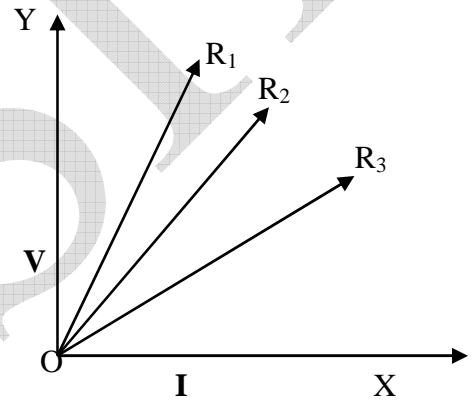


## Chapter -3 Electricity

### 1 – Mark Questions

1. Give relation between 1 volt, 1 joule and 1 coulomb. Name that physical quantity.
2. A wire of resistance  $4\ \Omega$  is bent to form a circle. What is the resistance between two diametrically opposite ends?
3. State and define SI unit of resistance.
4. A conductor of radius 'r' has a resistance of  $20\ \Omega$ . If the radius is halved, what will be the new resistance? Assume all other parameters remain constant.
5. How is an Ammeter and voltmeter connected in the electric circuit?
6. State which has higher resistance,  $50\text{W}, 220\text{V}$  or a  $25\text{W}, 220\text{V}$  lamp bulb.
7. V-I graph of three resistors is given. Which of the three has minimum and which has maximum resistance?

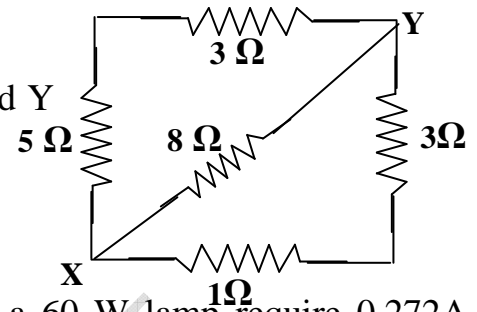


### 2 – Mark Questions

1. Calculate the amount of charge that would flow in one hour through the element of an electric iron drawing a current of  $0.4\text{A}$ .
2. The resistance of a wire of length  $80\text{cm}$  and of uniform area of cross section  $0.025\text{cm}^2$ , is found to be  $1.5\ \Omega$ . Calculate Resistivity of wire in SI units.
3. Series arrangement is not used for household circuits. Why?
4. What is the highest and lowest total resistance that can be secured by combination of four resistor of resistance  $4\ \Omega, 8\ \Omega, 12\ \Omega$  and  $24\ \Omega$ ?
5. What are SI unit and commercial unit of electrical energy? Derive relation between them.
6. What is fuse? How does it function?
7. Draw a schematic diagram of circuit consisting of a battery of five  $2\ \text{V}$  cells,  $5\ \Omega$  resistor, a  $10\ \Omega$  resistor, a  $15\ \Omega$  resistor, and a plug key, all connected in series. Calculate the electric current passing through the above circuit when the key is closed.

### 3 – Mark Questions

1. What is the equivalent resistance between the points X and Y for the following circuit?



2. A 40 W lamp requires 0.182A current at 220 V, while a 60 W lamp require 0.272A current at 220V. If both lamps are connected in series with 220V line, how many amperes of current will flow through each lamp.  
State the formula correlating the electric current flowing in a conductor and the voltage applied across it. Also show this relationship by drawing a diagram.
3. What would be the resistance of a conductor if the current flowing through it is 0.35 ampere when the potential difference across it is 1.4V?
4. In a household, 5 tube lights of 40 W each are used for 5 hours and an electric iron of 1000 W is used for 4 hours every day. Calculate the total energy consumed by tube lights and the electric iron in the month of March.
5. A resistor of 6 Ω is connected in series to another resistor of 4 Ω resistance. A potential difference of 20 V is applied across the combination. Calculate the current through the circuit and the potential difference across the 6 Ω resistor.
6. Explain: (a) Why tungsten used almost exclusively for making filament of electric lamps?  
(b) Why is parallel arrangement is used for domestic circuits?
7. Three resistances of which two are equal when connected in series have an effective resistance of 30Ω. When these three resistances are connected in parallel, the effective resistance is 3 Ω. Find the values of individual resistances.

### 5 – Mark Questions

1. Express Ohm's law mathematically and by a graph. State SI unit of resistance and resistivity. What will be the equivalent resistance of two resistance of two resistors  $R_1$  and  $R_2$  connected in (i) series and (ii) parallel?
2. (i) Why are the coils of electric irons and electric toasters made of an alloy rather than a pure metal?  
(ii) How does the resistance vary with length and area of cross section of a material?  
(iii) A torch bulb is rated 2.5 V and 750mA. Calculate (a) power (b) its resistance (c) the energy consumed if the bulb is lighted for 4 hours.