BUDHA DAL PUBLIC SCHOOL

SAMANALESSON PLAN SESSION

2023 – 2024

CLASS: XII

SUBJECT:PHYSIS

Month & Working Days	Theme/ Sub-theme	Learning Objectives		Activities &Resources	Art .int. act	
		Subject Specific (Content Based)	Behavioural (Application based)			

March	**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 ona	Student will be able to • Understand the concept of charge • Understand concept of electrostatic force and field. • State the Coulomb'slaw of electrostaticforce. • Understand the concept potential. • Understand the concept of capacitor. • Understand the electric dipole and electric field due to an electricdipole. • Understand the electric potential and potential gradient. • Understand the potential energy and torque due to	Students will be able to.. • Apply the concept of static electricity in selection of cloths as per the weather conditions • By using the concept of electrostatic s students can protect themselves from lightning. • Distinguish between parallel plate and cylindrical capacitors	**Teacher will start the topic by asking the following questions related to the previous knowledge** **1. When we take off our synthetic shirts or nylon sweaters a spark is produced. Why?** **2.** By rubbing palms we experience a different feeling.Why? **3.** Why does the mustard seeds adhere to the walls of the polythene bag **4.** If an electrically charged rod is brought near normal flow of water from a tap, the flow gets slightly diverted towardsthe	Teacher will explain charging by rubbing , by taking example of rubbing of balloons and glass rod and silk cloths	Students have learned • The concept electrostatic force and field The application of torque in rotating a dipole Energy of a capacitor and uses of capacitor in different appliances. • The applications of Gauss's theorem • Drawing the electric field lines and presence of electricfield.

	dipole in uniform electric fleld. 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 electric dipole.	and their uses . • Apply the concept and principle of capacitor in forming home made capacitor. • Apply the concept of charging to charge any conductor at home.	rod. Why? Now according to the response of the students the explaination of the topic will be started ,through lecture method the concept of force and electric field will be explained. By demonstrating the activity of charging polythene and glass rod by rubbing to each other the types of charges and property of attraction of two unlike charges will be explained. By lecture method concept of potential and electric field will be explained. Using regulators of a fan the construction ang working of capacitors will be discussed. Assignment questions… 1. Plotting of graph showing the variation of Coulomb force		

	an electrostatic field. Conductors and			versus distance between two similar and two dissimilar		

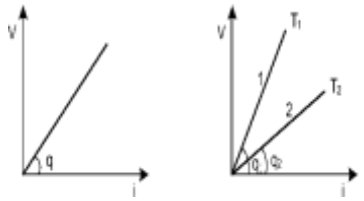
	insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor. Van de Graaff generator.			charges. 2. How you can charge a metal sphere negatively without touching? 3. Drawing of electric field lines around the charges. 4. Applications of Gauss'stheorem. 5. Numerical questions on capacitors.		

April, And May	**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,	Student will be able to • Understand the concept of electric current and potential difference. • Understand the difference between drift velocityand mobility of electrons in a conductor. • State the Ohm's lawand understand the Ohmic conductor. • Understand the concept of electric power, electrical resistivityand	• Apply the concept of current and potential difference on measuring the resistance of conductor /electrical appliances at home. • Apply the concept	**i)**First of all teacher will ask the questions based on their previous knowledge. The teacher will explain the electric current its uses and he electrical appliances which draw more or less current in accordance with their resistance. ***Ampere:*** of current meansthe flow of electrons/sec through any		**Students will be asses on the basis of their observation and accuracy skills**

6.25×10^{18}

	Current Electricity (Cont.) V-I characteristics (linear and non-linear), 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. Kirchhoff's laws and simple	conductivity. . • Understand thedifference between resistance and resistivity. • Understand the colour coding in carbon resistor and the dependence of internal resistance of a cell on itstemperature. • Understand the concept of combination of resistances • Know the difference between emf andpotential difference. • State the Kirchhoff's vltage and currentlaw. • Understand principle of wheatstone bridge and potentiometer.	mobility of electrons in calculating the drift velocity in different conductor s and alloy. • Student will be able to plot the graph between the Vand I and then they will calculate the resistance of conductor by the slope of samegraph. • Apply the concept for electrical power and energy to calculate the electricity bill of their home, factory or offices. Apply the concept of series and parallel combination of resistances if desired	cross-section of the conductor The conventional direction of current is taken to be the direction of flow of positive charge, i.e. field and is opposite to the direction of flow of negative charge as shown below.  The net charge in a current carrying conductor is zero. For a given conductor current does not change with change in cross- sectional area. In the following figure ii)The teacher will explain the graph between V and I ,and will explain them the calculation of R by the slopeof graph. law is not a universal law, the		

