Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class: \_\_\_\_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

**Inductive Reactance**

**Lab Activity # 1 - Show the Effect of Inductance in AC Circuits**

**Tools and Materials**

* Filter choke approximately 2h or larger

|  |  |  |
| --- | --- | --- |
|  75 ohm, 1 watt resistor |  | **R** |
|  | DC and AC milliammeter |  | **S1** |
|  | Multimeter | **VS** | **L** |



* AC and DC power supplies

**Procedure**

1. Connect the 75 ohm resistor and DC ammeter in series with the DC power supply without the inductor (for now).
2. Adjust the voltage until there are 5 volts across the resistor.
3. Record the ammeter indication \_\_\_\_\_\_\_\_\_\_\_\_\_; then compute RDC

(NOTE: RDC = V/I).

1. Connect the 75 ohm resistor and AC ammeter in series with the AC power supply.
2. Adjust the voltage until there are 5 volts across the resistor; then record the current from the ammeter\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and compute RAC (NOTE: RAC = V/I).
3. Compare RDC and RAC and explain differences noted, if any.
4. Connect the filter choke (inductor) and DC ammeter in series with the DC power supply as shown.
5. Adjust the DC power supply until there are 5 volts across the resistor; read the current indication on the ammeter \_\_\_\_\_\_\_\_\_\_ and compute ZL(DC) (NOTE: Z L (DC) = EL/IL.).
6. Repeat Step 8 using the AC ammeter and AC power supply and compute ZL(AC) (NOTE: ZL(AC) = VL/IL).
7. Compare the current recorded in Step 8 with that recorded in Step 9, and explain any differences noted.
8. Use the filter choke value (in henries) and the voltage frequency to compute XL.
9. Compare the computed XL (Step 11) with the DC impedance (Step 8) and with the AC impedance (Step 9).
10. Explain any differences noted.
11. Turn off circuit, disconnect components, and place materials in the proper storage area.