4th (3 days)	10. Wave optics	Diffraction due to a single slit, width of central maximum. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS		
October	5th(2 days)	11. Dual Nature of Matter and Radiation	Dual nature of radiation,Photoelectric effect, Hertz and Lenard's observations		1. Knowledge: (Student can Name, Write, Speak, Define)Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation – particle nature of light. Matter waves – wave nature of particles, de Broglie relation.
November	1st & 2nd (5 days)	11. Dual Nature of Matter and Radiation	Einstein's photoelectric equation – particle nature of light.Matter waves – wave nature of particles, de Broglie relation. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS	30	, 2 . Comperehension: (Student can Explain, Discuss, Discribe)Einstein's photoelectric equation – particle nature of light , 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) photoelectric effect 4. Analysis: (Students can Correlate, Compare, Plot graph) graph between photoelectric current and potential of anode plate with intensity and frequency 5. Synthesis: (Student can Visualize, Recognize)photoelectric effect, Matter wave 6. Evaluation: (Student can Prove, Apreciate, Conclude)Einstein's photoelectric equation – particle nature of light

November	3rd & 4th (6 days)	12. Atoms	.Alpha - particle scattering experiment; Rutherford's model of atom Bohr model of hydrogen atom, expression for radius , velocity & energy of electron in nth orbit, energy levels,hydrogen line spectra.		1. Knowledge: (Student can Name, Write, Speak, Define) Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum. 2 . Comperehension: (Student can Explain, Discuss, Discribe) Alpha - particle scattering experiment; Rutherford's model of atom; Bohr model, . 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) energy levels, hydrogen spectral series. 4. Analysis: (Students can Correlate, Compare, Plot graph) energy levels diagram, different series hydrogen spectrum. 5. Synthesis: (Student can Visualize, Recognize) Rutherford's model of atom; Bohr model 6. Evaluation: (Student can Prove, Apreciate, Conclude)Alpha - particle scattering experiment; Rutherford's model of atom; Bohr model.
November	5th (3 days)	13. Nuclei	Composition and size of nucleus, Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission and fusion. PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS		1. Knowledge: (Student can Name, Write, Speak, Define)Composition and size of nucleus, Mass-energy relation, mass defect; binding energy per nucleon ; nuclear fission and fusion. 2 . Comperehension: (Student can Explain, Discuss, Discribe) Composition and size of nucleus, atomic masses, isotopes, isobars; isotones. Radioactivity – alpha, beta and gamma particles/rays and their properties; ; nuclear fission and fusion. 3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) Composition and size of nucleus; radioactive decay law; nuclear fission and fusion. 4. Analysis: (Students can Correlate, Compare, Plot graph)Composition and size of nucleus, atomic masses, isotopes, isobars; isotones. Radioactivity – alpha, beta and gamma particles/rays and their properties; radioactive decay law. Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission and fusion. 5. Synthesis: (Student can Visualize, Recognize)Composition and size of nucleus, atomic masses, isotopes, isobars; isotones. Radioactivity 6. Evaluation: (Student can Prove, Apreciate, Conclude)Composition and size of nucleus, atomic masses; radioactive decay law; binding energy per nucleon and its variation with mass number; nuclear fission and fusion.

December	1st (2 days)	14. semiconductor	Energy bands in conductors, semiconductors and insulators (qualitativeideas only)		1. Knowledge: (Student can Name, Write, Speak, Define)Semiconductors; semiconductor Diode 2 . Comperehension: (Student can Explain, Discuss, Discribe) Semiconductors; semiconductor diode – I-V characteristics in forward and reverse bias, Junction transistor, transistor action
December	2nd (6 days)	14. semiconductor	intrinsic and extrinsic Semiconductors p and n type,p-n junction ; semiconductor diode – I-V characteristics in forward and reverse bias, diode as a rectifier; PRACTICE SESSION /Q A SESSION/ NUMERICALS OF ABOVE TAUGHT TOPICS		3. Application: (Student can Derive, Solve Numericals, Apply in everyday life) diode as a rectifier; LED, photodiode, solar cell, and Zener diode; Zener diode as a voltage regulator, 4. Analysis: (Students can Correlate, Compare, Plot graph); Different type of semiconductors ,semiconductor diode – I-V characteristics in forward and reverse bias, photodiode, solar cell, and Zener diode; characteristics of a transistor; . 5. Synthesis: (Student can Visualize, Recognize)Semiconductors; semiconductor diode – forward and reverse bias, LED, photodiode, solar cell, and Zener diode; 6. Evaluation: (Student can Prove, Apreciate, Conclude) Dynamic Resistance in forward and reverse bias, Current gain, Voltage Gain and Transconductance of transistor,
December	3rd (5 days)				
December	4th (6 days)				
January, February till board examination			Revision & Test		