

10th CBSE Formative Assessment Test Paper -Chapter Electricity

Very short answer type questions.

(1 mark)

1. What is the SI unit of electric potential?
2. What is meant by the statement, 'Potential difference between points A and B in an electric field is 1 volt'.
3. Name a metal which offers higher resistance to the passage of electricity other than copper.
4. Why is tungsten metal selected for making filaments of incandescent lamp bulbs?
5. Should the heating element of an electric iron be made of iron, silver or nichrome wire?
6. Define the term 'resistivity' of a material.
7. Which has greater resistance 1 kW electric heater or a 100 W filament bulb both marked for 220 V?
8. Nichrome and copper wires of same length and same radius are connected in series. Current I is passed through them. Why does the nichrome wire get heated first?
9. A toaster produces more heat than a light bulb when connected in a parallel to the 220 V mains. Which of the two has greater resistance?
10. Two wires, one of magnesium and the other of copper, have equal lengths and resistances. Which one of these wires will be thicker?
11. Define SI unit of electric charge.
12. If a wire is stretched to double its original length without loss of mass, how will the resistivity of the wire be influenced?
13. Is electric potential a scalar or a vector quantity?
14. Which is bigger: a coulomb of charge or the charge on an electron?
15. Which particles constitute an electric current in a metallic conductor?

Short answer type questions.

(3 marks)

1. State Ohm's law. Draw a schematic diagram of the circuit for studying Ohm's law.
2. Express Ohm's law both by a mathematical formula and by a graph line. State SI unit of a. resistance
b. resistivity.
3. Explain what is short circuiting. How does electric fuse prevent electric fire?
4. Derive an expression for the equivalent resistance when two resistors of resistance R_1 and R_2 are connected in series.

Numericals

1. How much work is done in moving a charge of 4 C across two points having a potential difference 10 V? [Ans. 40 J]
2. How much energy is given to each coulomb of charge passing through a 9 V battery? [Ans. 9 J]
3. 100 joules of work is done in moving a charge of 5 coulombs from one terminal of the battery to another. What is the potential difference of the battery? [Ans. 20 V]
4. If 4×10^{-3} joules of work is done in moving a particle carrying a charge of 16×10^{-6} coulombs from infinity to a point P, what will be the potential at the point P? [Ans. 250 V]
5. Resistance of 8 Ω , 10 Ω and 5 Ω are connected in series. Calculate the equivalent resistance of the circuit. [Ans. 23 Ω]
6. Resistors of 5 Ω , 10 Ω , 15 Ω and 20 Ω are connected in series. Calculate the total resistance of the circuit. [Ans. 50 Ω]
7. Three resistors of 2 Ω , 3 Ω and 15 Ω are connected in parallel. Calculate the total resistance of the circuit. [Ans. 1.11 Ω]
8. Four resistors of 5 Ω , 10 Ω , 15 Ω and 20 Ω are connected in parallel. Calculate the total resistance of the circuit. [Ans. 2.4 Ω]
9. Four resistors are connected in series such that their total resistance is 50 Ω . If the resistance of three resistors is 5 Ω , 10 Ω and 15 Ω respectively, find the resistance of the fourth resistor. [Ans. 20 Ω]
10. Three resistors are connected in parallel such that their total resistance is 3 Ω . If the resistance of two resistors is 10 Ω and 30 Ω respectively, find the resistance of the third resistor. [Ans. 5 Ω]