

Module 07 Baseline Quiz

Read sections 11.1 - 11.7

1. What is the SI unit for magnetic field?
 - a) Telsa
 - b) Torr
 - c) Henry
 - d) Farad
 - e) None of the above.
2. How does the magnetic force differ from the electric force?
 - a) The force does not depend on the sign of the charge.
 - b) The force does not depend on the magnitude of the charge.
 - c) The force is always perpendicular to the field.
 - d) The force is always in the opposite direction of the field.
 - e) None of the above.
3. If a proton is moving in the positive y direction and a magnetic field points in the positive z direction, what direction will the proton be accelerated?
 - a) The positive x direction.
 - b) The positive z direction.
 - c) The negative z direction.
 - d) The negative x direction.
 - e) None of the above.
4. If an electron is moving in the positive z direction and a magnetic field points in the positive x direction, what direction will the electron be accelerated?
 - a) Actually, the acceleration it will be zero
 - b) The negative x direction.
 - c) The negative y direction.
 - d) The negative z direction.
 - e) None of the above.

5. What does helical motion refer to?
 - a) The motion of a charged particle traveling through a magnetic field when its velocity is perfectly perpendicular to the magnetic field lines.
 - b) The motion of a charged particle traveling through a magnetic field when its velocity has a parallel component to the magnetic field lines.
 - c) The motion of a charged particle traveling through a magnetic field when its velocity is perfectly parallel to the magnetic field lines.
 - d) The motion of a charged particle traveling through a magnetic field when the field intensity is time-varying.
 - e) None of the above.
6. What is the cause of the force exerted on a current-carrying wire by a magnetic field?
 - a) The magnetic force on the individual charges moving in the current.
 - b) The magnetic force on the nuclei of the atoms of the conducting material.
 - c) The magnetic force on the electrons in orbit around atom nuclei of the conducting material.
 - d) The time-dependence of the magnetic field at the position of the wire that carries current.
 - e) None of the above.
7. What is the magnetic dipole moment for a circular loop of current with current I and diameter D ?
 - a) $IA\hat{n}$
 - b) $\frac{1}{4}ID^2\hat{n}$
 - c) $-\frac{1}{4}ID^2\hat{n}$
 - d) $\vec{D} \times \vec{B}$
 - e) None of the above.
8. In which case(s) will a torque be exerted on a magnetic dipole moment?
 - a) When the dipole moment vector points in the same direction as the magnetic field.
 - b) When the dipole moment vector points in the opposite direction of the magnetic field.
 - c) When the dipole moment vector points perpendicular to the direction of the magnetic field.
 - d) When the dipole moment vector points in a direction making a 45 degree angle with the magnetic field.
 - e) None of the above.
9. What is the Hall effect?
 - a) The observation that electrons moving through a conductor can still experience a magnetic force.
 - b) The observation that a magnetic field will exert a force on charges that move through it.
 - c) The observation that a potential difference between the edges of a conducting strip that carries current will form if the strip is placed in a magnetic field.
 - d) None of the above.

10. What is the potential energy of an electric dipole in a magnetic field?

a) $U = -\vec{\mu} \times \vec{B}$

b) $U = \vec{\mu} \times \vec{B}$

c) $U = -\vec{\mu} \cdot \vec{B}$

d) $U = \vec{\mu} \cdot \vec{B}$

e) None of the above.