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Experiment #10

Introduction to capacitors and inductors.

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**Experiment #10**

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**Objective**

 The objective of this experiment was to observe the effects of capacitors, resistors and inductors in direct current circuits and alternating current circuits.

**Materials Required.**

* Breadboard
* Digital multimeter
* 10Ω resistor
* 500mH inductor
* 1000µF
* Lamp
* Power supply (DC and AC current)

**Procedure:**

* Wire the circuit on the schematic onto the breadboard using the materials.
* Use the dc power supply as supply then measure the voltages of the components and observe the effects.
* Then use ac power supply as supply then measure the voltages of the components and observe the effects.

**Data.**

*Using the 10Ω resistor.*



|  |  |  |
| --- | --- | --- |
| *Component* | *DC source voltages* | *AC source voltage* |
| Lamp | 7.87V | 8.62V |
| Resistor | 1.72V | 0.78V |

*Using the inductor.*



|  |  |  |
| --- | --- | --- |
| *Component* | *DC source voltages* | *AC source voltages* |
| Lamp | 6.88V | 0.16V |
| Inductor | 2.75V | 10.88V |

*Using the Capacitor*



|  |  |  |
| --- | --- | --- |
| *Component* | *DC source voltages* | *Ac source voltages* |
| Lamp | 0V | 10.36V |
| Capacitor | 10.09V | 0.58V |

***Conclusion***

1. Based on the brightness of the bulb the resistor opposes current flow the same in both AC and DC but based upon the voltages across the resistor and the bulb, the resistor opposes current flow in the DC circuit a little more than in then Ac circuit.
2. Based on both brightness and voltages across the inductor and the bulb, the inductor opposes the flow of current almost totally in the AC circuit and less in the DC circuit. The bulb doesn’t light up in the AC circuit but does in the DC circuit.
3. Based on both brightness and voltages across the capacitor and the bulb, the capacitor opposes the flow of current completely in the DC circuit but incredibly less in the AC circuit. The bulb doesn’t light up in the DC circuit.

***Summary***

 Based on the observations made in circuit with a resistor opposing current flow the current source whether DC or AC current needs to of a high enough magnitude to overcome the resistance value but in a circuit an inductor will pass DC because the current doesn’t fluctuate but will impede AC source because the current fluctuates and also in using a capacitor will not allow DC current through because it charges to the applied voltage of a dc source while due to the nature of an AC source .i.e. the current fluctuates will ensure that current always flows through the capacitor .