Part 1:

1. The north pole of a magnet points toward the earth's

a) north pole.

**b) south pole – magnetic which corresponds to the geometric north**

c) center.

d) middle latitudes.

1. The SI unit of magnetic field is the

a) weber.

b) gauss.

c) **tesla**.

d) lorentz.

1. A vertical wire carries a current straight up in a region where the magnetic field vector points due north. What is the direction of the resulting force on this current?

B

a) Down

b) North F I

c) East

**d) West**

1. The direction of the force on a current-carrying wire in a magnetic field is described by which of the following?

a) perpendicular to the current

b) perpendicular to the magnetic field

**c) both a) and b) are valid**

d) neither a) nor b) is valid

1. A thin copper rod 1.0 m long has a mass of 0.050 kg and is in a magnetic field of 0.10 T. What minimum current in the rod is needed in order for the magnetic force to cancel the weight of the rod?

a) 1.2 A

b) 2.5 A

**c) 4.9 A**

d) 9.8 A

1. A **stationary** proton is in a uniform magnetic field of 0.20 T. What is the magnitude of the magnetic force on the proton?

**a) zero**

b) 1.6X10-20 N

c) 3.2X10-20 N

d) 1.6X10-21 N

1. A proton moving at 5.0X104 m/s horizontally enters a region where a magnetic field of 0.12 T is present, directed vertically downward. What force acts on the proton?

a) zero

b) 3.2X10-16 N

c) 6.4X10-16 N

**d) 9.6X10-16 N**

1. At a particular instant, an electron moves eastward at speed V in a uniform magnetic field that is directed straight downward. The magnetic force that acts on it is

a) zero.

b) directed upward.

**c) directed to the south.** \

d) none of the above.

1. At a particular instant, a proton moves eastward at speed V in a uniform magnetic field that is directed straight downward. The magnetic force that acts on it is

a) zero.

b) directed upward.

c) to the south.

**d) none of the above – Should be directed north**

1. An **electron** has an initial velocity to the south but is observed to curve upward as the result of a magnetic field. The direction of the magnetic field is

v

**a) to the west.**

b) to the east.

c) upward.

d) downward. B curve upward

1. A charged particle moves and experiences no magnetic force. From this we can conclude that

a) no magnetic field exists in that region of space.

b) the particle is moving parallel to the magnetic field.

c) the particle is moving at right angles to the magnetic field.

**d) either no magnetic field exists or the particle is moving parallel to the field.**

1. An electron moves with a speed of 3.0X104 m/s perpendicular to a uniform magnetic field of 0.40 T. What is the magnitude of the magnetic force on the electron?

a) 4.8X10-14 N

**b) 1.9X10-15 N**

c) 2.2X10-24 N

d) zero

1. An electron moving along the +x axis enters a region where there is a uniform magnetic field in the +y direction. What is the direction of the magnetic force on the electron? (+x to right, +y up, and +z out of the page.)

**a)up FB + Z**

b) down **. . .**

c) left e velocity **+X**

d) right **. . +Y . B**

1. Which of the following is correct?

a) When a current carrying wire is in your right hand, thumb in the direction of the magnetic field lines, your fingers point in the direction of the current.

b) When a current carrying wire is in your left hand, thumb in the direction of the magnetic field lines, your fingers point in the direction of the current.

**c) When a current carrying wire is in your right hand, thumb in direction of the current, your fingers point in the direction of the magnetic field lines.**

d) When a current carrying wire is in your left hand, thumb pointing in the direction of the current, your fingers point in the direction of the magnetic field lines.

Magnetism II Questions

1. How much current must flow for 1.0X10-3 T of magnetic field to be present 1.0 cm from a wire?
   1. 0.050 A B = o I B 2  r = I ****o=4x10-7 T m / A
   2. 9.2 A 2  r o
   3. 16 A
   4. **50 A**
2. A high power line carrying 1000 A generates what magnetic field at the ground, 10 m away?
   1. 4.7X10-6 T B = o I
   2. 6.4X10-6 T 2  r
   3. **2.0X10-5 T**
   4. 5.6X10-5 T
3. A long straight wire carries current toward the east. A proton moves toward the east alongside and just south of the wire. What is the direction of the force on the proton?
   1. north
   2. south
   3. **up x x x**
   4. down

x x x

1. Two long parallel wires placed side-by-side on a horizontal table carry identical size currents in opposite directions. The wire on your right carries current toward you, and the wire on your left carries current away from you. From your point of view, the magnetic field at the point exactly midway between the two wires
   1. points up. left current **x** right current
   2. **points down.**
   3. points toward you. B
   4. is zero.
2. Two long parallel wires placed side-by-side on a horizontal table carry identical current straight toward you. From your point of view, the magnetic field at the point exactly between the two wires
   1. points up.
   2. points down.
   3. points toward you.
   4. **is zero**
3. A horizontal wire carries a current straight toward you. From your point of view, the magnetic field caused by this current
   1. points directly away from you.
   2. points to the left.
   3. circles the wire in a clockwise direction.
   4. **circles the wire in a counter-clockwise direction.**
4. A vertical wire carries a current straight down. To the east of this wire, the magnetic field points
   1. north.
   2. east.
   3. **south.**  **x**
   4. down.
5. A current carrying loop of wire lies flat on a table top. When viewed from above, the current moves around the loop in a counterclockwise sense. What is the direction of the magnetic field caused by this current, outside the loop? The magnetic field
   1. circles the loop in a clockwise direction.
   2. circles the loop in a counterclockwise direction.
   3. points straight up.
   4. **points straight down.**