

Electromagnetic Induction and the Electric Motor

Chapter 12: Magnetic Effects of Electric Current · Topic 2

Key Concept

In a generator, mechanical energy (like a turbine spun by water, wind, or steam) rotates a coil within a magnetic field, continuously changing the magnetic flux through the coil and inducing an alternating current. In a motor, current flowing through a coil placed in a magnetic field experiences a force (following the left-hand rule for motors), causing the coil to rotate — this principle powers countless devices, from electric fans and washing machines to electric vehicles.

Quick Revision Notes

- Electromagnetic induction: a changing magnetic field induces current (discovered by Faraday).
- Generators use electromagnetic induction to convert mechanical energy into electrical energy.
- Motors work oppositely — converting electrical energy into mechanical energy via force on a current-carrying coil.
- The left-hand rule determines the direction of force in a motor's coil.

Practice Questions

- 1 State one difference between an electric motor and an electric generator.
- 2 Explain how a generator produces electric current from mechanical motion.
- 3 Name two devices that use an electric motor.