

# PHYSICS

CODE-19

## PAPER-I

### MECHANICS, THERMAL PHYSICS, WAVES AND OSCILLATIONS

Mechanics :- Galilean, Transformation, concept of mass and Newton's Laws of motion, conservation laws, Motion of rigid bodies; Coriolis Force, Keple's laws of gravitation, measurement of artificial satellites, Fluid motion, Bernoulis theorem circulation, Reynold number, turbulence. Viscosity, surface tension elasticity, Relativistics mechanics and simple applications elements of general relativity.

Thermal Physics :- Perfect Gas, Vander Weals equation. Laws of thermodynamics, Production and measurement of low temperatures. Kinetic theory of Gases, Brownian motion. Black body radianic. Fermi Direc and Bose. Einstein distribution laws. Thermalionization, Elements of irreversible thermodynamics. Solar energy and its utilization.

Waves and Oscillations :- Oscillations with one and two degrees of freedom ; forced vibrations and resonance wave motion. Phase and group velocity.

Hwghens Principle :- Reflection, refraction, interference, diffraction and polarization of waves, optical instruments and resolving power, multiple beam interference. Ex. M. Wave equation . Freshles formula. normal and anomalous dispersion Coherence, Laser and its application.

## PAPER-II

### ELECTRICITY, MAGNETISM ATOMIC PHYSICS AND ELECTRONICS ELECTRICITY AND MAGNETISM

Poisson's and Laplace's and simple applications. Dielectric and Polarization. Capacitors. Dia para and ferro magnetic materials. Kirchhoff's laws, Amper's law, Faraday's Laws of electromagnetic induction, L.C.R. circuits alternating current. Maxwell equations. Atomic Physics :- Bohar's theory, Electron spin, Lande's factor, Pauli's principle Spectre of one electron sysetms, Zeemen effect. Photo-electric effect Elements of X-ray spectra. Compton scattering. Wave particle duality. Schredinyer's equation and simple applications. Uncertainty Principle.

Basic Properties and structure and nuclei mass spectrometry radio activity, mechanism band and decay, Properties of neutrons, Electron, microscope, nuclear fission and reactors, nuclear fusion, cosmicray showers, pair production. "Simple properties of elementary particle". Symetry in physical laws.

Electronics :- Electron emission from solids, Child-Langmuir law, Static and dynamic characteristics of diodes. triodes, tetrodes and pentodes, thyration. Band structure of metals and semi conductor, doped semiconductor, p.n. diodes. transistors.

Simple (Vaccum tubes and transistor circuistry for rectification amplification, oscillation, modulation and detection of r.f. waves. Basic principle of radio reception and transmission. Television, Elementary Principles of microscope solid state device.)

\*\* Plank's law. Specific heat of gases and solids, Thermionic emission.

