

1. Magnetic fields cause forces on (choose the most appropriate):
A) moving objects. B) atoms. C) charges. D) other magnetic fields. E) moving charges.

2. Chapter 21, Problem 2a
A) zero newtons
B) 2.3×10^{-4} N, out of the paper
C) 2.3×10^{-4} N, into the paper
D) 5.7×10^{-5} N, out of the paper
E) 5.7×10^{-5} N, into the paper

3. Chapter 21, Problem 2b
A) zero newtons
B) 1.1×10^{-4} N, out of the paper
C) 1.1×10^{-4} N, into the paper
D) 2.3×10^{-4} N, out of the paper
E) 2.3×10^{-4} N, into the paper

4. Chapter 21, Problem 4
A) 1/3 B) $1/\sqrt{3}$ C) $\sqrt{3}$ D) 3 E) 9

5. A proton traveling due east in a region that contains only a magnetic field experiences a vertically *upward force* away from the surface of the earth. What is the direction of the magnetic field?
A) north B) east C) south D) west E) down

6. Chapter 21, Problem 6
A) 2.1×10^{12} m/s² B) 5.9×10^{12} m/s² C) 7.0×10^{12} m/s² D) 8.6×10^{12} m/s² E) zero m/s²

7. An electron is moving with a speed of 3.5×10^5 m/s when it encounters a magnetic field of 0.60 T. The direction of the magnetic field makes an angle of 60.0° with respect to the velocity of the electron. What is the magnitude of the magnetic force on the electron?
A) 4.9×10^{-13} N B) 3.2×10^{-13} N C) 1.7×10^{-13} N D) 3.4×10^{-14} N E) 2.9×10^{-14} N