

STE
Solenoid Lab

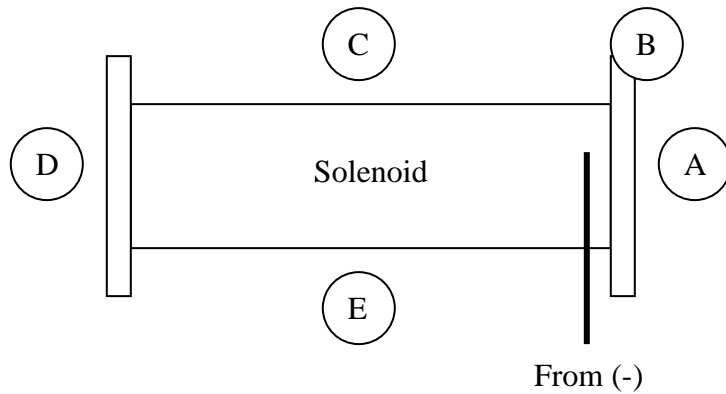
Name _____ /10

Purpose: To examine the magnetic field around an electromagnet.

Materials: power supply, solenoid, two wires, ferromagnetic spatula, compass.

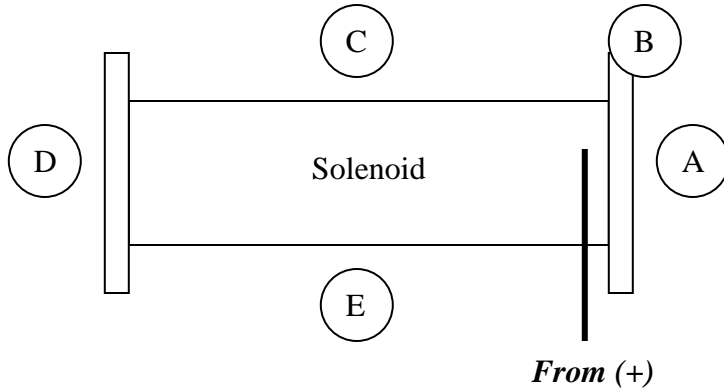
Procedure and Data:

1. Connect one of the solenoid) to the negative terminal of the power supply. Connect the other side to the positive end.
2. Set the voltage at 3.0 V, and turn on the power source.
3. Hold the compass at each position indicated below, and with a drawing of an arrow (inside circle) indicate where the compass was pointing in the data table.



| Position | Compass |
|----------|---------|
| A | ○ |
| B | ○ |
| C | ○ |
| D | ○ |
| E | ○ |

4. Switch the positive and negative around, and repeat steps 1 to 3.



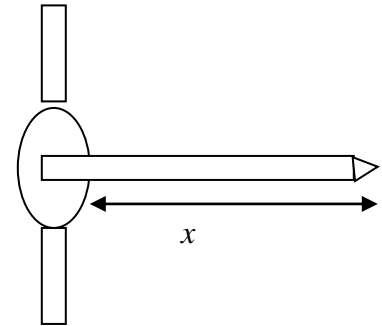
| Position | Compass |
|----------|---------|
| A | |
| B | |
| C | |
| D | |
| E | |

5. Increase the voltage to 10.0 V.

6. Hold the flat part of the spatula just at the edge of the solenoid's core (tunnel). Gradually move it into the core. Measure the greatest distance (shown in the diagram as x) when the spatula gets sucked into the core.

| | |
|--------------|----------------------|
| Distance(cm) | <input type="text"/> |
|--------------|----------------------|

7. What's observed if you lower the voltage to 1.5 V?



Analysis: Draw the solenoid and the surrounding magnetic field based on what you observed.

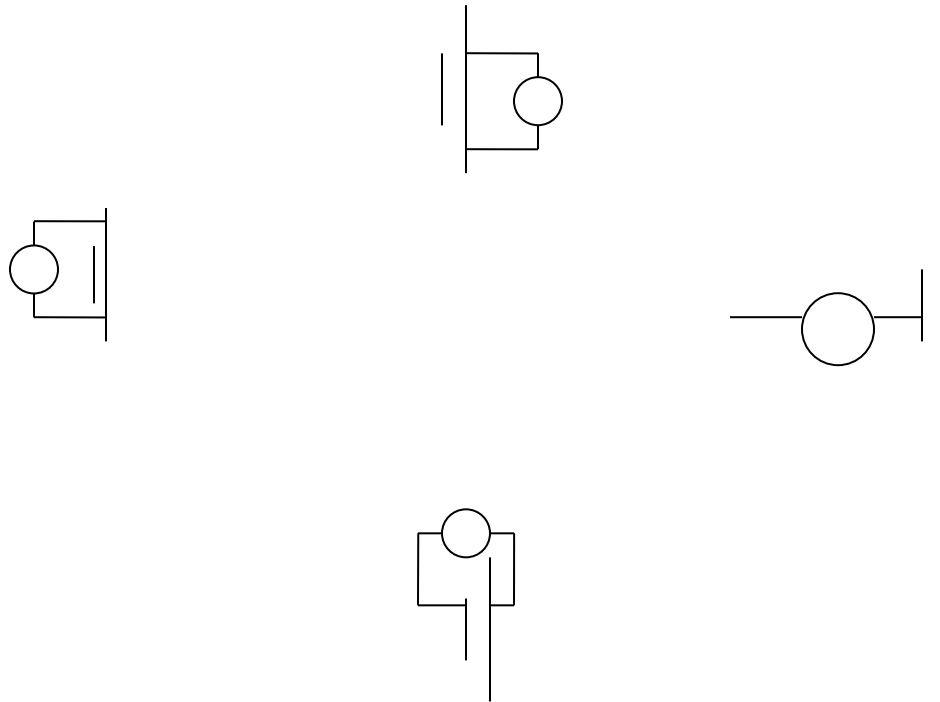
| Part 1 |
|----------------------|
| |

| Part 2 |
|----------------------|
| |

Conclusion:(mention the field and voltage)

1. No matches are available. There is no cobalt chloride paper either. You also have a bad cold, preventing you from smelling any solution. What could you then do to tell water apart from alcohol? What characteristic test can you apply? (2)

2. Which of the following is the correct way to attach a voltmeter to a power supply? (Just circle the correct diagram) (1)



- 3.

What is the percent efficiency of a calorimeter that absorbs 300 J of heat from a 3 V power source delivering 2A of current in 1 minute? Recall that the purpose of a calorimeter is to absorb heat.

(2 marks)