	applications.			substances, which obey ohm's  $i_1 = i_2 = i_3$		

	Wheatstone bridge, metre bridge. Potentiometer - principle and its applications to measure potential difference and for comparing emf of two cells; measurement of internal resistance of a cell.			law are known as ohmic nce. Graph between V and i for a metallic conductor is a straight line asshown. At different temperatures V-i curves aredifferent.  **Class room Activites :** i. Teacher will demonstrate the emf of a cellpurchasedfrom market. i.Teacherwill demonstrate the how student will calculate the total no. Of electrons in 1 kgwater.. i. Teacher will show the electrolyte used in different cell which is being used in laboratory. **Lab activities:** i. Measurement of unknown resistance by wheat stonebridge. i. Measurement of specific resistance by wheat stonebridge.		

				i. Comparisonof		

				emfx of two primary cell using potentiometer. . Measurement of internal resistance ofcell using potentiometer.		
June ,17 July,10	**Magnetic effect of current and Magnetism** **Electromagnetic Induction** 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 electricfields. Cyclotron. Force on a current-carrying	Student will be able to • Understand the concept of magnetic field and Oerested experiment. • State the Biot savart's law. • State the Ampere'slaw. • Understand the force on a moving charge in uniform magnetic and electric fields. • Understand the principle of cyclotron and its working. • Understand the force on a current-carrying conductor in a uniform magneticfield. • Understand force between two parallel current-carrying conductors-definitionof ampere. • Understand the torque experienced by a current loop in uniform magnetic field. • Understand the moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter.	• Applythe concept of Biot savart's law in calculating the magnetic field due to current carrying circular loop and straight conductor. • Apply the Ampere's law to calculatethe magnetic field due to infinitely long straight wire, straight and toroidal solenoids's • Student will be able to plot the graph between the Band r. • Apply the concept Cyclotron in solving the	**Class room Activites :** iv. Teacher will demonstrate the presence of magnetic field due to current carryingconductor. . Teacher will demonstrate the force experience by current carrying conductor placed in uniform magneticfield. **i.**Teacher will demonstrate the model of galvanometer in theclass. i. The teacher will demonstrate the magnetic lines of force due to a bar magnet in the class . i. The teacher will demonstrate the magnetic lines of force due to a bar magnet in the class. . The teacher will demonstrate the solenoid and its magnetic poles in the class. **Lab activities or Project**	• The conceptof magnetic field and Oerested experiment . • Statement the Biot savart'slaw. • Statement the Ampere'slaw. • Statement of the force on a moving charge in uniform magnetic and electricfields. • Statement of the principle of cyclotron and its working. • The force on a current-carrying conductor in a uniform magnetic field. • The force between two parallel current- carrying conductors-definition of ampere. • The torque experienced by a current loop in uniform magnetic field.	**Students will be asses on the basis of their observation and accuracy skills**

	conductor in a uniform	• Know the Currentloop	numerical. • Applythe	v. Measurement of		

	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. 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 andperpendicular to its axis. Torque on a magnetic dipole (bar magnet) in	as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron. • Understand the 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. • Para-, dia- and ferro - magnetic substances , with examples.	concept of force on a current carrying conductor in d.c motor . • Apply the concept of torque experienced by a current loop in uniform magnetic field on moving type galvanometer . • Student will be able to calculate the current and voltage sensitivity of moving coil galvanometer . • Students will be able to calculate the torque on a magnet placed in uniform magnetic field.	magnetic moment of bar magnet. i. Reduction factor of tangentgalvanometer. i. Magnetic field intensity of n number of turns of the coil used inT.G.	• The movingcoil galvanometer-its current sensitivity and conversion to ammeter and voltmeter . • The Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolvingelectron. • The magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis. • The Torque on a magnetic dipole (bar magnet) in a uniform mag	**Students will be asses on the basis of their observation and accuracy skills**

	a uniform magnetic field; bar magnet as an	pmagnets and factors affecting their strengths. Permanent magnets.	• Students will be able to differentiate between permanent		netic field; bar	

