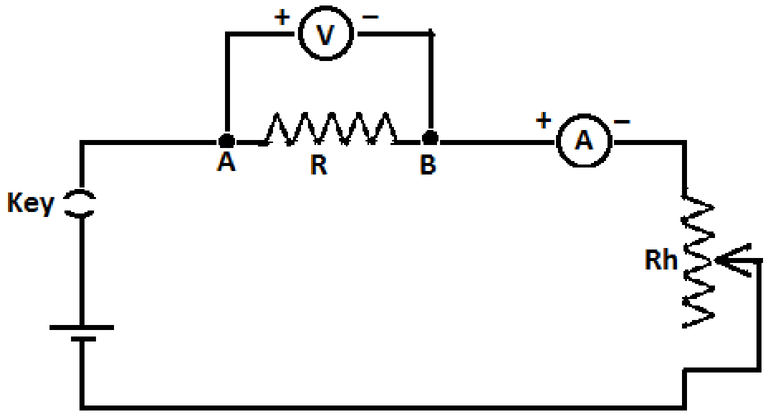
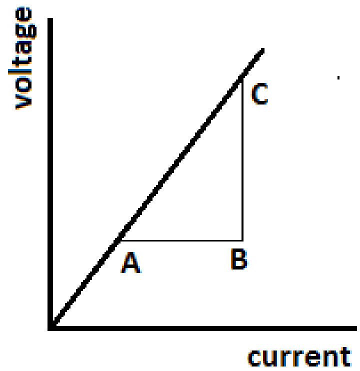
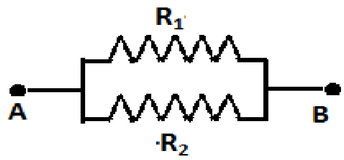


Scale

Origin (0, 0)
Along X axis, 10 division = 0.2 A
Along Y axis, 10 division = 0.2 V



Series connection



parallel connection

Observations and Calculation

To find the resistance of 1^{st} wire **R_1** (of length 50 cm)

Trial No	Ammeter Reading I in ampere	Voltmeter reading V in volt	Resistance $R=\frac{V}{I}$ in ohm	Mean R In ohm
1				R_1= ....ohm
2				
3				
4				
5				
6				

To find the resistance of 2^{nd} wire **R_2** (of length 25 cm)

Trial No	Ammeter Reading I in ampere	Voltmeter reading V in volt	Resistance $R=\frac{V}{I}$ in ohm	Mean R In ohm
1				R_2= ....ohm
2				
3				
4				
5				
6				

0HM'S LAW 2

AIM

1. Compare resistance of given two wires by ohm's law.
2. Compare resistance of given two wires by drawing V-I graph.
3. Verify law of combination of resistance in series.
4. Verify law of combination of resistance in parallel.

APPARATUS

Cell, key, the given wire, voltmeter, ammeter, rheostat, connecting wire

THEORY

Ohm's law states that at constant temperature, the potential difference across the ends of a conductor is directly r to current flowing through the conductor.

Resistance of the conductor **R** = $\frac{V}{I}$

From V-I Graph , Resistance **R** = $\frac{BC}{AB}$

Ratio of resistance of two wire = $\frac{R_1}{R_2}$

When to resistance R_1 & R_2 are connected in series the effective resistance in given by $R_s = R_1 + R_2$.

When to resistance R_1 & R_2 are connected in Parallel the effective resistance in given by

$$R_p = \frac{R_1 R_2}{(R_1 + R_2)}$$

PROCEDURE

Connections are made as shown in fig.

The key is pressed & rheostat is adjusted to get a current 0.8A in the ammeter. The corresponding volt meter reading is noted.

To find the effective resistance when R_1 & R_2 are **connected in series**

Trial No	Ammeter Reading I in ampere	Voltmeter reading V in volt	Resistance $R=\frac{V}{I}$ in ohm	Mean R In ohm
1				R_s = ...ohm
2				
3				
4				
5				
6				

Experimental value R_s= ....

To find the effective resistance when R_1&R_2 are **connected in parallel**

Trial No	Ammeter Reading I in ampere	Voltmeter reading V in volt	Resistance $R=\frac{V}{I}$ in ohm	Mean R In ohm
1				R_p = ...ohm
2				
3				
4				
5				
6				

Experimental value R_p= ....ohm

Ratio of resistance of two wires by ohm's law= $\frac{R_1}{R_2}$ = ...

Ratio of resistance of two wires from graph, = $\frac{R_1}{R_2}$ = ...

Effective resistance in series connections (Theoretical value) ,

$R_s=R_1+R_2$ = ... ohm

Effective resistance in parallel connections (Theoretical value),

$$R_p = \frac{R_1 R_2}{(R_1 + R_2)} = \text{.................ohm}$$

The current is increased as ,1.2 A, 1.4 A, 1.6 A..........& in each time voltmeter reading is recorded. Now **R=**$\frac{V}{I}$ is calculated & mean value is taken.

A V-I graph is plotted & slope of V-I graph gives resistance R_1 of the conductor.

Now first wire is replaced by second wire & the experiment is repeated as in the previous case.

The mean value of R_2 is determined.

Now, R_1, R_2 are connected in series & parallel. The whole procedure is repeated in both cases & the effective resistance R_1 & R_2 are calculated.

RESULT

1. Ratio of resistance of two wires by ohm's law, $\frac{R_1}{R_2}$**=..............**
2. Ratio of resistance of two wires from graph, $\frac{R_1}{R_2}$**=..............**
3. Effective resistance in series connections
   a. Theoretical value **R_s = ...ohm**
   b. Experimental value **R_s =.............ohm**

The Theoretical value & Experimental value agrees & hence law of combination of resistance in series is verified.

4. Effective resistance in parallel connections
   a. Theoretical value **R_p = ... ohm**
   b. Experimental value **R_p = ...ohm**

The Theoretical value & Experimental value agrees & hence law of combination of resistance in parallel verified.