

Electricity

1. What is meant by saying that the “potential difference between two points is 1 volt”?
2. Define electric power. What is its S.I. unit?
3. A wire of resistivity ‘ ρ ’ is stretched to twice its length. What is new resistivity?
4. Define the unit ‘ohm’.
5. Name a device that helps to maintain a potential difference across a conductor.
6. Define resistivity. Write the S.I. unit of resistivity.
7. Will current flow more easily through a thick wire or thin wire of the same material when connected to the same sources? Why?
8. A wire of resistance 10Ω is drawn out so that its length is thrice its original length. Calculate its new resistance (resistivity and density of the wire remain unchanged).
9. Define resistivity and state its S.I. unit. Does its value vary with temperature?
10. What are the factors on which the resistance of a conductor depends? Give the corresponding relation.
11. What is voltmeter? How is it connected in a circuit?
12. Three resistances R_1 , R_2 and R_3 are connected in parallel. Find their equivalent resistance (resultant resistance).
13. What is electric current? What do you understand by the conventional direction of the flow of current? How is the unit ampere defined?
14. (a) Name two factors on which the electric energy consumed by an electrical appliance depends.
(b) In which of the following cases more electrical energy is consumed per hour?
(i) A current of 1 ampere passed through a resistance of 300 ohms.
(ii) A current of 2 amperes passed through a resistance of 100 ohms.
15. (a) What is meant by ‘Electric Resistance’ of a conductor?
(b) A wire of length L and resistance R is stretched so that its length is doubled and the area of cross-section is halved. How will its:
(i) resistance change? (ii) resistivity change?
16. Three resistances R_1 , R_2 and R_3 are joined in series. Find their equivalent resistance.

17. State ohm's law. Describe an experiment with a neat labelled circuit diagram to verify ohm's law.
1. Why is very less quantity of heat energy produced in the connecting wires?
2. Which one has more resistance 100 watt bulb or 60 watt bulb?
3. How much energy is given to each coulomb of charge passing through a 6V battery?
4. What determines the rate at which energy is delivered by a current?
5. What does an electric circuit mean?
6. Name a device that helps to maintain a potential difference across a conduct.
7. Judge the equivalent resistance when the following are connected in parallel
(a) $1\ \Omega$ and $10^6\ \Omega$ (b) $1\ \Omega$ and $10^3\ \Omega$ and $10^6\ \Omega$.
8. Define the term electric energy. Write an expression for the electric energy consumed in an electric circuit.
9. What is meant by power-rating of an appliance? A bulb is rated as 60 W, 220 V. What does it indicate?
10. Let the resistance of an electrical component remains constant while the potential difference across the two ends of the component decreases to half of its former value. What change will occur in the current through it?
11. A piece of wire is drawn by pulling it unit is length is doubled. Compare the new resistance with the original value.
12. State ohm's law. Express it mathematically. Define S.I. unit of resistance.
13. Draw a circuit diagram with a cell, an electric bulb, an ammeter and plug key.
14. For a heater rated at 4kW and 220V, calculate
(a) The current (b) The resistance of the heater (c) The energy consumed in 2 hours .
15. An electric lamp of $100\ \Omega$, a toaster of resistance $50\ \Omega$, and a water filter of resistance $500\ \Omega$ are connected in parallel to a 220 V source. What is the resistance of an electric iron connected to the same source that takes as much current as all three appliances, and what is the current through it?
16. What are the advantages of connecting electrical devices in parallel with the battery instead of connecting them in series?

17. How can three resistors of resistances $2\ \Omega$, $3\ \Omega$, and $6\ \Omega$ be connected to give a total resistance of (i) $4\ \Omega$ (ii) $1\ \Omega$?
1. What is meant by saying that the potential difference between two points is 1V?
 2. On what factors does the resistance of a conductor depend?
 3. What determines the rate at which energy is delivered by a current?
 4. An electric motor takes 5 A from a 220 V line. Determine the power of the motor and the energy consumed in 2 h.
 5. What is the S.I. unit of electric potential?
 6. What is meant by the statement, potential difference between points A and B in an electric field is 1 volt?
 7. Define the term electrostatic potential? What is the S.I. unit for it?
 8. What are the advantages of connecting electrical devices in parallel with the battery instead of connecting them in series?
 9. Why nichrome elements is commonly used in household appliances.
 10. Ten bulbs are connected in a series to a power supply line. Ten identical bulbs are connected in parallel circuit to an identical power supply line.
 - (a) Which circuit would have the highest voltage across each bulb?
 - (b) In which circuit would the bulbs be brighten?
 11. Why coils of electric toasters and electric iron are made of an-alloy rather than a pure metal?
 12. Draw a diagram of a circuit consisting of a battery of three cell of 2 V each, a $5\ \Omega$ resistor, an $8\ \Omega$ resistor, and a $12\ \Omega$ resistor, and a plug key, all connected in series.
 13. Why does the cord of an electric heater not glow while the heating element does?
 14. (i) What is meant by “Electric Resistance” of a conductor?
 (ii) A wire of length L and resistance R is stretched so that its length is doubled and the area of cross-section is halved. How will its (a) resistance change?
 (b) Resistivity change?
 15. In a household 5 tube lights of 40 W each are used for 5 hour and an electric press of 500 W for 4 hours every day. Calculate the total electrical energy consumed by the tube lights and press in a month of 30 days.

