Ohm's Law I

AIM: To Determine the resistivity of the material of the given wire by Ohm's law. Screw gauge is supplied

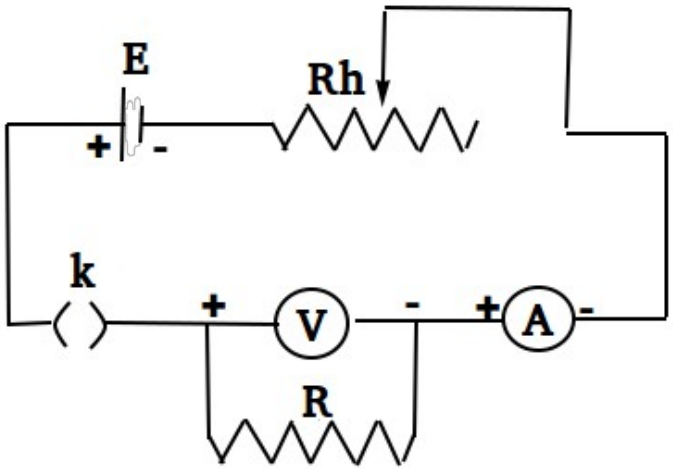
APPARATUS: Cells, Ammeter, Voltmeter, Rheostat, Key, Screw Gauge, Meter Scale, Connecting wires etc

THEORY: At constant temperature, the current passing through the conductor is directly proportional to the potential difference across the conductor.

That is **V α I** or $\frac{V}{I}=R$ the resistance of the conductor.

The resistivity of the material of the conductor $\rho=\frac{\pi r^2 R}{L}$

where **r** is the radius and **L** is the length of the conductor.



OBSERVATIONS:

1. **To find the resistance of the wire (R)**

Least Count of the ammeter = A

Least Count of the voltmeter = V

Length of the resistance wire L= cm

= m

Trial No	Ammeter Reading (I) Ampere	Voltmeter Reading (V) Volts	$R=\frac{V}{I}$ Ω	Mean R Ω
1				
2				
3				
4				
5				
6				
7				

2. **To find the radius of the wire (r)**

Value of One Pitch Scale Division = mm

Pitch of the screw $P = \frac{Distance\ Moved}{Number\ of\ Rotations}$ = mm

Number of Divisions on the head scale N =

Least Count LC = $\frac{Pitch}{N}$ = mm = mm

Zero Coincidence = Divisions Zero Correction = Divisions

Sl No	Pitch Scale Reading (**PSR**) mm	Observed Head Scale Reading (**HSR**)	Corrected Head Scale Reading (**Corr. HSR**)	Total Reading PSR + (Corr. HSR x LC)	Mean (d) mm
1					
2					
3					
4					
5					
6					

Radius of the wire $r = \frac{d}{2}$ = cm = m

CALCULATIONS:

The resistivity of the material of the conductor $\rho = \frac{\pi r^2 R}{L}$ =

= Ω m

RESULT:

1. Voltage is found proportional to the current. Hence Ohm's Law is verified
2. Resistance of the given wire = Ω
3. Resistivity of the material of the wire = Ω m