PRACTICIAL: 9

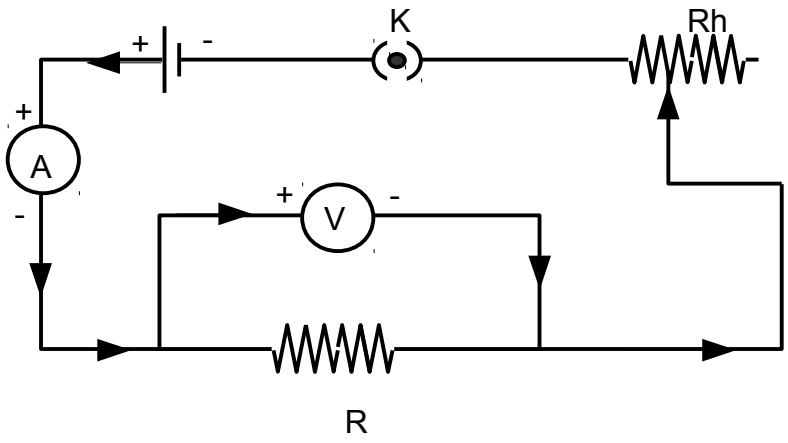
Verification of combination of Resistance

AIM: To verify the law of combination (series) of resistance using Ohm`s law.

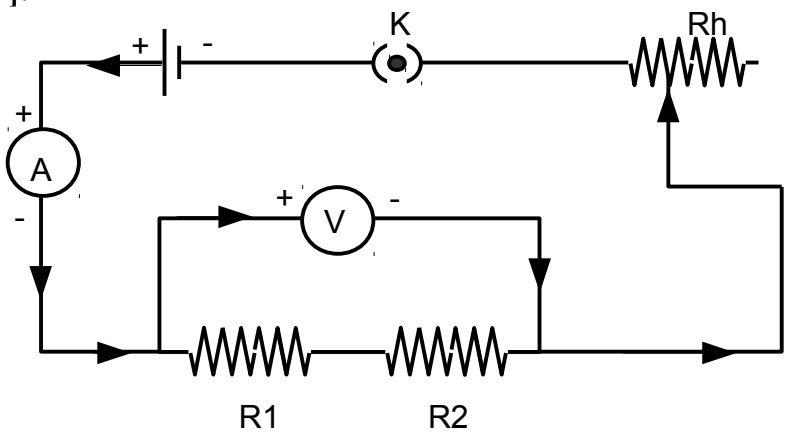
APPARATUS: A battery, an ammeter, voltmeter, rheostat, plug key, two resistance coils of unknown value , connecting wire, etc...

CIRCUIT DIAGRAM:

[Circuit – A]:



[Circuit – B]:



PROCEDURE:

1. Mark the two resistance R_1 and R_2.
2. The circuit is connected as per the circuit diagram-A
3. Connect resistance coil R_1 across voltmeter in circuit diagram-A
4. Close the circuit by inserting the plug key in the key K and see that ammeter and voltmeter are working properly.
5. By shifting the position of sliding contact of the rheostat, change the value of potential difference V and current I in small steps and read the value of V and I from voltmeter and ammeter respectively. In this manner take atleast 2 readings. And calculate R_1.
6. Now remove the key and switch off the supply.
7. Replace R_1 by R_2.
8. Repeat step 4 and 5. And calculate R_2.
9. Connect R_1 and R_2 in series and connect the combination across voltmeter as shown in circuit diagram-B.
10. Repeat step 4 and 5. And calculate R_1+R_2.

OBSERVATIONS:

1. Range of Voltmeter =_____ V
2. Range of Ammeter =_____ A
3. Least count of voltmeter (1Div)= _____ V
4. Least count of ammeter (1Div)= _____ A
5. E.M.F of the Battery = _____V

OBSERVATION TABLE:

Resistance Used	Ob. No.	Potential Difference **V volt**	**Current I amp.**	Resistance **V / I = R Ω**	Mean Resistance
R_1	1				
	2				
R_2	1				
	2				
R_1+R_2	1				
	2				

RESULT:

Within limits of experimental error, the experimentally obtained value of resistance in series combination is same as the value obtained from the formula. Hence the law of combination of resistance in series is verified.

Viva :

1. State Ohm`s Law.
2. What is a Voltmeter?
3. What is an ammeter?
4. What is a resistance?
5. On what factors does thee resistance of a conductor depends?
6. What are ohmic resistance? Give two examples.
7. What is S.I. Unit of resistance?
8. Why ammeter connected in series only?
9. What is the function of rheostate in the circuit?
10. What are the application of Ohm`s law.
11. What are the limitations of Ohm`s law?
12. In which arrangement/combination of resistance the resultant resistance is high?
13. Give two examples of series combination of resistance.

Precautions:

1. All the connections must be very tight.
2. Record the current at the regular intervel of voltage.
3. While changing the voltage, rheostate must be move in one direction only.
4. Lest count of voltmeter and ammeter must be properly calculated.
5. Do not pass a large current through the resistance.
6. While measuring the voltage and current the needle of meters should not move out of the scale.