1. Which metal offers higher resistance to the passage of electricity than copper?
2. A wire of resistance 10 ohm is bent in the form of a closed circle. What is the effective resistance between the two points at the ends of any diameter of this circle?
3. What is the S.I. unit of charge?
4. State ohm's law.
5. Define electric resistance?
6. Compute the heat generated while transferring 96000 coulomb of charge in one hour through a potential difference of 50 V.
7. When a 12 V battery is connected across an unknown resistor, there is a current of 2.5 mA in the circuit. Find the value of the resistance of the resistor.
8. Two lamps, rated 100 W at 220 V, and 60 W at 220V, are connected in parallel to electrical mains supply. What current is drawn from the line if the supply voltage is 220 V?
9. An electric heater of resistance 8Ω draws 15 A from the service mains 2 hours. Calculate the rate which heat is developed in the heater
10. An electric iron has a rating of 750 W, 220 V. Calculate (i) Current passing through it, and (ii) its resistance, when in use.
11. A torch bulb is rated 2.5 V and 750 mA. Calculate (i) Its power (ii) its resistance and (iii) the energy consumed in 4 hours.
12. Two electric lamps of 100 W and 25 W, respectively are connected in parallel to a supply voltage of 200 V. Calculate total current flowing through the circuit.
13. What do you understand by the electrical resistance of a wire? State and define S.I. unit of resistance.
The resistance of an electric lamp filament is 230 ohms. The lamp is switched on when the line voltage is 115 volts. What is the current in the lamp circuit?

1. What is the unit of resistance?
2. The potential difference between the terminals of an electrical iron is 240 V and the current is 5.0 A. What is resistance of the electric iron?
3. Why do we copper wires as connecting wires?
4. What is the S.I. unit of electric power?

5. How many joules are in one watt-hour?
 6. An electric lamp is marked 100 W, 220 V. It is used for 5 hour daily. Calculate
 - (i) its resistance while glowing
 - (ii) energy consumed in kWh per day.
 7. A bulb is rated at 5.0 volt, 100 mA. Calculate its (i) power (ii) resistance.
 8. An electric bulb draws a current of 0.2 A when the voltage is 220 volts. Calculate the electric charge flowing through it in one hour.
 9. What is a voltmeter? How is it connected in a circuit?
 10. Which of the two has greater resistance: a 1 kW heater or a 100 W tungsten bulb, both marked for 230 V?
 11. What are the factors on which the resistance of a conductor depends? Give the corresponding relation.
 12. A copper wire of length 2 m and area of cross-section $1.7 \times 10^{-6} \text{ m}^2$ has a resistance of 2×10^{-2} ohms. Calculate the resistivity of copper.
 13.
 - (a) Why are coils of electric irons and electric toasters made of an alloy rather than a pure metal?
 - (b) How does the resistance of a wire vary with its:
 - (i) area of cross-section? (ii) Diameter?
 - (c) What will be the resistance of a metal wire of length 2 metres and area of cross – section $1.55 \times 10^{-6} \text{ m}^2$, if the resistivity of the metal be $2.8 \times 10^{-8} \Omega \text{ m}$?
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1. Why a cord carrying an electric current does not glow while heating element does?
 2. A wire of resistance 2 ohm has been connected to a source of 50 V at its two ends. What is the current flowing through the wire?
 3. A bird sitting on an 11,000 V wire is quite safe but a man touching 220 V wire may die. Why so?
 4. What is meant by saying that the potential difference between two points is 1 V?
 5. Several electric bulbs designed to be used on a 220 V electric supply line are rated 10 W. How many lamps can be connected in parallel with each other across the two wires of 220 V line if the maximum allowable current is 5 A?
 6. Two resistors when connected in parallel, give resultant value of 2 ohm. When connected in series, the value becomes 9 ohm. Calculate the value of each resistance.
 7. A copper wire has diameter 0.5 mm and resistivity $1.6 \times 10^{-8} \text{ ohm m}$. What

will be the length of this wire to make its resistance 10 ohm? How much does the resistance change if the diameter if the diameter is doubled?

8. An electric lamp of 100 ohm, a toaster of resistance 50 ohm and a water filter of resistance 500 ohm are connected in parallel to 220 V source. What is the resistance of the electric iron connected to the same source that takes as much current as all the three appliances and what is the current through it?