



MONT H/NO. OF WORKI NG DAYS	UNITS/TOPICS	SUB TOPICS	LEARNING OBJECTIVES / SKILLS TO BE DEVELOPED	ASSESSMENT EXERCISES/ ACTIVITIES/PRACTICALS	OUTCOME
APRIL (23)	<u>Unit1</u> <u>(Electrostatics)</u> <u>Ch 1</u> <u>Electric charges and fields</u>	1)Electric Charges; Conservation of charge, Coulomb's law-force between two point charges, forces between multiple charges; superposition principle and continuous charge distribution. 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.	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.	<ul style="list-style-type: none"> • Presentation From the Students • Worksheets • CBSE Sample Paper 	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. Student will be able to relate the phenomena of charging of a body with daily life.

		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).		
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<p>APRIL (23)</p>	<p>Ch 2 <u>Electrostatic Potential and Capacitance</u></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"> • Presentation From the Students • Lab Demosntration • Worksheets • CBSE Sample Paper 	<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>
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MAY (08)	<u>Unit 2</u> <u>Current</u> <u>Electricity..</u> Ch 3 Current Electricity	<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, series and parallel combinations of resistors; temperature dependence of resistance.</p> <p>Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel</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"> To determine resistance per cm of a given wire by plotting a graph for potential difference versus current. To find resistance of a given wire using metre bridge and hence determine the resistivity (specific resistance) of its material. To verify the laws of combination (series) of resistances using a metre bridge. To verify the laws of combination (parallel) of resistances using a metre bridge. To compare the EMF of two given primary 	<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,</p>

JUNE (11)	3) Kirchhoff's laws and simple applications, Wheatstone bridge, metre bridge.	cells using potentiometer.	Galvanometer, Voltmeter, ammeter etc. also they learned to find the least count of given measuring instrument.
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				<p>galvanometer by half-deflection method and to find its figure of merit.</p> <p>6.To convert the given galvanometer (of known resistance and figure of merit) into a voltmeter of desired range and to verify the same.</p> <p>7.To convert the given galvanometer of known resistance and figure of merit) into an ammeter of desired range and to verify the same.</p>	
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JULY (26)	<p><u>Unit 3</u> <u>Magnetic effects of current and Magnetism</u></p> <p>Ch 4 Moving charges and Magnetism</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.</p> <p>3) Force on a current-carrying conductor in a uniform magnetic field, force between two parallel</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</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"> • Student will learn about the relation between electricity and Magnetism and different methods to find the Magnetic field due to different types of conductor. • Student will learn about the force between two parallel

	<p>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 to ammeter and voltmeter.</p>	<p>between them.</p> <p>To make the learners to</p>	<p>conductors and its mathematical analysis depending upon the directions of current.</p> <ul style="list-style-type: none">• Student will learn about the conversion of galvanometer into ammeter and voltmeter of desired range.
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	Ch 5 Magnetism and Matter	<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.</p> <p>2)Para-, dia- and ferro - magnetic substances, with examples. Electromagnets and factors affecting their strengths, permanent magnets.</p>	understand the different kinds of magnetic material.		
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JULY (26)	<p><u>Unit 4</u> <u>EMI and AC</u></p> <p><u>Ch 6 EMI</u></p> <p><u>Ch 7 AC</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>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>To make the learners to understand the concept Electromagnetic Induction of single and double coil.</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 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> <p>Students acquires the basic knowledge about the Principle construction working and real life application of Transformer and Dynamo</p>

		2)AC generator and transformer.			
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	<p><u>Unit 5</u> <u>Electromagnet</u> <u>ic Wave</u></p> <p><u>Ch 8 EMW</u></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>
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AUG (23)	<u>Unit 6 Optics</u> <u>Ch 9 Ray</u> <u>Optics and</u> <u>Optical</u> <u>Instruments</u>	1) Ray Optics: Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and its applications, optical fibres,	To make the learners to understand the applications of different lenses, mirrors and optical instrument in our daily life.	1. To find the value of v for different values of u in case of a concave mirror and to find the focal length.	Student will learn about the different types of mirror and lenses and respective ray diagrams for image formation along the mathematical tactics

AUG (23)	<u>Ch 10 Wave Optics</u>	<p>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) Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.</p> <p>1) Wave optics: 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>	To make the learners to understand the difference between ray optics and wave optics and different optical phenomena such as interference,	<p>2. To find the focal length of a convex mirror, using a convex lens.</p> <p>3. To find the focal length of a convex lens by plotting graphs between u and v or between $1/u$ and $1/v$.</p> <p>4. To find the focal length of a concave lens, using a convex lens.</p> <p>5. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.</p> <p>6. To determine refractive index of a glass slab using a travelling microscope.</p>	<p>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>
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		<p>refraction using Huygen's principle.</p> <p>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</p> <p>4) resolving power of microscope and astronomical telescope.</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>
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SEPT (23)	<u>Unit 7 Dual Nature of Radiation and Matter</u> <u>Ch 11 Dual Nature of Radiation and Matter</u>	1) Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation- particle nature of light. 2) Matter waves-wave nature of particles, de-Broglie relation, Davisson-Germer experiment (experimental details should be omitted; only conclusion should be explained).	To make the learners to understand the dual nature of radiation of light as practical and wave.	<ul style="list-style-type: none"> • Presentation From the Students • Worksheets • CBSE Sample Paper 	Learners will be able to understand the dual nature of light (Wave and Particle) along with experimental and mathematical verification.
OCT (19)	<u>Unit 8 Atoms and Nuclei</u> Ch 12 Atoms	1) Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum. 1) Composition and size of nucleus, Radioactivity, alpha, beta and gamma particles/rays and their properties; radioactive decay law. 2) Mass-energy relation, mass defect; binding energy per nucleon and its	To make the learners to understand the basic structure of atoms and nucleus proposed by different scientists and its importance in our life.	<ul style="list-style-type: none"> • Presentation From the Students • Worksheets • CBSE Sample Paper 	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.)

	Ch 13 Nuclei	variation with mass number; nuclear fission, nuclear fusion.			
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NOV (19)	<p><u>Unit 9</u> <u>Electronic</u> <u>Devices</u></p> <p><u>Ch 14</u> <u>Semiconductor</u> <u>Electronics: M</u> <u>aterials,</u> <u>Devices and</u> <u>Simple</u> <u>Circuits</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>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>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.</p>

Session-2026-27

Class: XII

Subject: PHYSICS

SANT NANDLAL SMRITI VIDYA MANDIR, GHATSILA

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DECEMBER (19)	REVISION	PRE BOARDS			
JANUARY (20)					
FEBRUARY (23)	REVISION	REVISION AND EXAMS			
MARCH (22)		REVISION AND EXAMS			

Name of Subject Teacher/s: 1) Mr. Tapan Mahata
2) Mr. Pankaj Kumar

Principal