

TOPICS ON PHYSICS FOR ADMISSION TEST

MECHANICS

Motion in one dimension. Displacement, velocity, acceleration, motion diagram, freely falling objects.

Vectors and two dimensional motion. Displacement, velocity, acceleration in two dimensions.

The laws of motion. Forces, Newton's first, second and third law. Forces of friction.

Energy. Work. Power. Kinetic energy - work energy theorem. Systems and energy conservation. Kinetic, gravitational potential and spring potential energy.

Momentum and collision, conservation of momentum.

Rotational motion and the law of gravity.

Rotational equilibrium and rotational dynamics. Torque and the conditions for equilibrium.

Solids and fluids. States of matter. Density and pressure. Archimedes principle.

THERMODYNAMICS

Temperature and the Zeroth law of thermodynamics. The kinetic theory of gases. Thermal expansion of solids and liquids.

Energy in thermal processes. Heat and internal energy, specific heat.

The Laws of thermodynamics. Entropy.

VIBRATIONS AND WAVES

Hooke's law. Elastic potential energy. Simple harmonic motion. Motion of a pendulum.

Waves and interference of waves. Frequency, amplitude and wavelength.

Sound. Characteristics of sound waves. Doppler effect.

ELECTRICITY AND MAGNETISM

Electric forces and electric field. Electric charges. Insulators and conductors. Coulomb's law.

Electrical energy and capacitance. The parallel plate capacitor.

Current and resistance. Ohm's law. Temperature variation of resistance.

Direct current circuits. Resistors in parallel and series. Kirchoff's laws. RC circuits.

Magnetism. Magnetic fields. Motion of charged particles in magnetic field.

Induced voltage and inductances. Faraday's law of induction.

Alternating current. Resistors and capacitors in AC circuits.

LIGHT AND OPTICS

The nature of light. Reflection, refraction. Total internal reflection.

Polarization of light waves.

Mirrors and lenses. Image formation of flat mirror and thin lenses.

MODERN PHYSICS

The speed of light.

Einstein's principle of relativity.

Atomic spectra, the exclusion principle and the periodic table.

Binding energy, radioactivity.

Nuclear fusion and fission.

Elementary particles and fundamental forces.

Textbook: Raymond A. Serway, Jerry S. Faughn, Chris Vuille: *College Physics, 9th Edition*. Brooks/Cole, Cengage Learning, 2012