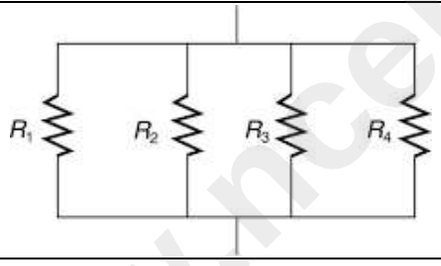
Electricity

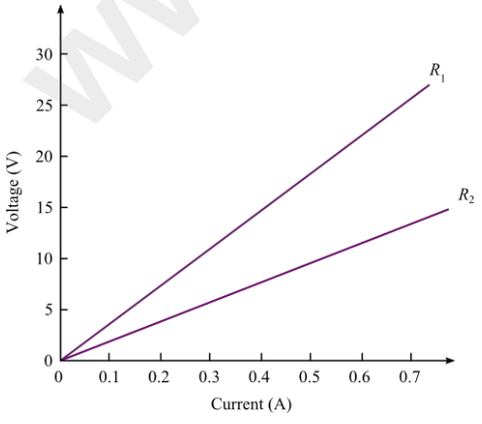
Quantity	Definition	Unit	Expression
Electric Current	Flow of charges constitute current in opposite direction	ampere (A)	$I = \frac{Q}{t}$
Potential	Work done in moving a unit charge from infinity to the given point	volt	$V = \frac{W}{Q}$
Voltage	Potential difference between two points	volt	$V_{AB} = V_A - V_B$
Resistance	Opposition to flow of charges (Depends on Dimensions)	ohm (Ω)	$R = \frac{V}{I}$
Resistivity	Opposition to flow of charges for a given material (Independent of Dimensions)	ohm-metre (Ω m)	$\rho = \frac{RA}{l}$
Power	Rate of consumption or generation of energy	watt (W)	$P = I^2R = \frac{V^2}{R}$
Energy	Capacity to do work	joule (J)	$E = I^2Rt = \frac{V^2}{R}t$

Resistor Connections:

Type	Definition	Equivalent Resistance	Characteristic
Series		$R_{eq} = R_1 + R_2 + R_3 + \cdots + R_n$	Same current through all the resistors
Parallel		$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \cdots + \frac{1}{R_n}$	Same voltage across each resistor

Ohm's Law: $V = IR$

$(R_1 > R_2)$



Joule's Law of Heating: $H = I^2Rt$