PHYSICS : STANDARD XII
2020-21

Area/ Unit/ Lesson	Competency statements After studying the content in textbook students would be able to....
Unit I Rotational Motion and Mechanical Properties of fluids	• Distinguish between centrifugal and centripetal forces. • Visualize the concepts of moment of inertia of an object. • Relate moment of inertia of a body with its angular momentum. • Differentiate between translational and rotational motions of rolling objects. • Relate the pressure of a fluid to the depth below its surface. • Explain the measurement of atmospheric pressure by using a barometer. • Use Pascal's law to explain the working of a hydraulic lift and hydraulic brakes. • Relate the surface energy of a fluid with its surface tension. • Distinguish between fluids which show capillary rise and fall. • Identify processes in daily life where surface tension plays a major role. • Explain the role of viscosity in everyday life. • Differentiate between streamline flow and turbulent flow.
Unit II Kinetic theory and Thermodynamics	• Relate various gas laws to form ideal gas equation. • Distinguish between ideal gas and a real gas. • Visualise mean free path as a function of various parameters. • Obtain degrees of freedom of a diatomic molecule. • Apply law of equipartition of energy to monatomic and diatomic molecules. • Compare emission of thermal radiation from a body with black body radiation. • Apply Stefan's law of radiation to hot bodies. • Identify thermodynamic process in everyday life. • Relate mechanical work and thermodynamic work. • Differentiate between different types of thermodynamic processes. • Explain the working of heat engine, refrigerator and air conditioner.
Unit III Oscillations and waveS	• Identify periodic motion and simple harmonic motion. • Obtain the laws of motion for simple pendulum. • Visualize damped oscillations. • Apply wave theory to understand the phenomena of reflection, refraction, interference and diffraction. • Visualize polarized and unpolarized light. • Apply concepts of diffraction to calculate the resolving power. • Distinguish between the stationary waves in pipes with open and closed ends. • Verify laws of vibrating string using a sonometer. • Explain the physics involved in musical instruments.
Unit IV Electrostatics and electric current	• Use Gaus's law to obtain the electric field for a charge distribution. • Relate potential energy to work done to establish a charge distribution. • Determine the electrostatic potential for a given charge distribution. • Distinguish between conductors and insulators. • Visualize polarization of dielectrics. • Categorize dielectrics based on molecular properties. • Know the effect of dielectric material used between the plates of a capacitor on its capacitance. • Apply Kirchhoff's laws to determine the current in different branches of a circuit. • Find the value of an unknown resistance by using a meter bridge. • Find the emf and internal resistance of a cell using potentiometer. • Convert galvanometer into voltmeter and ammeter by using a suitable resistor.

Unit V Magnetism	• Realize that Lorentz force law is the basis for defining unit of magnetic field. • Visualize cyclotron motion of a charged particle in a magnetic field. • Analyze and calculate magnetic force on a straight and arbitrarily shaped current carrying wires and a closed wire circuit. • Apply the Biot-Savart law to calculate the magnetic field produced by various distributions of currents. • Use Ampere's law to get magnetic fields produced by a current distribution. • Compare gravitational, magnetic and electrostatic potentials. • Distinguish between paramagnitic, diamagnetic and ferromagnetic materials. • Relate the concept of flux to experiments of Faraday and Henry. • Relate Lenz's law to the conservation of energy. • Visualize the concept of eddy currents. • Determine the mutual inductance of a given pair of coils. • Apply laws of induction to explain the working of a generator. • Establish a relation between the power dissipated by an AC current in a resistor and the value of the rms current. • Visualize the concept of phases to represent AC current. • Explain the passage of AC current through circuits having resistors, capacitors and inductors. • Explain the concept of resonance in LCR circuits.
Unit VI Modern Physics	• Establish validity of particle nature of light from experimental results. • Determine the necessary wavelength range of radiation to obtain photocurrent from given metals. • Visualize the dual nature of matter and dual nature of light. • Apply the wave nature of electrons to illustrate how better resolution can be obtained with an electron microscope. • Check the correctness of different atomic models by comparing results of various experiments. • Identify the constituents of atomic nuclei. • Differentiate between electromagnetic and atomic forces. • Obtain the age of a radioactive sample from its activity. • Judge the importance of nuclear power. • Explain use of p-n junction diode as a rectifier. • Find applications of special purpose diodes for everyday use. • Explain working of solar cell, LED and photodiode. • Relate the p-n junction diode and special purpose diodes. • Realize transistor as an important building block of electronic circuits, analyze situations in which transistor can be used.

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