



INDIAN SCHOOL MUSCAT
SENIOR SECTION
DEPARTMENT OF PHYSICS
CLASS XII
YEAR PLAN 2020-2021

PHYSICS (Code: 042)

UNIT No.	Unit		Marks
1.	ELECTROSTATICS	Chapter-1:ELECTRIC CHARGES & FIELDS	16
		Chapter-2:ELECTROSTATIC POTENTIAL & CAPACITANCE	
2.	Chapter-3:CURRENT ELECTRICITY		17
3.	Chapter-4:MAGNETIC EFFECTS OF CURRENT		
	Chapter-5:MAGNETISM AND MATTER		
4.	Chapter-6:ELECTROMAGNETIC INDUCTION Chapter-7:ALTERNATING CURRENT		
5.	Chapter-8:ELECTROMAGNETIC WAVES		18
6.	Chapter-9:RAY OPTICS AND OPTICAL INSTRUMENTS		
	Chapter-10:WAVE OPTICS		
7.	Chapter-11:DUAL NATURE OF RADIATION AND MATTER		12
8.	Chapter-12:ATOMS		
	Chapter-13:NUCELI		
9.	Chapter-14:ELECTRONIC DEVICES		07
	TOTAL		70

MONTH	UNIT	No of Periods
March 2020	ELECTROSTATICS Electric charges and fields -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. Electrostatic Potential and Capacitance -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.	20
April 2020	Dielectrics and electric polarisation, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a	19

	<p>parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor.</p> <p>CURRENT ELECTRICITY</p> <p>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), electrical energy and power, electrical resistivity and conductivity, temperature dependence of resistance.</p>	
May 2020	<p>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, Wheatstone bridge, metre bridge(qualitative ideas only) Potentiometer - principle and its applications to measure potential difference and for comparing EMF of two cells; measurement of internal resistance of a cell(qualitative ideas only)</p>	15
June 2020	<p>PERIODIC ASSESSMENT-1 MAGNETIC EFFECTS OF CURRENT</p> <p>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 (only qualitative treatment), force on a moving charge in uniform magnetic and electric fields</p> <p>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>MAGNETISM AND MATTER</p> <p>1. Current loop as a magnetic dipole and its magnetic dipolemoment, magnetic dipolemoment of a revolving electron, bar magnet as an equivalent solenoid, magnetic field lines</p>	9
July 2020	<p>PERIODIC ASSESSMENT-2</p> <p>2. Earth's magnetism and magnetic elements</p> <p>ELECTROMAGNETIC INDUCTION</p> <p>1. Electromagnetic induction; Faraday's laws, induced EMF and current 2. Lenz's Law, Eddy currents. 3. Self Induction and Mutual induction 4. AC generator</p> <p>ALTERNATING CURRENT</p> <p>Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LC oscillations (qualitative treatment only), LCR series circuit, resonance Power in an ac circuit Transformer</p>	

August 2020	<p>ELECTROMAGNETIC WAVES</p> <p>Electromagnetic waves, their characteristics, their Transverse nature (qualitative ideas only). Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.</p> <p>RAY OPTICS AND OPTICAL INSTRUMENTS</p> <p>Refraction of light, total internal reflection and its applications, optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lens maker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction of light through a prism</p> <p>4. Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.</p>	11
September 2020	<p>HALF YEARLY EXAM</p> <p>WAVE OPTICS</p> <p>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, coherent sources and sustained interference of light, diffraction due to a single slit, width of central maximum.</p>	14
October 2020	<p>DUAL NATURE OF MATTER</p> <p>1. Photoelectric effect, Hertz and Lenard's observations, Einstein's photoelectric equation, particle nature of light</p> <p>2. Experimental study of photoelectric effect, Matter waves, wave nature of particles, de Broglie Equation</p> <p>ATOMS</p> <p>Alpha scattering experiment, Rutherford's model of atom, Bohr model, Energy levels, Hydrogen spectrum</p> <p>NUCLEI</p> <ol style="list-style-type: none"> 1. Composition and size of nucleus 2. Nuclear force 3. Mass-energy relation, mass defect 4. Nuclear fission and fusion <p>ELECTRONIC DEVICES</p> <ol style="list-style-type: none"> 1. Energy bands in conductors, semiconductors and insulators(qualitative ideas only) 2. Semiconductor diode, I-V characteristics in forward and reverse bias, diode as a rectifier, Optoelectronic devices(LED, photodiode, solar cell) 	20
November 2020	FINAL EXAM	
December 2020	REVISION	

January 2021	FIRST PREBOARD EXAM AISSCE PRACTICAL EXAM	
February 2021	SECOND PREBOARD EXAM	
March 2021		

