Lab 4: Induction Take Home Report (24 Points)

Part 1: Moving Magnets and Current (2 Points each)

1. When the magnet falls through the loop there are 2 peak voltages in opposite directions. Why? Carefully compare these peak voltages. Are they exactly the same? Why or why not?
2. What relationship exists between the magnet’s speed and the voltage induced in the loop?
3. What is the voltage if you place the magnet at rest in the loop? What does this indicate is necessary in order to get a current from a magnet?

Part 2: Moving Coils and Current (2 Points each)

1. Is it necessary for a magnet to move to get a current from a loop? Why or why not?
2. What is different about the voltage when you bring the loop near one pole of the magnet as opposed to the other pole?
3. What happens when you push one pole of the magnet toward the top of the loop as opposed to when you push the same pole of the magnet toward the bottom of the loop? What does this difference have to do with the magnetic field?

Part 3: Circuits and Current (3 Points each)

1. How is turning the power off different from turning it on?
2. What changes when you reverse the direction of the inductor and turn the power on and off? Why does it change?
3. Why does turning the power on and off produce a current in the pick up coil but there is no current while the power continues to be on?
4. Based on all 3 parts of this lab, what can you say is the one thing that must be changing in order for a current to be produced?