

# **KOTHARI INTERNATIONAL SCHOOL**

**GRADE - 12 ANNUAL ACADEMIC PLAN**

**SUBJECT: PHYSICS(042) SESSION: 2022-23**

**NAME OF THE TEACHER SAMTA**

***UNIT 1 (ELECTROSTATICS) + UNIT 2 (CURRENT ELECTRICITY) - 16 MARKS***

***UNIT 3(MAGNETIC EFFECTS OF CURRENT AND MAGNETISM) +UNIT  
4(ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENTS - 17 MARKS***

***UNIT 5(ELECTROMAGNETIC WAVES) + UNIT 6 (OPTICS) - 18 MARKS***

***UNIT 7(DUAL NATURE OF RADIATION AND MATTER) + UNIT 8(ATOMS AND  
NUCLEI) – 12 MARKS***

***UNIT 9(ELECTRONIC DEVICES) – 07 MARKS***

***THEORY – 70 MARKS PRACTICAL – 30 MARKS***

<b>MONTH</b>	<b>TOPIC</b>	<b>CONTENT(SUB-TOPICS)</b>
<b>MARCH (9 DAYS)</b>	<b>Chapter-1:</b> Electric Charges and Fields	Electric Charges; Conservation of charge, Coulomb's law-force between two point charges, forces between multiple charges
<b>APRIL (18 DAYS)</b>	<b>Chapter-1:</b> Electric Charges and Fields  <b>Chapter-2:</b> Electrostatic Potential and Capacitance	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 and uniformly charged thin spherical shell (field inside and outside).  Electric potential, potential difference, electric potential due



<p><b>APRIL -MAY</b> <b>UNIT TEST – 1</b></p> <p><b>(COMMENCING</b> <b>29 APRIL</b> <b>&amp; ENDING 20</b> <b>MAY 2022)</b></p>		<p><b>Syllabus for Unit Test</b></p> <ol style="list-style-type: none"> <li>1. Electric Charges and Fields</li> <li>2. Electrostatic Potential and Capacitance</li> </ol>
<p><b>JUNE</b></p> <p><b>SUMMER</b> <b>VACATION</b></p>		
<p><b>JULY</b> <b>(20 DAYS)</b></p>	<p><b>Chapter-4:</b> Moving Charges and Magnetism</p> <p><b>Chapter-5:</b> Magnetism and Matter</p> <p><b>Chapter-6:</b> Electromagnetic Induction</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, Current loop as a magnetic dipole and its magnetic dipole moment, moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter.</p> <p>Bar magnet, bar magnet as an equivalent solenoid (qualitative treatment only), magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis (qualitative treatment only), torque on a magnetic dipole (bar magnet) in a uniform magnetic field (qualitative treatment only), magnetic field lines. Magnetic properties of materials- Para-, dia- and ferro - magnetic substances with examples, Magnetization of materials, effect of temperature on magnetic properties..</p> <p>Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Self and mutual induction.</p>

<p><b>AUGUST (19 DAYS)</b></p> <p><b>UNIT TEST 2</b></p>	<p><b>Chapter-7:</b> Alternating Current</p> <p><b>Chapter-8:</b> Electromagnetic Waves</p> <p><b>Chapter-9:</b> Ray Optics and Optical Instruments</p>	<p>Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LCR series circuit (phasors only), resonance, power in AC circuits, power factor, wattless current. AC generator, Transformer.</p> <p>Basic idea of displacement current, Electromagnetic waves, their characteristics, their transverse nature (qualitative idea only). Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.</p> <p>Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and optical fibers, 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><b>SEPTEMBER (22 DAYS)</b></p> <p><b>HALF YEARLY EXAMINATION COMMENCES 16 SEPTEMBER &amp; ENDS 28 SEPTEMBER 2022</b></p>	<p><b>REVISION HALF YEARLY EXAMINATION</b></p>	<p><b>SYLLABUS FOR HALF YEARLY EXAMINATION IS 75%</b></p>
<p><b>OCTOBER (13 DAYS)</b></p>	<p><b>Chapter-9:</b> Ray Optics and Optical Instruments</p> <p><b>Chapter-10:</b> Wave Optics</p>	<p>Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers</p> <p>Wave front and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts.</p>

		<p>Proof of laws of reflection and refraction using Huygen's principle. Interference, Young's double slit experiment and expression for fringe width (No derivation final expression only), coherent sources and sustained interference of light, diffraction due to a single slit, width of central maxima (qualitative treatment only).</p>
<p><b>NOVEMBER (21 DAYS)</b></p> <p><b>COMPLETION OF PROJECT</b></p> <p><b>PRE-BOARD EXAMINATION- 1 COMMENCES ON 18 NOVEMBER AND ENDS ON 30 NOVEMBER</b></p>	<p><b>Chapter-11:</b> Dual Nature of Radiation and Matter</p>	<p>Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light. Experimental study of photoelectric effect Matter waves-wave nature of particles, de-Broglie relation.</p> <p><b>SYLLABUS FOR PRE-BOARD EXAMINATION- 1 IS 85%</b></p>
<p><b>DECEMBER (21 DAYS)</b></p> <p><b>PRE-BOARD EXAMINATION- 2 COMMENCES ON 16 DECEMBER AND ENDS ON 30 DECEMBER</b></p>	<p><b>Chapter-12:</b> Atoms</p> <p><b>Chapter-13:</b> Nuclei</p> <p><b>Chapter-14:</b> Semiconductor Electronics: Materials, Devices and Simple Circuits</p>	<p>Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of hydrogen atom, Expression for radius of nth possible orbit, velocity and energy of electron in his orbit, of hydrogen line spectra (qualitative treatment only).</p> <p>Composition and size of nucleus, nuclear force Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission, nuclear fusion.</p> <p>Energy bands in conductors, semiconductors and insulators (qualitative ideas only) Intrinsic and extrinsic semiconductors- p and n type, p-n junction Semiconductor diode - I-V characteristics in forward and</p>

		reverse bias, application of junction diode -diode as a rectifier.  <b>SYLLABUS FOR PRE-BOARD</b>  <b>EXAMINATION- 2 IS 100%</b>
<b>JANUARY (15 DAYS)</b>	<b>PRACTICE TESTS BOARD PRACTICALS COMMENCE</b>	
<b>FEBRUARY (20 DAYS)</b>	<b>BOARD PRACTICALS</b>	
<b>AWAIT CBSE ANNOUNCEMENT OF BOARD EXAMINATION DATES</b>		

**\*\*\*PRACTICAL / PROJECT WORK WILL RUN SIMULTANEOUSLY WITH ACADEMIC TRANSACTION.**