

NO OF PERIOD	TOPICS	SUB TOPICS	LEARNING OBJECTIVES / SKILLS TO BE DEVELOPED	ASSESSMENT EXERCISES/ ACTIVITIES/PRACTICALS	OUTCOME
13	<p><u>Unit1</u> <u>(Electrostatics)</u></p> <p><u>Ch 1</u> <u>Electric charges and fields</u></p>	<p>1)Electric Charges; Conservation of charge, Coulomb's law-force between two point charges, forces between multiple charges; superposition principle and continuous charge distribution.</p> <p>2)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.</p> <p>3)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).</p>	<p>To make the learners to understand the theoretical and mathematical concepts of Electric Charges and its Properties and Electrostatics forces and fields of different charge distributions.</p>	<ul style="list-style-type: none"> <li>• Presentation From the Students</li> <li>• Worksheets</li> <li>• CBSE Sample Paper</li> </ul>	<p>Students acquires the basic knowledge of Electric charges, concept of electrostatic force in vector form different distribution of charges, Electric field produced by different distribution of charges and its mathematical analysis.</p> <p>Student will be able to relate the phenomena of charging of a body with daily life.</p>



12	<p><b><u>Ch 2</u></b> <b><u>Electrostatic Potential and Capacitance</u></b></p>	<p>1)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.</p> <p>2)Conductors and insulators, free charges and bound charges inside a conductor.</p> <p>3)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.</p>	<p>To make the learners to understand the concept of Electric potential due to different charge distributions and its relation between electric field. Also the students will learn about the capacitance, dielectrics and its polarization.</p>	<ul style="list-style-type: none"> <li>• Presentation From the Students</li> <li>• Lab Demosntration</li> <li>• Worksheets</li> <li>• CBSE Sample Paper</li> </ul>	<p>Student will be able to relate the Electrical potential with electric field.</p> <p>Student will be able to understand the working of charge storing device i.e, capacitor.</p>
----	---	--	--	--	--

NO OF PERIOD	TOPICS	SUB TOPICS	LEARNING OBJECTIVES / SKILLS TO BE DEVELOPED	ASSESSMENT EXERCISES/ ACTIVITIES/PRACTICALS	OUTCOME
18	<p><b><u>Unit 2</u></b> <b><u>Current Electricity..</u></b></p> <p><b>Ch 3</b> <b>Current Electricity</b></p>	<p>1) 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 non-linear)</p> <p>2) electrical energy and power, electrical resistivity and conductivity, Carbon resistors, colour code for carbon resistors; series and parallel combinations of resistors; temperature dependence of resistance. Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel</p> <p>3) Kirchhoff's laws and simple applications, Wheatstone bridge, metre bridge.</p> <p>4) Potentiometer - principle and</p>	<p>To make the learners to understand the concept Electricity, resistance and resistivity and the parameters affecting it with its link to our daily life.</p> <p>To make the learners to understand the concept of different electrical devices like wheat stone bridge and its application in meter bridge and potentiometer with real life application.</p>	<ol style="list-style-type: none"> <li>1. To determine resistance per cm of a given wire by plotting a graph for potential difference versus current.</li> <li>2. To find resistance of a given wire using metre bridge and hence determine the resistivity (specific resistance) of its material.</li> <li>3. To verify the laws of combination (series) of resistances using a metre bridge.</li> <li>4. To verify the laws of combination (parallel) of resistances using a metre bridge.</li> <li>5. To compare the EMF of two given primary cells using potentiometer.</li> <li>6. To determine the internal resistance of given primary cell using potentiometer.</li> <li>7. To determine resistance of a</li> </ol>	<p>Students are able to understand the concept of Potential difference and current and also the process of finding the unknown current in a loop using KVL and KCL.</p> <p>Students will be able to understand the practical application of resistors and cells and its different combination in real life.</p> <p>Students will be able to operate different electrical instruments like POT, Meter bridge, Galvanometer, Voltmeter, ammeter etc. also they learned to find the least count of given measuring instrument.</p>



		its applications to measure potential difference and for comparing EMF of two cells; measurement of internal resistance of a cell.		galvanometer by half-deflection method and to find its figure of merit. 8. To convert the given galvanometer (of known resistance and figure of merit) into a voltmeter of desired range and to verify the same. 9. To convert the given galvanometer (of known resistance and figure of merit) into an ammeter of desired range and to verify the same.	
--	--	--	--	--	--

