ACTIVITY

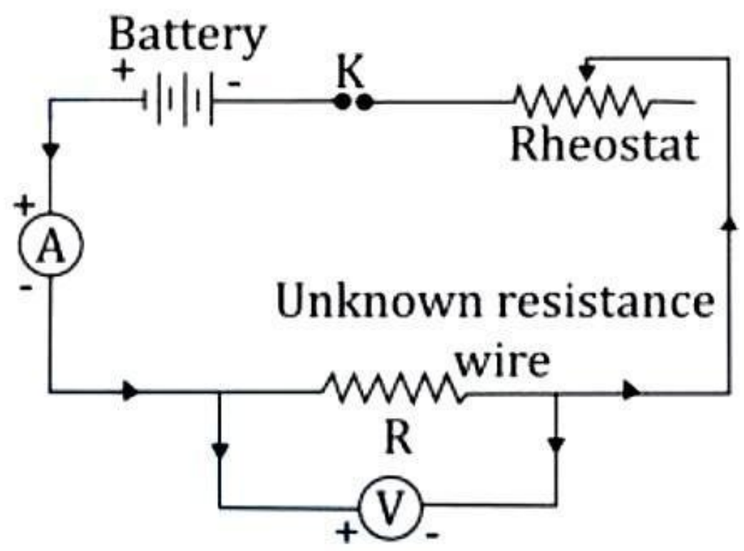
AIM

To assemble the components of a given electrical circuit.

MATERIAL REQUIRED

A battery of two primary cells, two resistors, an ammeter, a voltmeter, a rheostat, a one-way key, and connecting wires.

DIAGRAM



Series combination of two resistors

THEORY

In an electrical circuit, an ammeter is always connected in series and a voltmeter is always connected in parallel to the two points of a circuit across which potential difference is to be measured. Two resistors may be joined in parallel or in a series combination in the circuit.

PROCEDURE

Draw a circuit diagram as given below:

1. Connect all electrical components as shown in the circuit diagram Fig.
2. Test the connections by closing the key. You must note that the current should enter at the positive terminal of a meter. The readings of the ammeter and the voltmeter should increase or decrease simultaneously when the connections are made correctly. Otherwise, the connections should be checked again.

RESULT

As the circuit is working properly the given components have been assembled correctly.

PRECAUTIONS

1. The ends of the connecting wires should be cleaned properly with sandpaper.
2. While connecting different electrical components, make tight connections.
3. In the circuit, always connect the ammeter in series and the voltmeter in parallel to the resistor.
4. Ammeter and voltmeter should be connected such that the current enters its positive terminal and leaves from the negative terminal.

SOURCES OF ERROR

1. Voltmeter/ammeter may not be connected with the correct polarity in the circuit.

2. Ammeter may be connected in parallel.

3. Voltmeter may be connected in series.

VIVA- VOCE

Q 1. What is a battery? In what way is its emf increased?

Ans. The battery is a combination of primary cells in a series. The total emf of the combination is the sum of the EMFs of individual primary cells.

Q 2. What do you know about an ammeter?

Ans. An ammeter is essentially a moving coil galvanometer having a very low resistance attached to it in parallel.

Q 3. Why do we always connect an ammeter in series in a circuit?

Ans. Since it has a low resistance, it will not affect the current, if it is put in series.

Q 4. How is the ammeter connected to the battery in the circuit?

Ans. Its positive terminal should be towards the positive terminal of the battery and negative towards the negative terminal of the battery.

Q 5. Can the alternating current be measured by an ammeter?

Ans. No; an ammeter can measure only direct current.

Q 6. What is a voltmeter?

Ans. It is a moving coil galvanometer having a high resistance.

Q 7. What is the use of a voltmeter?

Ans. A voltmeter is used to measure the potential difference between two points.

Q 8. How is the voltmeter connected to the circuit?

Ans. A voltmeter is always put in parallel in the circuit.

Q 9. State Ohm's Law.

Ans. Ohm's Law states that the current passing (I) through a conductor is directly proportional to the potential difference (V) applied across its ends provided the physical conditions such as temperature, density, dimensions, etc., remain the same.

$$I \propto V$$

$$\text{or } \frac{V}{I} = R$$

Where, ' R ' is the resistance of the conductor.

Q 10. What do you mean by resistance?

Ans. Resistance is the property of a conductor under which it obstructs the flow of current in it.

Q 11. What is the effect of temperature on the resistance of a conductor?

Ans. The resistance of a conductor increases with the temperature rise.

Q 12. What is the SI unit of resistance?

Ans. Ohm; denoted by the symbol Ω.