



# PHYSICS

## (Medicine and Pharmacy)

**Physical quantities and their units**, vectors and scalars, SI units, derived units, prefixes of units and conversions.

**Speed, distance, velocity and displacement.** Uniform motion. Uniformly accelerated motion. Force, Newton's laws, gravitational field, projectile problems, Kepler's laws. Equilibrium under forces. Work, energy, power, simple machines and efficiency. Impulse and momentum. Angular motion in a plane. Rigid body rotation. Density and elasticity, modulus. Fluids at rest and in motion, pressure, Pascal's principle, Archimedes' principle, Bernoulli's equation. Thermal expansion.

**Simple harmonic motion and springs.** Wave motion, propagating wave equation, interference. Sound, Doppler effect.

**Ideal gases, gas-law problems.** Kinetic theory. Heat quantities, calorimetry problems, humidity. Thermal energy, change of state. Heat, internal energy. First and second law of thermodynamics.

**Electric field, Coulomb's law, charge.** Electric potential, capacitors. Current, resistance, Ohm's law. Electrical work and power. Simple circuits. Kirchhoff's laws.

**Magnetic fields – forces and sources.** Charge in a motion. Magnetic effects of matter, magnetic flux, Faraday's law for induced EMF, Lenz's law. Inductance, stored energy. Alternating current, meters, impedance, transformer.

**Reflection of light, mirrors.** Refraction of light, Snell's law. Thin lenses, object and image relation, lens-maker's equation. Optical instruments – the eye, magnifying glass, microscope, telescope, eyeglasses. Interference and diffraction of light.

**Quantum physics, wave mechanics, photoelectric effect, momentum of a photon.** Hydrogen atom, energy-level diagrams, spectral lines. Multielectron atoms, quantum numbers, Pauli exclusion principle. Nuclear physics – atomic nucleus, atomic mass unit, binding energy, radioactivity, fission and fusion reaction, dose.

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