NO OF PERIOD	TOPICS	SUB TOPICS	LEARNING OBJECTIVES / SKILLS TO BE DEVELOPED	ASSESSMENT EXERCISES/ ACTIVITIES/PRACTICALS	OUTCOME
13	<p><b><u>Unit 3</u></b> <b><u>Magnetic effects of current and Magnetism</u></b></p> <p><b>Ch 4 Moving charges and Magnetism</b></p>	<p>1)Concept of magnetic field, Oersted's experiment.</p> <p>2)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 (only qualitative treatment), force on a moving charge in uniform magnetic and electric fields, Cyclotron.</p>	<p>To make the learners to understand the concept of relation between electricity and magnetism and analysis of magnetic field for different kind of symmetrical structure.</p> <p>To make the learners to understand the concept different measuring devices like galvanometer, voltmeter and ammeter and interrelation between them.</p>	<p>Experimental demonstration of Oersted's experiment.</p> <p>Experimental demo of Plotting of Magnetic Field lines for Bar Magnet</p>	<ul style="list-style-type: none"> <li>• Student will learn about the relation between electricity and Magnetism and different methods to find the Magnetic field due to different types of conductor.</li> <li>• Student will learn about the force between two parallel conductors and its mathematical analysis depending upon the directions of current.</li> </ul>
13		<p>3)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;</p> <p>4)moving coil galvanometer-its current sensitivity and conversion toammeter and voltmeter.</p>	<p>To make the learners to</p>		<ul style="list-style-type: none"> <li>• Student will learn about the conversion of galvanometer into ammeter and voltmeter of desired range.</li> </ul>



	<p><b>Ch 5 Magnetism and Matter</b></p>	<p>1)Current loop as a magnetic dipole and its magnetic dipole moment, magnetic dipole moment of a revolving electron, 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; earth's magnetic field and magnetic elements.</p> <p>2)Para-, dia- and ferro - magnetic substances, with examples. Electromagnets and factors affecting their strengths, permanent magnets.</p>	<p>understand the different kinds of magnetic material and earth's magnetic field.</p>	<p>Concept of Earth's Magnetic field by Tangent Galvanometer</p>	
--	---	---	--	--	--

NO OF PERIOD	TOPICS	SUB TOPICS	LEARNING OBJECTIVES / SKILLS TO BE DEVELOPED	ASSESSMENT EXERCISES/ ACTIVITIES/PRACTICALS	OUTCOME
12	<p><u>Unit 4</u> <u>EMI and AC</u></p> <p><u>Ch 6 EMI</u></p>	<p>1)Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Eddy currents.</p> <p>2)Self and mutual induction.</p>	<p>To make the learners to understand the concept Electromagnetic Induction of single and double coil.</p>		<p>Students will learn about the different method to induce an emf in a given conductor which is useful to understand the concept of Mutual and self induction.</p>
15	<p><u>Ch 7 AC</u></p>	<p>1)Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LC oscillations (qualitative treatment only), LCR series circuit, resonance; power in AC circuits, wattless current.</p> <p>2)AC generator and transformer.</p>	<p>To make the learners to understand the application based concept of Electromagnetic Induction (Generator, Transformer, choke coil)</p>	<p>10. To find the frequency of AC mains with a sonometer.</p>	<p>Students acquires the basic knowledge about the Principle construction working and real life application of Transformer and Dynamo</p>



