Aim: To verify ohm's law

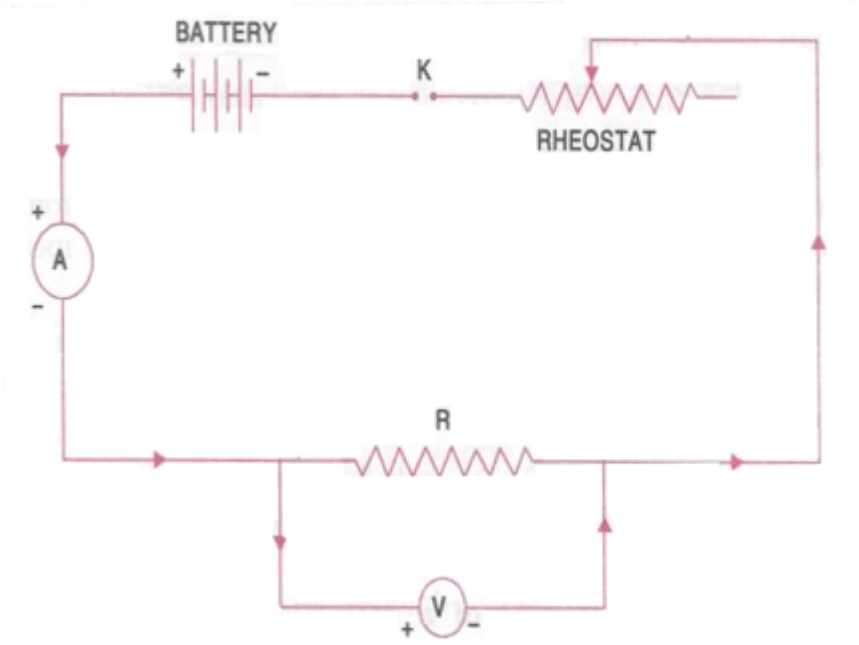
Material required :

A resistor of about 5 Ω, an ammeter (0 - 3 A), a voltmeter (0 - 10 V), four dry cells of 1.5 V each with a cell holder (or a battery eliminator), a plug key, connecting wires, and a piece of sand paper.

Precautions :

- All the electrical connections must be neat and tight.
- Voltmeter and Ammeter must be of proper range.
- The key should be inserted only while taking readings.

Circuit Diagram:



Procedure :

1. Draw the circuit diagram as shown above.
2. Arrange the apparatus as per the circuit diagram.
3. Clean the ends of the connecting wires with sand paper and make them shiny.
4. Make the connections as per circuit diagram. All connections must be neat and tight. Take care to connect the ammeter and voltmeter with their correct polarity. (+ve to +ve and -ve to -ve).
5. Determine the zero error and least count of the ammeter and voltmeter and record them.
6. Adjust the rheostat to pass a low current.

7. Insert the key K and slide the rheostat contact to see whether the ammeter and voltmeter are showing deflections properly.
8. Adjust the rheostat to get a small deflection in ammeter and voltmeter.
9. Record the readings of the ammeter and voltmeter.
10. Take atleast six sets of readings by adjusting the rheostat gradually.
11. Plot a graph with **V** along x-axis and **I** along y-axis.
12. The graph will be a straight line which verifies Ohm's law.
13. Determine the slope of the V-I graph. The reciprocal of the slope gives resistance of the wire.

Observations:

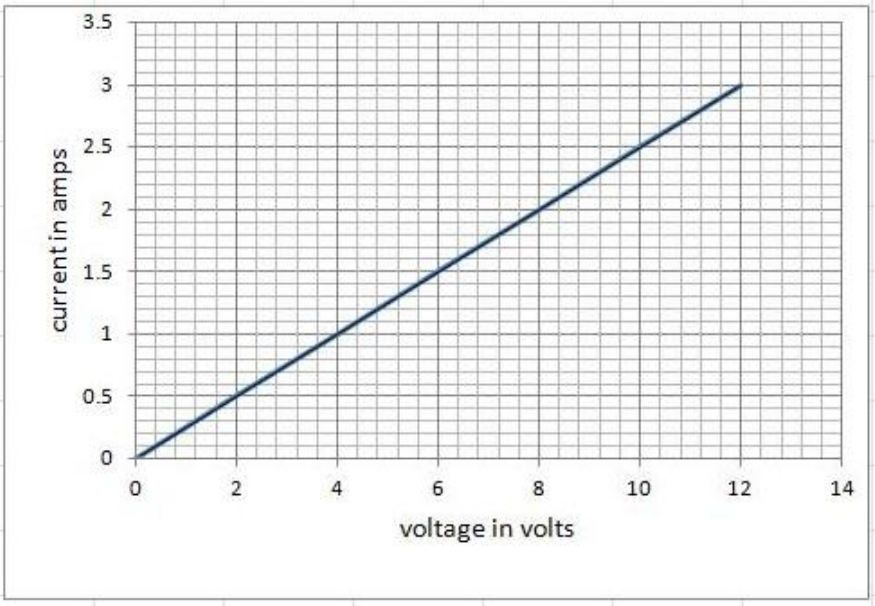
- Range of the given ammeter=..... A.
- Least count of the given ammeter = ... A.
- Range of the given voltmeter = ...V.
- Least count of the given voltmeter = ...V.
- Mean value of V/I from observations, R = ... Ω.

Observation from graph:

- Slope of I vs V graph = ...
- R from graph = 1/ slope = ... Ω.

Observation table:

voltage across	current through
V	A
0	0
2	0.5
4	1
6	1.5
8	2
10	2.5
12	3



As performed in the simulator:

1. Click on **Show Label** checkbox to label/unlable the apparatus in the circuit.
2. Click on **Show Help** checkbox to show/hide the 'help' for performing the lab.
3. Click on the **Observation Table** tab below to open the Observation table.
4. Drag the plug key to switch **on/off** the current.
5. Adjust the rheostat such that ammeter shows the low value of Current (**I**). Note corresponding voltmeter reading.
6. Increase the current by adjusting the slider of the rheostat and take about 5 or 6 sets of readings.
7. Note carefully ammeter and voltmeter readings in each set and record in the **Observation Table**.
8. Note **V/I** ratio for each set of reading in the **Resistance** column.
9. Click on **Plot Graph** button to plot voltmeter readings (**V**) along the x-axis and the corresponding ammeter readings (**I**) along the y-axis in the graph.