July,16 **Aug,10** **Aug,10** **Sep,24**	equivalent solenoid, magnetic field lines; Earth's magnetic field and magnetic elements. Para-, dia- and ferro - magnetic substances, with examples. Electromagnets and factors affecting their strengths. Permanent magnets. Electromagnetic induction; Faraday's laws, induced emf and current; Lenz's Law, Eddy currents. Self and mutual induction. Alternating currents, peak and rms value of alternating current/voltage; reactance and impedance; LC oscillations (qualitative treatment only), LCR series	• Understand the concept of reflection of light, spherical mirrors, mirror formula. • Understand the Refraction of light, total internal reflection. • State the laws of reflection andrefraction.. • Understand the refraction at spherical surfaces, lenses, thin lens formula, lens-maker'sformula. • Understand the magnification , power	magnet and temperory magnet by observing area of Hysteresis curve.	**Lab Activities:** i) Focal length of convexlens. ii) Focal length ofconcave mirror. iii) Focal length ofconvex mirror using convexlens. iv) Focal length ofconcave lens using convexlens	magnet as an equivalent solenoid, magnetic field lines; Earth's magnetic field and magnetic elements. • The Para-, dia- and ferro-magnetic substances, with examples.	

	circuit,	of a lens, combination of thin lenses incontact,			omagnets and factors	

	resonance; power in AC circuits wattless current. AC generator and transforme r **Ray optics** **Wave optics** Reflection of light, spherical mirrors, mirror formula. Refraction of light, total internal reflection and its applications, optical fibres,	combination of a lens and a mirror. • Understand the Refraction anddispersion of light through aprism. • Understand the Scattering of light - blue colour of sky and reddish apprearance of the sun at sunrise and sunset. • Understand the Human eye, image formationand accommodation, correction of eye defects (myopia, hypermetropia) usinglenses. • Understand the microscopes and astronomical telescopes (reflecting andrefracting) and their magnifying powers. • Understand the concept of photoelectriceffect. • Understand the threshold frequency.	• Apply the concept of refraction in finding the refractive index of a		affecting their strengths. Permanent magnets. • The concept of reflection oflight, spherical mirrors, mirrorformula. • Statement of Refraction oflight, total internal reflection. • the the refraction at spherical surfaces, lenses, thin lens formula, lens-maker'sformula. • magnification , power of a lens, combination of thin lenses in contact, combination of a lens and amirror. • the microscopes and astronomical telescopes (reflecting and	

	refraction at	• State the laws of photoelectriceffect. • Understandthe			refracting) and their magnifyingpowers.	

Oct. ,22 Nove, 10	spherical surfaces, lenses, thin lens formula, lens-maker'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. Scattering of light - blue colour of sky and reddish apprearance of the sun at sunrise and sunset. Optical instruments: Human eye, image formation &accommodation, correction of eye defects (myopia, hypermetropia) using lenses. fronts. Proof of laws of	Einsyein's photoelectric equation. • Understand the Davisson and GermerExperiment. • Understand the Einstein'sphotoelectric equation. Understand the Davisson and Germer Experiment • Understand the Rutherfordexperiment • Understand the Bohr model, energy levels, hydrogenspectrum. • State the laws of photoelectriceffect. • Understand the n type and p type semiconductor • Understand the diode • Understand the transistor and its characteristics. • Understand the energy band gaps in	glass slab with thehelp of possible. • Application the concept of TIR in cables used in computers and transmission ofData. • Student will be able to apply the refraction of light insound. • Student will be able to apply the concept of focal length to calculate the focal length of combination oflenses. - • Students can construct the astronomical telescope of desired magnification using the concept of angular magnification ..		• Students will be able to calculate the focal lengthof their father's convexlens.	**Students will be asses on the basis of their observation and accuracy skills**

	reflection and	conductor,semic o nductor and insulator				

	refraction using Huygen's principle. 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. Microscopes and astronomical telescopes (reflecting & refracting) and their magnifying powers.Wave optics: Wave front & Huygen's principle, reflection and refraction of plane wave at aplane surface using wave	**Revision**	• Students can applying the scattering of light concept in day to day life conditions.			

Nov,10. Dec,20	Optics(cont.) Resolving power of microscopes and astronomical telescope. Polarisation, plane polarised light, Brewster's law, uses of plane polarised light and Polaroids. Dual nature of matter and EM Waves. Dual nature of radiation. Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light. Matter waves-wave nature of particles, de Broglie relation.		• Apply the concept of dual nature in day to daylife	**Lab Activities** Characteristic of PN junction diode. Characteristics of Zener diode. Transistor characteristics.		

	Davisson-Germer					

	experiment (experimenta l details should be omitted; only conclusion should be explained). **Atom and Nuclei** **Atom and Nuclei(Cont.)** Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum. Compositionand 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, **Electronic devices** Energy bands in solids (Qualitative ideas only) conductor, insulator and semiconductor; semiconductor diode – I-V characteristics in forward and reverse bias, diode as a rectifier; I-Vcharacteristics of LED, photodiode, solar cell, and Zener diode; Zener diode as a voltage regulator.					

	January,23 & Feb,05					
