PH-121

PHYSICS- II

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UNIT-I

ELECTROSTATICS
Introduction, Coulomb's law (scalar & vector form), dielectric constant, electric field, electric field due to a point charge, electric dipole and its moment, electric field along the axial and equatorial lines, Gauss's theorem and its applications to find electric field due to charged wire and plane sheet of charge. Conductors, insulators and dielectrics, force and torque experienced by a dipole (in uniform electric field), Electric potential, electric potential energy, potential difference in uniform electric field, electric potential and potential energy due to point charge; capacitance, parallel plate capacitor with air/dielectric medium between plates, series and parallel combinations of capacitors, energy of capacitor. Numerical Problems.   **9Hrs**

CURRENT ELECTRICITY
Introduction, Resistance, resistivity, ohms law, combination of resistances in series and parallel, Kirchhoff's laws, internal resistance of cell (say Volta cell), emf and potential difference, principle of potentiometer and its application for comparing e.m.f. of two cells. Numerical Problems. **5Hrs**

MAGNETISM
Introduction, Magnetic lines of force, magnetic dipole and magnetic moment, magnetic flux, magnetic induction, magnetizing field, intensity of magnetization, magnetic permeability, magnetic susceptibility, concepts and properties of para, dia and ferro-magnetic substances with examples. Numerical Problems.   **5Hrs**

ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENT
Introduction, Faraday's laws of electromagnetic induction, induced e.m.f., Lenz's law, Lorentz magnetic force, self and mutual induction; alternating current & e.m.f., mean and RMS value of AC, elementary idea of working of transformer and losses. Numerical Problems.   **5Hrs**

UNIT-II

THERMAL AND MAGNETIC EFFECTS OF CURRENT
Introduction, Electric energy and power, Joule's law of heating, thermoelectricity (Seeback effect), Biot-Savart's law, magnetic field due to a straight wire, force on conductor carrying current placed in uniform magnetic field, Flemings left hand rule, definition of Ampere, elementary idea of moving coil galvanometer and its conversion into ammeter and voltmeter. Numerical Problems.   **6Hrs**

MOMENT OF INERTIA
Introduction, Center of mass, rigid body, moment of inertia, radius of gyration, theorem of parallel and perpendicular axes, moment of inertia of straight rod, circular ring, circular disc; rotational K.E.; relation between torque and moment of inertia, Kinetic energy and angular momentum, angular momentum and moment of inertia. Numerical Problems.   **5Hrs**

WAVE OPTICS
Introduction, Wave front; spherical, cylindrical and plane wave fronts, Huygen's principle and its application to laws of reflection and refraction of light; interference of light, Young's double slit experiment, coherent source of light, diffraction of light, diffraction due to a single slit; polarization of light (general idea), polarizer and analyzer. Numerical Problems.   **7Hrs**

RAY OPTICS AND OPTICAL INSTRUMENTS
Introduction, Lens, lens formula, total internal reflection of light and its application in optical communication (elementary idea), magnifying power, simple microscope, astronomical and Galileo's telescope. Numerical Problems.   **6Hrs**

                                                                        Total: 48 Hrs.

Recommended Books:

Author	Title	Publisher
1.	Physics for XII	NCERT New Delhi
2. Haliday and Resnick and Walker	Fundamental of Physics	John Wiley & Sons
3. K L Gomber and K L Gogia	Fundamental Physics Class (XII)	Pardeep Publications
4. S. K. Gupta	abc of Physics, Class (XII)	Modern Publications

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PH-121   PHYSICS- II (Practical)

List of Experiments

1. To draw magnetic field lines of a bar magnet placed in magnetic meridian with north pole towards the south of earth and locate the position of the neutral points.

2. To measure the value of resistance by using multi-meter and to compare with those written in color code.

3. To establish the current- voltage relationship and to verify Ohm's law by using an ammeter and voltmeter; and find the value of resistance.

4.
    a) To study the laws of combination of series and parallel for resistances by using a meter bridge.
    b) To find an unknown resistance using meter bridge.

5. To determine the resistance of a galvanometer by half deflection method and find its figure of merit.

6. To determine the focal length of a concave lens by a telescope using the relation:

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

7. To find the angle of prism and refractive index of prism by using prism spectrometer.

8. To study the transverse nature of light.

9. To study the Seebeck effect and to plot a graph between thermoelectric current and temperature of hot junction of copper-constantan thermocouple.

10. To determine the frequency of AC by electrically maintained tuning fork (Melde's method)

11. To find the height of an accessible object using Sextant.

12. To find the moment of inertia and torque of given Flywheel.

13. To determine the magnifying power of telescope.

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