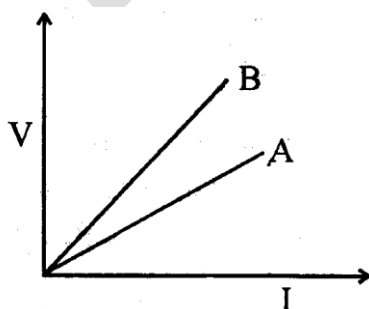


18. A wire of resistance  $4\Omega$  is drawn  
(a) to twice its original length  
(b) to thrice its original length.  
Calculate the new resistance in each case

19[P]. A wire of resistance  $4R$  is bent in to the form of a circle. What is the effective resistance between the ends of diameter?

20[P]. A copper wire is in the form of a cylinder and has a resistance  $R$ . It is stretched till its thickness reduces by half of its initial size. Find its new resistance in terms of  $R$ .

21[P]. The voltage current graph for two resistors of the same material and same radii with lengths  $L_1$  and  $L_2$  are shown in the figure. If  $L_1 > L_2$ , state with reason, which of these graphs represents voltage current change for  $L_1$ .



22[Q]. Two wires of equal lengths, one of copper and the other of manganin,

have the same resistance. Which wire is thicker?

23. Why copper is used as for making connecting wires?

Ans: Copper has low resistivity.

24. Why Nichrome is used as heating element of electrical devices?

Ans: Nichrome has

i) High resistivity

ii) High melting point.

25. Why aluminium wires are preferred for overhead power cables?

Ans: Aluminium has low resistivity. It is cheaper and lighter.

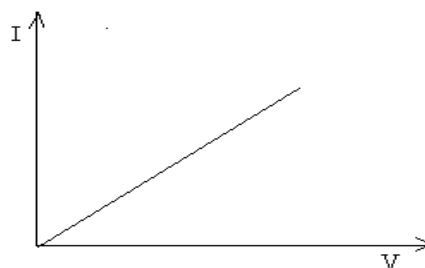
26. What are Ohmic and Non-ohmic substances?

Ans:

Ohmic substances

They are the substances which obey ohm's law. For these substances V-I graph is linear.

Eg: Metals



Non - ohmic substances

They are the substances which do not obey ohm's law. For these substances V-I graph is nonlinear.

$$I_1 = \frac{V}{R_1} \quad I_2 = \frac{V}{R_2} \quad I_3 = \frac{V}{R_3}$$

$$\therefore (2) \rightarrow \frac{V}{R_p} = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3}$$

$$\boxed{\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}}$$

If there are n resistors

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots + \frac{1}{R_n}$$

**38[P].** (a) Three resistors  $1\ \Omega$ ,  $2\ \Omega$  and  $3\ \Omega$  are combined in series. What is the total resistance of the combination?

(b) If the combination is connected to a battery of emf  $12\text{V}$  and negligible internal resistance, obtain the potential drop across each resistor.

**39[P].** (a) Three resistors  $2\ \Omega$ ,  $4\ \Omega$  and  $5\ \Omega$  are combined in parallel. What is the total resistance of the combination?

(b) If the combination is connected to a battery of emf  $20\text{V}$  and negligible internal resistance, determine the current through each resistor and the total current drawn from the battery.

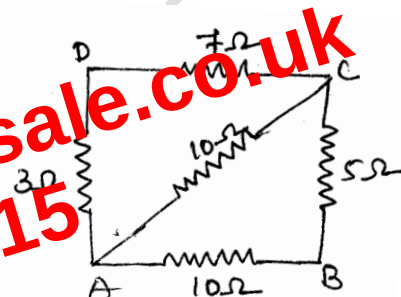
**40[P].** Given n resistors each of resistance 'R'. How will you combine them to get the (i) maximum (ii)

minimum effective resistance? What is the ratio of the maximum to minimum effective resistance?

**41[P].** Determine the equivalent resistance of the network shown in figure.



**42[P].** Find the equivalent resistance between A and B.



**43.** Define internal resistance of a cell.

**Ans:** In the external circuit, the current flows from the positive terminal of the cell to the negative terminal. But inside the cell the current flows from -ve terminal to the +ve terminal.

“Internal resistance of a cell is the resistance offered by the electrolyte and electrodes of the cell”.