

## पा म (SYLLABUS)

### 1. विान (Science): (Compirising Physics and Chemistry)

#### (A) PHYSICS

Unit and dimensions, dimensional analysis, S.I. Units, Motion in two dimensions Cases

of uniform

velocity and uniform acceleration, General relation among position and velocity,

Uniform circular motion Force and inertia, Newton's Laws of motion, Conservation of momentum and

energy, Static

and kinetic friction, Work energy and power Elastic collisions, Potential energy,

Gravitational Potential energy and its angular conversion to kinetic energy, Potential energy of a

spring, Rigid

body rotation and conservation of its momentum, Moment of inertia, theorems of parallel

and perpendicular axis, (Moment of inertia of uniform ring, disc, thin rod and cylinder only).

Acceleration due to gravity and its variation, Universal law of gravitation, geostationary satellites,

escape velocity.

Hooke's law, Young's modulus, shear and bulk modulus, surface energy and surface

tension, kinetic

theory of gases, gas laws, kinetic energy and temperature.

Specific heats at constant volume and constant pressure, mechanical equivalent of heat,

isothermal

and adiabatic processes.

Heat conduction in one dimension, convection and radiation, Stefan's Law and Newton's

law of

cooling.

Periodic motion, Simple harmonic motion, Oscillations due to spring, Wave motion,

principle of

superposition, Progressive and stationary waves, beats and Doppler effect.

Wave nature of light, Interference, Young's double slit experiment, Velocity of light and

Doppler's

effect in light.

Reflection, refraction, total internal reflection, curved mirrors, Lenses, mirror and

lens formulae.

Electrostatic potential, capacitance, parallel plate and spherical capacitors capacitors in series and parallel, energy of a capacitor.

Electric current, Ohm's law, Kirchhoffs laws, resistances in series and parallel temperature dependence of resistance, Wheatstone bridge, potentiometer.

Measurement of voltages as currents.

Electric power, heating effects of currents, chemical effects and law of electrolysis thermoelectricity, Biot Savart law, Magnetic fields due to a straight wire circular loop and solenoid.

Force on a moving charge in a magnetic field (Lorentz force), magnetic moment of a current loop, effect of a uniform magnetic field of a current loop, forces between two currents, moving coil, galvanometer, ammeter and voltmeter.

Electromagnetic induction induced emf, Faradays law, Lenz's law, self and mutual inductance alternating currents, impedance and reactance, growth and decay of current in L-R circuit, elementary idea of dynamo and transformer.