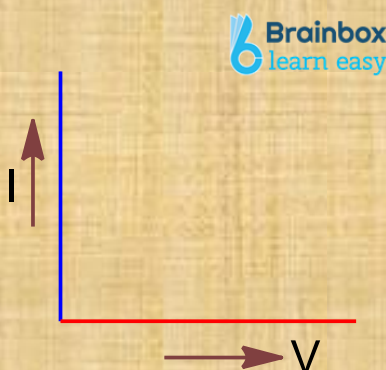


Chapter Three

CURRENT ELECTRICITY

Limitations of OHM's Law:

- 1) $V \propto I$ holds good only for certain materials.(Ohmic conductors).



- 2) The relationship between V and I depends upon sign of V .

Ex. For diode $V - I$ curve is not similar for +ve and -ve values of V .

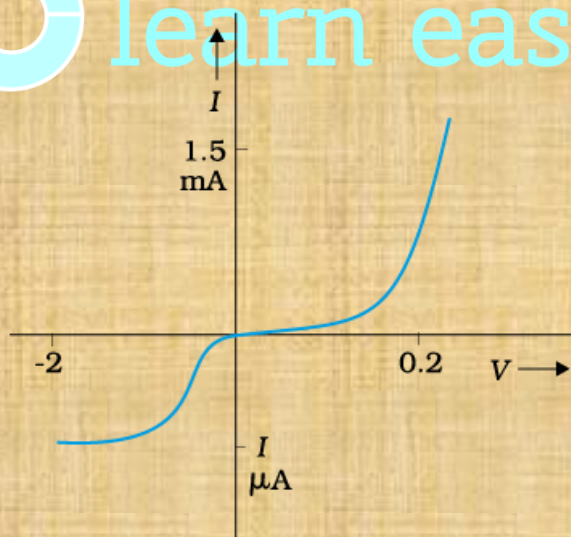


Fig. Characteristic curve of a diode. Note the different scales for negative and positive values of the voltage and current

- 3) The relationship between $V - I$ is not unique. There is more than one value for V for same current.

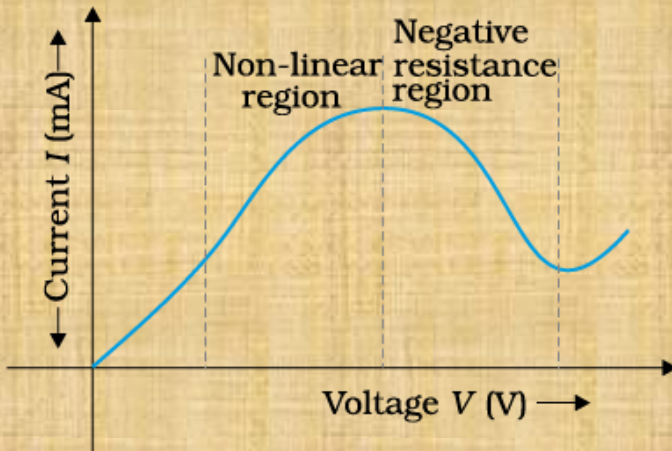


Fig. Variation of current versus voltage for GaAs.

Resistivity of various materials:

Conductors – Metals – $10^{-8} \Omega\text{m}$ to $10^{-6} \Omega\text{m}$

Semiconductors – Ge, Si – $10^{-5} \Omega\text{m}$

Insulators – Ceramic glass – 10^{18} times metals

