

Content of the questions on Physics

PHYSICS (last two years of high school)

1. Movements and Forces.

Reference system. Variables. Velocity. Acceleration.

Rectilinear and circular movements.

Newton's laws of motion.

Momentum conservation principle

Force and movement. Mechanical impulse.

Gravitational forces, friction and displacement, and elastic forces.

2. Energy and Energy Transfer: Work and Heat.

Work. Kinetic energy, potential gravitational energy, potential elastic energy.

Relationship between work and energy. Conservative forces. Potential gravitational energy near the Earth's surface.

Conservation of energy principle. Degradation of energy.

Power.

Energy and heat. Principles of thermodynamics.

3. Electricity. Electromagnetic Interaction.

Electrostatic interaction. Coulomb's law. Electric field. Electric potential energy.

Electric potential. Equipotential surfaces. Conductor capacity. Capacitors.

Electric field. Magnitudes: intensity and potential. Relationship between electric field and electric potential.

Relationship between electric phenomena and magnetic phenomena. Creation of magnetic fields by moving charges. Forces on moving charges in magnetic fields: the Lorentz force.

4. Vibrations and Waves.

Oscillation motion. Simple harmonic motion.

Wave motion. Wave magnitudes and characteristics.

Huygens-Fresnel principle. Reflection and refraction. Standing waves and sound waves.

5. Optics.

The speed of light depends on the medium and phenomena produced by a medium change: reflection, refraction.

Geometric optics in thin lenses.

Qualitative study of the visible spectrum.

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