SUBJECT : PHYSICS

1.   **Mechanics:** Units and dimensions, S.l. units Motion in one and two dimensions, Newton's laws of Motion with applications variable mass systems, Frictional forces, Work, power, and Energy, Conservative and non-conservative systems. Collisions, Conservation of energy, Linear and angular momenta, Rotational Kinematics, Rotational Dynamics, Equilibrium of rigid bodies, Gravitation, Planetary motion. Artificial Satellites, Surface tension and Viscosity , Fluid dynamics, streamline and turbulent motion. Bernoulli's equation with applications stocke's law and its application. Special theory of relativity Lorentz Transformation, Mass Energy equivalence.

2.   **Waves and oscillation :** Simple harmonic motion, Travelling and Stationary waves, Superposition of waves, .Forced oscillations, Damped oscillations, Resonance, Sound waves Vibrations of air columns, strings and rods, Ultrasonic waves and their application, Doppler effect.

3.   **Optics :** Matrix methods in paraxial optics, Thin lens formulae, Nodal planes, Systems of two thin lenses, Chromatic and Spherical averration, optical instruments, Eyepieces, Nature and propagation of light, Interference, Division of wavefront, Division of amplitude, Simple interferometers, Diffraction- Fraunhoffer and fresnel, Gratings, Resolving power of optical instruments, Rayleigh Criterion, Polarization, Production and detection of polarized light, Rayleigh scattering, Raman scattering, lasers and their applications.

4.   **Thermal Physics :** Thermometry, laws of thermodynamics, Heat engines, Entrophy Thermodynamic potentials and Maxwel's relations, Van derwaals equation of State, Critical constants, Joule-Thomson effect, phase transition Transport phenomenon, heat conduction and specific heat in solids, kinetic theory of gases Ideal Gas equation, Maxwell's velocity distribution, Equipartition of energy, Mean free path, Brownian Motion, Black -hour relation, planck's law.

5.   **Electricity and Magnetism :** Electric charge fields and potentials, Coulumb's law, Gauss .law Capacitance, Dielectrics, Ohm's law, kirchoff's laws, magnetic field, Ampere's law, Faraday's law of Electromagnetic Induction, Lenz's Law Alternating Currents, LCR Circuits, Series & Parallel resonance, Q-factor Thermoelectric efforts and their applications, Electromagnetic Waves, Motion of charged particle in electric and magnetic fields, particle accelerators, vae de Graff generator, Cyclotron Betatron, Mass spectometer, Hall effect, Dia Para and fenno magnetism.

6.   **Modern Physics :** Bohr's theory of Hydrogen atom ;Optical and X-ray spectra, Photo electric effect, Compton effect, Wave nature of matter and . Wave particle quality, Natural and artificial radio-activity, alpha, beta and gamma radiation, chain decay, nuclear fission and fusion, Elementary Particles and their classification.

7.   **Electronics :** Vacuum tubes-diode and triode , p and n type materials , p-n diodes and transistors, Circuits for rectification, amplification and oscillations, Logic gates.