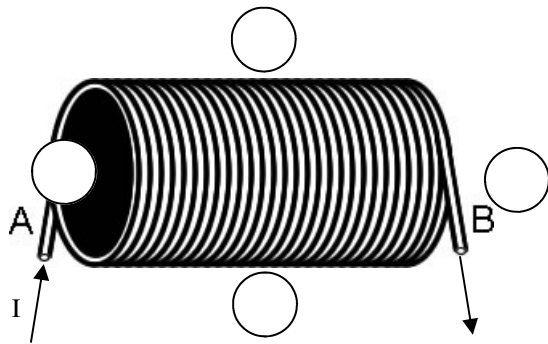
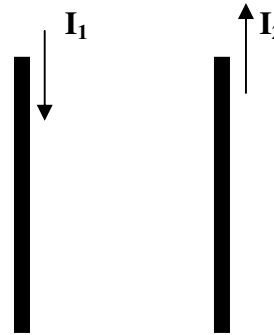


# 2011-12 Magnetism 3



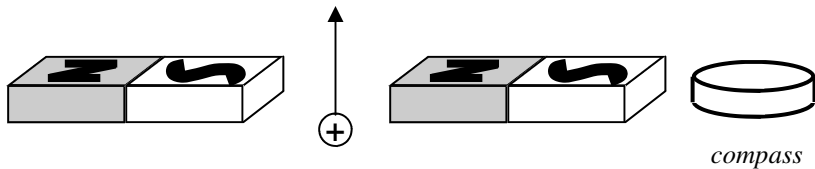
1. Current goes into side A of the solenoid. (Again, think of water flowing thru tubes. Your right fingers are the water.)
  - A. Which side of the solenoid is its north pole?
  - B. Draw the arrows for the compasses.

2.
  - A. \* Draw B (the magnetic field) for wire 1 on the right side of wire 1
  - B. Draw B for wire 2 on the left side of wire 2.
  - C. In between the two wires are the two magnetic fields going the same direction or opposite directions?
  - D. Will the wires be attracted or repelled by each other?



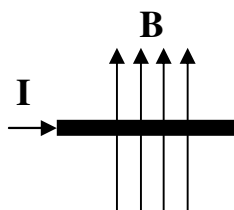
3. Fingers, Thumb, or Palm? (Using "Magnetic Force" notes for the Right Hand Rule):

- |   |  |
|---|--|
| A. ___ * The direction of a moving charge.    | E. ___ Direction of the current in a wire.                 |
| B. ___ * The direction of the magnetic force. | F. ___ Direction a wire moves because of a magnetic field. |
| C. ___ The direction of a moving proton.      |  |
| D. ___ Points from a N pole to a S pole.      |  |

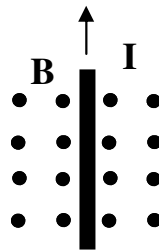


4. A proton is moving between two bar magnets.
  - A. \* Draw the direction of the magnetic field between the magnets (label it "B").
  - B. \* Find the direction of the force on the proton.
  - C. Fill in the compass.

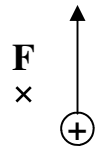
5. \* The direction of the magnetic field and current are shown. Which is the direction of the magnetic force on the wire?



6. \* Find the direction of the magnetic force on the wire.

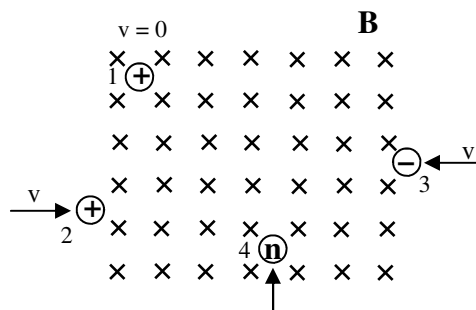


7. A proton moves as shown. Given the direction of the force, determine the direction of the magnetic field.



8. Four subatomic particles are in a magnetic field. The arrows show the direction of their initial velocities when they enter the field. The charge of each object is also given.

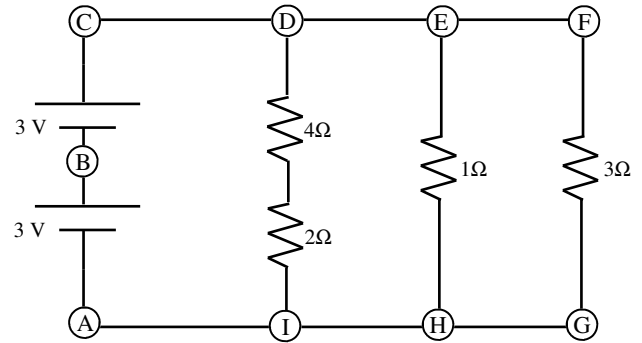
- A. The proton at the top left (object 1) is at rest, what is the direction of the magnetic force ( $F_B$ )?
- B. Draw the path that the moving proton (object 2) at the bottom left will follow.



- C. Draw the path that the electron (object 3) will follow.
- D. What is the change of speed of the electron?
- E. What is the direction of the magnetic force on the neutron (object 4) labeled "n"?

2011 Magnetism 3—p2

9. A. Calculate the total current flowing thru the batteries.
- C. Calculate the power dissipated by the entire circuit.
- D. If the resistors were actually light bulbs, which one would be the brightest and why?
- E. If the  $2\Omega$  resistor was replaced by a  $5\Omega$  resistor,  
 i. how would the current thru the batteries change?  
 ii. how would the current thru the  $3\Omega$  change?
- F. How much voltage is used by the  $4\Omega$ ?



10. Conduction (Cd), Convection (Cv), Radiation (R):

- A. \_\_\_ Between a pot and the stove.  
 B. \_\_\_ Between the pot and the water.  
 C. \_\_\_ Moves heat throughout the water.

- D. \_\_\_ You lift the pot and put your hand next to (but not touching) the side of the pot. You can feel the heat because of this.

1) Right side; 2A) out of page; 3A) T; 3B) P;

4A) N to S, so left 4B) out of page.

5) out of page (fingers point toward top of page; thumb points to R);

6) Right (fingers are out of page; thumb is to top of page)

9A) add up the individual currents. The current in the first branch =  $6V/6\Omega = 1A$ .

9F) use  $V = IR$  for each individual resistor. In this example  $R = 4\Omega$ .