

Board – ICSE

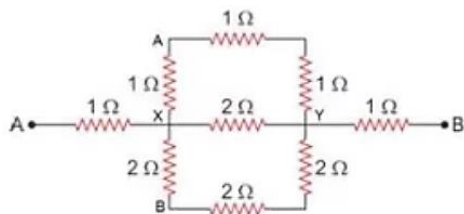
Class – 10<sup>th</sup>

Topic – Current electricity

Max. Marks – 40

Time – 1.5 Hrs.

1. What are Ohmic and Non – Ohmic conductors? Draw a V – I and I – V graph for an Ohmic and Non – Ohmic conductor. [3]
2. Calculate the equivalent resistance between the points A and B [2]



3. Two wires of same material and same length have radii  $r_1$  and  $r_2$ . Compare their resistances and resistivity. [2]
4. A wire of 3 ohm and 10 cm is stretched to 30 cm. Find its new resistance. [2]
5. Define Electro-motive force. State the factors affecting emf. Write its mathematical expression and S.I unit. [2]
6. Write a mathematical relation relating emf, terminal voltage and potential drop. [2]
7. Define internal resistance of a cell. State and explain the factors effecting the internal resistance of a cell. [2]
8. For combination of resistances in series derive the following -  $R_p = R_1 + R_2$  [2]
9. For combination of resistances in parallel derive the following -  $1/R_p = 1/R_1 + 1/R_2$  [2]
10. A cell of emf 1.5 V and internal resistance 10 ohms is connected to a resistor of 5 ohms, with an ammeter in series. What is the reading in the ammeter? [2]
11. Four cells, each of emf 1.5 V and internal resistance 2 ohms are connected in parallel. The battery of cells is connected to an external resistance of 2.5 ohms. Calculate :
  - (i) the total resistance of the circuit
  - (ii) The current flowing in the external circuit
  - (iii) The potential drop across the terminals of the cells. [2]
12. State any 3 factors affecting resistance of a conductor [2]
13. Name two substances whose resistance
  - (i) increases,
  - (ii) decreases,
  - (iii) remains same; when they are heated. [2]

14. A wire is stretched to four times its original length. Find its new resistance. [2]
15. Write the conditions under which emf and terminal voltage of a cell are same. [2]
16. Write two characteristics each of series and parallel connections. [2]
17. Four resistance of 2 ohm each are joined end to end to form a square ABCD. Calculate  
The equivalent resistance of the combination between any two adjacent corners. [2]