6	<p><b><u>Unit 5</u></b>  <b><u>Electromagnetic Wave</u></b></p> <p><b><u>Ch 8 EMW</u></b></p>	<p>1)Basic idea of displacement current, Electromagnetic waves, their characteristics, their Transverse nature (qualitative ideas only).</p> <p>2)Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.</p>	<p>To make the learners to understand the generation and real life application of electromagnetic wave depending upon the value of wavelength and frequency.</p>	<p>Group Discussion to discuss the Practical Applications of EMW in field of Communication, Medical, etc.</p>	<p>Student acquires knowledge about the Practical application of EMW in our Daily life.</p>
---	---	---	--	---	---

NO OF PERIOD	TOPICS	SUB TOPICS	LEARNING OBJECTIVES / SKILLS TO BE DEVELOPED	ASSESSMENT EXERCISES/ ACTIVITIES/PRACTICALS	OUTCOME
18	<p><u>Unit 6 Optics</u></p> <p><u>Ch 9 Ray Optics and Optical Instruments</u></p>	<p><b>1)Ray Optics:</b> 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, lensmaker's formula, magnification, power of a lens, combination of thin lenses in contact, combination of a lens and a mirror, refraction and dispersion of light through a prism.</p> <p>2)Scattering of light - blue colour of sky and reddish appearance of the sun at sunrise and sunset.</p> <p>3)Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.</p>	<p>To make the learners to understand the applications of different lenses, mirrors and optical instrument in our daily life.</p>	<ol style="list-style-type: none"> <li>1. To find the value of <math>v</math> for different values of <math>u</math> in case of a concave mirror and to find the focal length.</li> <li>2. To find the focal length of a convex mirror, using a convex lens.</li> <li>3. To find the focal length of a convex lens by plotting graphs between <math>u</math> and <math>v</math> or between <math>1/u</math> and <math>1/v</math>.</li> <li>4. To find the focal length of a concave lens, using a convex lens.</li> <li>5. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.</li> <li>6. To determine refractive index of a glass slab using a travelling microscope.</li> </ol>	<p>Student will learn about the different types of mirror and lenses and respective ray diagrams for image formation along the mathematical tactics and Analysis.</p> <p>Student will learn the different optical phenomena of in our daily life like Colour of a sky and cloud, Advanced sunrise and delayed sunset etc.</p>
15	<p><u>Ch 10 Wave Optics</u></p>	<p><b>1)Wave optics:</b> Wave front and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts.</p> <p>2)Proof of laws of reflection and</p>	<p>To make the learners to understand the difference between ray optics and wave optics and different optical phenomena such as interference,</p>	<ol style="list-style-type: none"> <li>6. To determine refractive index of a glass slab using a travelling microscope.</li> </ol>	



		<p>refraction using Huygen's principle.          3) Interference, Young's double slit experiment and expression for fringe width, coherent sources and sustained interference of light, diffraction due to a single slit, width of central maximum          4) resolving power of microscope and astronomical telescope, polarisation, plane polarised light, Brewster's law, uses of plane polarised light and Polaroids.</p>	<p>diffraction and polarization of a light wave.</p>	<p>7. To find refractive index of a liquid by using convex lens and plane mirror.</p>	<p>Student are able to differentiate between the ray and wave nature of a light</p>
--	--	--	--	---	---

