

29 Lecture - PHY101

Important Subjective

1. What is the magnetic field?

The magnetic field is a region in space around a magnet or a current-carrying conductor where the magnetic force can be detected. It is a vector field that exerts a force on moving charged particles.

2. What is a magnetic field line?

Magnetic field lines are the paths that a hypothetical magnetic north pole would follow if it were placed in a magnetic field. The direction of the magnetic field is tangent to the field line at any point.

3. What is the right-hand rule in magnetism?

The right-hand rule is a mnemonic used to determine the direction of the magnetic force on a moving charged particle or a current-carrying conductor in a magnetic field. If you point your right thumb in the direction of the particle's velocity or current, and your fingers in the direction of the magnetic field, then your palm points in the direction of the magnetic force.

4. What is the magnetic field inside a solenoid?

The magnetic field inside a solenoid is uniform and parallel to the axis of the solenoid. The strength of the magnetic field is proportional to the number of turns per unit length of the solenoid and the current flowing through it.

5. What is the difference between diamagnetic, paramagnetic, and ferromagnetic materials?

Diamagnetic materials are those that have no permanent magnetic moment and are slightly repelled by a magnetic field. Paramagnetic materials have a small, positive magnetic susceptibility and are weakly attracted by a magnetic field. Ferromagnetic materials have a large, positive magnetic susceptibility and can be magnetized, retaining their magnetization even when the external magnetic field is removed.

6. What is the Hall effect?

The Hall effect is a phenomenon in which a magnetic field perpendicular to a current-carrying conductor creates a transverse electric field, resulting in a voltage across the conductor perpendicular to both the current and the magnetic field. This effect is used in Hall effect sensors to measure magnetic fields.

7. What is Lenz's law?

Lenz's law states that the direction of an induced electromotive force (EMF) in a conductor is always such that it opposes the change in magnetic flux that produced it. This law is based on the principle of conservation of energy.

8. What is electromagnetic induction?

Electromagnetic induction is the process of generating an electromotive force (EMF) in a conductor by exposing it to a changing magnetic field. This effect is the basis of many electrical devices, such as generators and transformers.

9. What is the difference between AC and DC?

AC stands for alternating current, which periodically reverses direction and changes magnitude. DC stands for direct current, which flows in one direction and maintains a constant magnitude. AC is used for long-distance power transmission, while DC is used for electronic devices and batteries.

10. What is an electromagnet?

An electromagnet is a magnet created by running an electric current through a coil of wire wrapped around a magnetic core. The strength of the magnetic field generated by an electromagnet can be controlled by adjusting the current flowing through the coil. Electromagnets are used in a variety of applications, such as in electric motors, speakers, and MRI machines.