

ACADEMIC YEAR PLAN : 2023-24

Name of the Subject :	Name of the Subject : PHYSICS- Part-1		Class: XII A &B		
MONTH / No.of working days	Name Of the Unit / Topics	Learning Outcomes	Suggested Activities/ Projects/ Practicals	Assignments	Assessment
APRIL -JUNE (26)	<p>Electrostatics 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 inside and outside). 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 dipole in an electrostatic field. 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, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor(no derivation , formulae only</p>	<p>The students will be able to explain the following facts and concepts-- *Electric charges; Conservation of charges *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 electric field due to (i) infinitely long st. conductor, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (inside and outside) *Electric potential and potential difference, electric potential gradient *electric potential due to dipole, the potential energy and torque due to an electric dipole. *Dielectrics, polarization and capacitance and its derivations.</p>	<p>Activities-- 1) Find the pairs of materials having/ showing static charge accumulation to prove conservation of charges. 2) Make the cubes to solve the numericals based on Gauss theorem. 3) Make a flow chart on electric potential. 4) Make a small model showing that capacitor stores the charges and then use that energy to light LED. 5) With the help of two metal plates, battery, plastic/cardboard and multimeter check the dependence of capacitance on medium and distance between the plates. Project: Different projects are given.</p>	<p>* Presentation *Worksheets *Questions from CBSE sample papers * Lab Demonstration *Small models to understand the concepts. *Competency based questions</p>	<p>Class Test Worksheets</p>

<p>JULY (18)</p>	<p>Current Electricity Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, electrical resistance, V-I characteristics (linear and nonlinear), 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.</p>	<p>Students will be able to understand -- *Concept of electric current, drift velocity, mobility of electrons in a conductor. * Ohm's law, and ohmic conductors * the concept of electric power, electrical resistivity and conductivity, temp.dependance of resistance. * the internal resistance of a primary cell, cells in series and parallel, difference between emf and potential difference. * Kirchhoff's current and voltage law. * the concept of Principle of Wheatstone bridge and it's proof.</p>	<p>Activities 1) Dependance of resistance on area of cross section of wire and length of the wire. 2) To show the resistivity of constant/manganin wire at 00 and at 100 degree celcius 3) Experimental set up to verify Kirchhoff's voltage law (KVL)</p> <p>EXP.: 1) To determine resistivity of a two/three wires by plotting a graph of potential difference versus current. 2) To find resistance of a given wire/standard resistance using a metre bridge.</p>	<p>*Worksheets *Short answer type questions *Numericals based on each topic *Competency based questions *Practical based</p>	<p>PT-1</p>
<p>AUGUST (18)</p>	<p>Magnetic Effects of Current 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 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-definition of ampere. Torque experienced by a current loop in uniform magnetic field; moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter.</p>	<p>Students will be able to --- *understand the concept of magnetic field ,Oersted's experiment. *understand Biot Savart's law and it's application *understand Ampere's law and it's applications to find magnetic field due to (i)st.infinitely long wire and (ii) toroid *understand the force on a moving charge in uniform magnetic and electric fields *understand the force on a current carrying conductor in a uniform magnetic field. *understand force between two parallel current carrying conductors, definition of ampere. *understand the torque experienced by a current loop in uniform magnetic field *understand the moving coil galvanometer and related terms.</p>	<p>Activities-- 1) Demonstration of force between two long straight current carrying conductors. 2) Activity to show : current carrying conductor when placed in magnetic field experiences a force.</p> <p>EXP.: 3) To determine resistance of a galvanometer by half-deflection method and to find its figure of merit.</p>	<p>*Demonstration *Worksheets *Short answer type questions *Numericals based on each topic *Competency based questions *Practical based</p>	<p>Class Test Worksheets</p>

<p style="text-align: center;">SEPTEMBER (07)</p>	<p>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- Para-, dia- and ferro - magnetic substances with examples. Magnetization of materials, effect of temperature on magnetic properties.</p>	<p>Students will be able to--</p> <ul style="list-style-type: none"> *understand bar magnet as a solenoid *understand the magnetic field intensity due to a magnetic dipole(bar magnet) along its axis and perpendicular to it's axis understand torque on amagnetic dipole(bar magnet) in a uniform magnetic field *understand para, dia and ferro magnetic substances, with examples *understand the effect of temperature on magnetic properties. 	<p>Activity --</p> <p>3) Make a chart showing differences between dia, para and ferromagnetic materials.</p> <p>Activity1) To measure resistance,voltage(AC/DC), current(AC) and check the continuity of a given circuit.</p> <p>2) To study the variation in potential drop with length of a wire for a study current.</p> <p>3) To draw a diagram of a given circuit comprising at least a battery, a resistor/rheostat, key, ammeter and voltmeter. Mark the component that are not connected in proper order and correct the circuit and also the circuit diagram.</p>	<ul style="list-style-type: none"> *Demonstration *Worksheets *Short answer type questions *Numericals based on each topic *Competency based questions *Practical based 	<p style="text-align: center;">Term-1</p>
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<p>OCTOBER (24)</p>	<p>Electromagnetic Induction and Alternating Currents : Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Self and mutual induction. 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 and transformer.</p>	<p>*To make the students to understand about the EMI phenomenon, Faraday's law, Lenz's rule, Fleming's right hand rule and working principle of ac generator and transformer, methods to reduce losses in transformer *to make the students to define the following concepts--EMI, self induction and inductance, mutual induction and mutual inductance *to make student to differentiate between--- EMI and magnetic effect of electric current, self and mutual inductance, step up and step down transformer * to develop skill in --carrying out activities by collecting required materials, in drawing the diagrams, drawing important conclusions * to develop logical reasoning and logical thinking in deriving the important relations of various concepts * to apply the knowledge of concepts in solving the numericals from the chapter. * to identify the special features of ac, recognize the importance of rms values, phase lag/ lead of current/ in resistor inductor and capacitor</p>	<p>Activities: 1) Demonstration of conversion of mechanical energy into electrical energy. 2) Demonstration of Lenz's rule. 3) Activity showing mutual induction. 3) Make a chart showing differences between dia, para and ferromagnetic materials. EXP. 4) To find the frequency of AC mains with a sonometer.</p>	<p>*Demonstration *Worksheets *Short answer type questions *Numericals based on each topic *Competency based questions *Practical based</p>	<p>Class Test Worksheets</p>
<p>NOVEMBER (1)</p>	<p>ELECTROMAGNETIC WAVES: Basic idea of displacement current</p>	<p>Students will be able to understand the concept of displacement current in capacitor, Ampere Maxwell law.</p>		<p>*Worksheet * short answer type questions</p>	<p>Class Test Worksheets</p>
<p>DECEMBER</p>	<p>Full Syllabus</p>				<p>Term - 2</p>
<p>JANUARY</p>	<p>Full Syllabus</p>				<p>Pre-Board</p>