

The Orchid School
Baner
Weekly Syllabus Overview 2015- 2016
Std : XII
Subject : Physics

Month	Lesson / Topic	Expected Learning Objective	Activities/ FAs Planned	Remark
March				
APRIL	RAY OPTICS: 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	Students understand about nature of light and gain knowledge about mirrors and lenses	1. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.	
	Magnification, power of a lens, combination of thin lenses in contact, combination of a lens and a mirror	Students understand about magnification.		
	Refraction and dispersion of light through a prism. Scattering of light - blue colour of sky and reddish appearance of the sun at sunrise and sunset.	Students understand about scattering of light and rainbow		

	Optical instruments : Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.	Students observe different optical instrument	Activity 1: To obtain a lens combination with the specified focal length by using two lenses from the given set of lenses.	
MAY	WAVE OPTICS: Wave front and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygen's principle. Interference, Young's double slit experiment and expression for fringe width	Students understand about wave nature and gain knowledge about different light phenomenon.	2. To determine resistance per cm of a given wire by plotting a graph of potential difference versus current.	
	coherent sources and sustained interference of light. Diffraction due to a single slit, width of central maximum. Resolving power of microscopes and astronomical telescope. Polarisation, plane polarised light, Brewster's law, uses of plane polarised light and Polaroids.	students understand the difference between coherent and incoherent sources and gain knowledge about diffraction and polarization.	3. To determine refractive index of a glass slab using a travelling microscope.	
	STRUCTURE OF AN ATOM: Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum.	Students understand about structure of an atom through various model of an atom	4. To find resistance of a given wire using metre bridge and hence determine the resistivity (specific resistance) of its	

JUNE

<p>CURRENT ELECTRICITY: Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; electrical resistivity and conductivity. Carbon resistors, colour code for carbon resistors; series and parallel combinations of resistors;</p>	<p>Students understand about current electricity and various combinations of resistors</p>	<p>5. . To verify the laws of combination (series/parallel) of resistances using a metre bridge.</p>	
<p>Ohm's law, electrical resistance, V-I characteristics (linear and nonlinear), electrical energy and power, 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 applications</p>	<p>Students understand the concept of ohm's law and its applications</p>	<p>6. To compare the EMF of two given primary cells using potentiometer.</p>	
<p>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.</p>	<p>Students understand potentiometer and its applications</p>	<p>7. To find the value of v for different values of u in case of a concave mirror and to find the focal length.</p>	

UT 1

JULY

<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.</p>	<p>Students gain knowledge about static electricity</p>	<p>8. To find the focal length of a convex mirror, using a convex lens.</p>	
<p>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>Students gain knowledge about electric field its magnitude and direction</p>	<p>9. 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>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>Students gain knowledge about electric flux</p>	<p>Activity 2: To measure resistance, voltage (AC/DC), current (AC) and check continuity of a given circuit using multimeter.</p>	
<p>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>Students gain knowledge about electric potential</p>		
<p>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.</p>	<p>students understand the concept of free charges and also understand the combination of series and parallel capacitance</p>		

AUG	<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.</p>	<p>students understand the concept of magnetism</p>	<p>Activity 3:To identify a diode, an LED, a transistor, an IC, a resistor and a capacitor from a mixed collection of such items.</p>	
	<p>Straight and toroidal solenoids, force on a moving charge in uniform magnetic and electric fields. Cyclotron.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>students gain knowledge about force on a moving charge</p>	<p>10. To determine the internal resistance of given primary cell using potentiometer.</p>	
	<p>moving coil galvanometer-its current sensitivity and conversion to ammeter andvoltage meter. Current loop as a magnetic dipole and its magnetic dipole Moment.Magnetic dipole moment of a revolving electronMagnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis.</p>	<p>Students understands the difference between conservative and non conservative force</p>	<p>11. To draw the I-V characteristic curve of a p-n junction in forward bias and reverse bias.</p>	

	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. Electromagnets and factors affecting their strengths. Permanent magnets.	Students gain knowledge about para,dia and fero magnetism.		
SEPT	ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENTS: Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Eddy currents.	students understand the Faraday's law	12.To draw the characteristic curve of a zener diode and to determine its reverse break down voltage.	
	Self and mutual induction. Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LC oscillations (qualitative treatment only), LCR series circuit, resonance	students gain knowledge about self and mutual induction	13.. To convert the given galvanometer (of known resistance and figure of merit) into an ammeter and voltmeter of desired range and to verify the same.	
	power in AC circuits, wattless current. AC generator and transformer.	students acquire knowledge about power in AC circuits	14. To find the focal length of a concave lens, using a convex lens.	
	ELECTROMAGNETIC WAVES: Need for displacement current, Electromagnetic waves and their characteristics (qualitative ideas only). Transverse nature of electromagnetic waves.	students gain knowledge about electromagnetic waves		

	Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.	students understand X rays ,Gama rays		
Term 1 Exam				
OCT	DUAL NATURE OF RADIATION: 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	students gain knowledge about dual nature of radiation	15.To study the characteristic of a common - emitter npn or pnp transistor and to find out the values of current and voltage gains.	
	de Broglie relation. Davisson-Germer experiment (experimental details should be omitted; only conclusion should be explained).	students gain knowledge about Davisson Germer experiment		
	NUCLEI :Composition and size of nucleus, 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, nuclear fusion.	students understand structure of a nuclei.		

	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-V characteristics of LED,	students acquire knowledge about different electronic devices.	Activity 4: To draw the diagram of a given open circuit comprising at least a battery, resistor/rheostat, key, ammeter and voltmeter. Mark the components	
NOV	photodiode, solar cell, and Zener diode; Zener diode as a voltage regulator. Junction transistor, transistor action, characteristics of a transistor, transistor as an amplifier	students gain knowledge about photocells and their working		
	(common emitter configuration). Logic gates (OR, AND, NOT, NAND and NOR).	students acquire knowledge about different types of GATES		
	COMMUNICATION SYSTEM: Elements of a communication system (block diagram only); bandwidth of signals (speech, TV and digital data); bandwidth of transmission medium. Propagation of electromagnetic waves in the atmosphere, sky and space wave propagation. Need for modulation. Production and detection of anamplitude-modulated wave. Basic ideas about internet, mobile telephony and global positioning system (GPS)	students understand the communication system and its use in daily life		
FIRST PRE BOARD EXAM AND REVISION				

DEC

SECOND PRE BOARD EXAM AND REVISION

PRACTICAL EXAM AND REMEDIAL CLASSES