BASANT'S SCIENCE ACADEMY

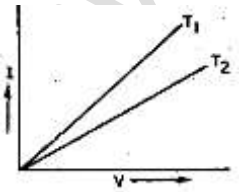
CHA-ELECTRICITY

CONCEPTUAL QUESTIONS

CLASS X
GUESS PAPER
SCIENCE

1. If a wire is stretched to double its original length without loss of mass, how will the resistivity of the wire be influenced?
2. What is the unit of electrical conductance?
3. If x ampere of current flows for y second in a conductor, how much charge in coulomb has passed through that conductor?
4. Specific resistances of copper, constantan and silver are 1.78 x 10^{-6} ohm cm, 3.91 x 10^{-6} ohm cm and 10^{-6} ohm cm respectively. Which is the best conductor and why?
5. Which alloys are used for making standard resistance coils? Why?
6. A conductor has a positive charge of 3.2 x 10^{-17} coulomb. Determine the number of excess or deficit of electrons in the conductor.
7. Arrange the following materials in order, starting with the best conductor and ending with the best insulator: mercury, nichrome, platinum, copper, silver, tungsten, glass, iron, carbon, silicon, hard rubber.
8. Ten identical wires, each having a resistance of one ohm, are joined in parallel. What is the equivalent resistance of this parallel combination?
9. A wire is cut into half. What is the effect on its specific resistance?
10. A silver wire is stretched to make it 1% longer. What is the effect on its (i) resistance (ii) specific resistance?
11. A one metre long wire is bent at 180° in the middle and the two halves are twisted together. What will be the effect on resistance?
12. Find the resistance of eureka wire 1.1 m long and 0.2 mm in diameter. Resistivity of eureka = 49 x 10^{-8} Ω m. What is the current flowing through the wire when a potential difference of 1v applied across its ends.
13. A 4 Ω resistance wire is doubled on it. Calculate the new resistance of the wire.
14. A piece of wire is redrawn by pulling it until its length is doubled. Compare the new resistance with the original value.
15. A wire of resistance 10 Ω is drawn out so that its length is thrice its original length. Calculate its new resistance (resistivity and density of the wire remain unchanged).
16. A wire has a resistance of 16 Ω. It is melted and drawn into a wire of half its length. Calculate the resistance of the new wire. What is the percentage change in its resistance?
17. Two resistances when connected in parallel give resultant value of 2 Ω. When connected in series the value becomes 9 Ω. Calculate the value of each resistance.

18. A bird perches on a bare high power line, and nothing happens to the bird. A man standing on the ground touches the same line and gets a fatal shock. Why?
19. What do you mean by conventional current? Comment on the direction of conventional current.
20. The electron drift speed is estimated to be only a few mm s for currents in the range of a few amperes. How then is current established almost the instant a circuit is closed?
21. "The current-voltage graph for a given metallic wire at two different temperatures T1 and T2are shown in Fig. The temperature T_2 is greater than temperature T_1 ". State whether this statement is true or false, giving, reasons in brief to support your answer.



22. Given the resistances of l Ω, 2 Ω, 3 Ω. How will you combine them to get ah equivalent resistance of (i) 11/3 Ω (ii)11/5 Ω (iii) 6 Ω (iv)6/11 Ω?
23. Two wires of equal lengths, one of copper and the other of manganin, have the same resistance. Which wire is thicker?
24. Two wires A and B of the same metal have the same cross-sectional area and have their lengths in the ratio 2:1. What will be the ratio of currents flowing through them respectively, when the same potential difference is applied across each of them?
25. Two wires A and are of the same metal and of the same length. Their areas of cross-section are in the ratio of 2:1. If the same potential difference is applied across each wire in turn, what will be the ratio of the currents flowing in A and B?

□□A stream of electrons moving through a conductor constitutes an electric current. Conventionally, the direction of current is taken opposite to the direction of flow of electrons.

□□The SI unit of electric current is ampere.

□□To set the electrons in motion in an electric circuit, we use a cell or a battery. A cell generates a potential difference across its terminals. It is measured in volts (V).

□□Resistance is a property that resists the flow of electrons in a conductor. It controls the magnitude of the current. The SI unit of resistance is ohm (Ω).

□□Ohm's law: The potential difference across the ends of a resistor is directly proportional to the current through it, provided its temperature remains the same.

□□The resistance of a conductor depends directly on its length, inversely on its area of cross-section, and also on the material of the conductor.

□□The equivalent resistance of several resistors in series is equal to the sum of their individual resistances.

□□The electrical energy dissipated in a resistor is given by $W = V \square\square I \square\square t$

□□The unit of power is watt (W). One watt of power is consumed when 1 A of current flows at a potential difference of 1 V.

□□The commercial unit of electrical energy is kilowatt hour (kWh). 1 kW h = 3,600,000 J = 3.6 □□10^6 J.