



**v) Electric potential and e.m.f:**

- a) are the same terms                      b) are the different terms  
c) have different units                    d) both b) and c)

**vi) When we double the voltage in a simple electric circuit, we double the:**

- a) current                                      b) power  
c) resistance                                  d) both a) and b)

**vii) If we double both the current and the voltage in a circuit • while keeping its resistance constant, the power:**

- a) remains unchanged                      b) halves  
c) doubles                                      d) water

**viii) What is the power rating of a lamp connected to a 12 V source when it carries 2.5A?**

- a) 4.8 W                                        b) 14.5 W  
c) 30 W                                         d) 60 W

**ix) The combined resistance of two identical resistors, connected in series is 8 a Their combined resistance in a parallel arrangement will be:**

- a) 2  $\Omega$                                         b) 4  $\Omega$   
c) 8  $\Omega$                                          d) 1 2 $\Omega$

**ANSWERS**

- i) d      ii) c      iii) b      iv) c      v) a  
vi) a      vii) c      viii) c      ix) a

**REVIEW QUESTIONS**

**14.12 The voltage chosen for the transmission of electrical power over large distance is many times greater than the voltage of the domestic supply. State two reasons why electrical power is transmitted at high voltage?**

**Answer**

**1)** As we know that, power  $P = VI$ , so if we keep the current high the power loss due to high resistance will be more, therefore instead of high current, voltage of transmission is kept high.

**2)** Voltage is transmitted in the form of electrical energy from the power station to the household electrical circuits. Therefore, it is kept lower for domestic supply according to the requirement of the appliance at houses.

**14.13 Why the voltage used for the domestic supply is much lower than the voltage at which the power is transmitted?**

**Answer**

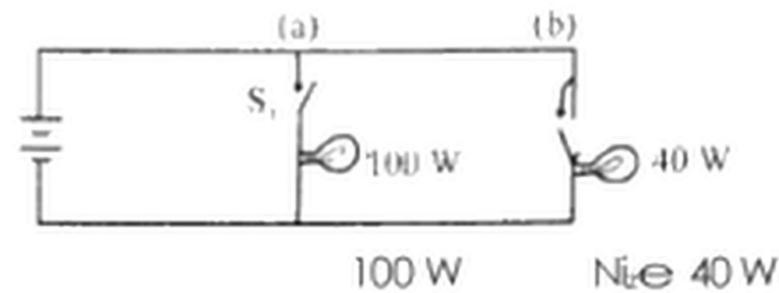
The voltage transmitted from the power station is transmitted to grid stations and then to local transformers. Then the voltage is distributed to different houses. As the requirement of voltage at houses is much smaller than the

voltage at power station therefore 240V voltage is normally transmitted to houses.

**14.16 Design a circuit diagram for a study room that needs the following equipment in parallel:**

- One 100 W lamp operated by one switch;
- One reading lamp fitted with a 40 W bulb which can be switched ON and OFF from two points.
- What is the advantage of connecting the equipment in parallel instead of series combination?

**Answer**



- Same voltage is gained by all the appliance in parallel with the voltage source.

## CONCEPTUAL QUESTIONS

**14.1 Why in conductors charge is transferred by free electrons rather than by positive charges?**

**Answer**

In conductors there are majority of free electrons which can easily flow from one place to another place while the positive charges remain stationary at their respective position. That is why charge is transferred by free electron rather than by positive charge.

**14.2 What is the difference between a cell and a battery?**

**Answer**

A battery can be re-charged but a cell cannot be re-charged.

**14.3 Can current flow in a circuit without potential difference?**

**Answer**

No. To flow the current through a circuit, potential difference is necessary otherwise no current can flow.

**14.4 Two points on an object are at difference electric potentials. Does charge necessarily flow between them?**

**Answer**

Yes. The flow the charges between the two points of an object is only possible if there is some potential difference between these points.

**14.5 In order to measure current in a circuit why ammeter is always connected in series?**

**Answer**

The resistance of ammeter is kept low so that maximum current can flow through it if it is connected in series in the circuit. In this way an accurate value of current can be measured.

**14.6 In order to measure voltage in a circuit voltmeter is always connected in parallel. Discuss.**

**Answer**

The resistance of voltmeter is kept high so that maximum voltage can drop across the resistance if it is connected in parallel to the potential source in the circuit.

**14.7 How many watt-hours are there in 1000 joules?**

**Answer**

We know that,  $1Kwh = 36 \times 10^5 J$

Or  $1Wh = 3600J$

$$1J = \frac{1}{3600} \text{Watt} - \text{hour}$$

$$1000J = \frac{1000}{3600} \text{Watt} - \text{hour}$$

$$1000J = 0.28 \text{Watt} - \text{hour}$$

**14.8 From your experience in watching cars on the roads at night, are automobile head lights connected in series or in parallel?**

**Answer**

Automobile headlights are connected in parallel with the battery to get maximum voltage. Because the battery is also providing the voltage to the other electricals parts of the automobile at the same time. In case of series circuit, the head lights may get dim.

**14.9 A certain flash-light can use a 10 ohm bulb or a 5 ohm bulb. Which bulb should be used to get the brighter light? Which bulb will discharge the battery first?**

**Answer**

The flash-light of  $10\Omega$  may consume more electrical energy (voltage) and will produce bright light as compared to  $5\Omega$ . The same flash-light may discharge the battery first.

**14.10 It is impracticable to connect an electric bulb and an electric heater in series. Why?**

**Answer**

In case of series circuit, voltage is divided depending upon the resistances therefore the electric bulb and electric heater will give divided electrical energy (voltage).

**14.11 Does a fuse in a circuit control, the potential difference or the current?**

**Answer**

The fuse in circuit controls only the current therefore it is connected in series with the live wire.