NO OF PERIOD	TOPICS	SUB TOPICS	LEARNING OBJECTIVES / SKILLS TO BE DEVELOPED	ASSESSMENT EXERCISES/ ACTIVITIES/PRACTICALS	OUTCOME
7	<p><b><u>Unit 7 Dual Nature of Radiation and Matter</u></b></p> <p><b><u>Ch 11 Dual Nature of Radiation and Matter</u></b></p>	<p>1)Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light.</p> <p>2)Matter waves-wave nature of particles, de-Broglie relation, Davisson-Germer experiment (experimental details should be omitted; only conclusion should be explained).</p>	<p>To make the learners to understand the dual nature of radiation of light as practical and wave.</p>	<ul style="list-style-type: none"> <li>• Presentation From the Students</li> <li>• Worksheets</li> <li>• CBSE Sample Paper</li> </ul>	<p>Learners will be able to understand the dual nature of light (Wave and Particle) along with experimental and mathematical verification.</p>
7	<p><b><u>Unit 8 Atoms and Nuclei</u></b></p>	<p>1)Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum.</p>	<p>To make the learners to understand the basic structure of atoms and nucleus proposed by different scientists and its importance in our life.</p>	<ul style="list-style-type: none"> <li>• Presentation From the Students</li> <li>• Worksheets</li> <li>• CBSE Sample Paper</li> </ul>	<p>Learners will be able to understand the Concept of atoms and nuclei with help of different models developed by different scientists (Rutherford's model, bohr's model etc.)</p>
7	<p><b>Ch 12 Atoms</b></p> <p><b>Ch 13 Nuclei</b></p>	<p>1)Composition and size of nucleus, Radioactivity, alpha, beta and gamma particles/rays and their properties; radioactive decay law.</p> <p>2)Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission, nuclear fusion.</p>			

NO OF PERIOD	TOPICS	SUB TOPICS	LEARNING OBJECTIVES / SKILLS TO BE DEVELOPED	ASSESSMENT EXERCISES/ ACTIVITIES/PRACTICALS	OUTCOME
20	<p><u>Unit 9</u> <u>Electronic Devices</u></p> <p><u>Ch 14</u> <u>Semiconductor Electronics: Materials, Devices and Simple Circuits</u></p> <p><u>Unit 10</u> <u>Communication</u></p>	<p>1)Energy bands in conductors, semiconductors and insulators (qualitative ideas only)</p> <p>2)Semiconductor diode - I-V characteristics in forward and reverse bias, diode as a rectifier; Special purpose p-n junction diodes: LED, photodiode, solar cell and Zener diode and their characteristics, zener diode as a voltage regulator.</p> <p>3)Junction transistor, transistor action, characteristics of a transistor and transistor as an amplifier (common emitter configuration), basic idea of analog and digital signals, Logic gates (OR, AND, NOT, NAND and NOR).</p>	<p>To make the learners to understand the importance and significance of semiconducting devices in our daily and how they are different from conductor and insulator by explaining different semiconducting devices.</p>	<p>8. To draw the I-V characteristic curve for a p-n junction in forward bias and reverse bias.</p> <p>9. To draw the characteristic curve of a zener diode and to determine its reverse break down voltage.</p> <p>10. To study the characteristic of a common - emitter <i>nnp</i> or <i>pnp</i> transistor and to find out the values of current and voltage gains.</p>	<p>Learners will be able to understand the Concept of Conductors, Insulator and semiconductor with the help of Band Energy Theory.</p> <p>Learners will be able to understand the Classification of semiconductors along with Practical applications in PN diode, Rectifiers, Optoelectronic devices, Transistor (Amplifier and switch) and Logic Gates.</p>



15	<u>Ch 15</u> <u>Communication Systems</u>	<p>1)Elements of a communication system (block diagram only); bandwidth of signals (speech, TV and digital data); bandwidth of transmission medium.</p> <p>2)Propagation of electromagnetic waves in the atmosphere, sky and space wave propagation, satellite communication.</p> <p>3)Need for modulation, amplitude modulation and frequency modulation, advantages of frequency modulation over amplitude modulation. Basic ideas about internet, mobile telephony and global positioning system (GPS)</p>	To make the learners to understand the application based concept of communication system and make them to aware about the functioning of our communication system.		<p>Learners will be able to understand the Concept Communication technology with basic block diagram and different modulation technique with graphical and Mathematical analysis.</p> <p>Learners will be able to understand the Concept Communication technology with different modes of propagation along with respective Merits and Demerits with practical applications</p>
		PRE BOARDS			
	REVISION	REVISION			
MARCH		REVISION AND EXAMS			