

EMOe - written examination
List of topics

1. **Electric field** (Coulomb's law, field intensity, potential energy and potential, Gauss law, capacitance, capacitors in parallel and in series, energy of electric field) **and Stationary current** (Ohm's law, Kirchhoff's circuit laws, work, energy and power).
2. **Magnetic field** (Lorentz force, charged particle motion, magnetic force on a wire, torque on a current loop, Ampere's law, Biot-Savart law, Faraday's law, self-induction and mutual induction, energy of magnetic field) **and Maxwell's equations** (Electromagnetic waves, energy transfer, intensity).
3. **Geometrical optics** (Snell's law, planar and spherical mirrors, thin lenses, simple optical instruments) **and physical optics** (interference of light, diffraction of light, polarization of light).
4. **Introduction to Quantum physics** (photons and elementary particles, momentum and energy, radiation laws, photoelectric effect, Bohr model, wave nature of particles, hydrogen atom, emission spectra of hydrogen, electron configuration) **and Introduction to solid state physics** (solid state structure, bonding in solids, electron band structure, band width, conductivity, LED principle).