

Short Answer Type Questions

1. A child has drawn the electric circuit to study Ohm's law as shown in Figure 12.6. His teacher told that the circuit diagram needs correction. Study the circuit diagram and redraw it after making all corrections

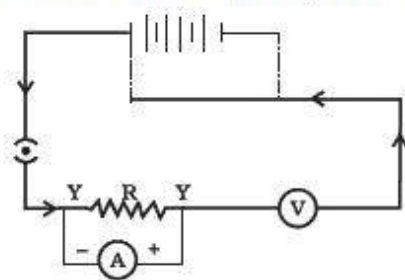


Fig. 12.6

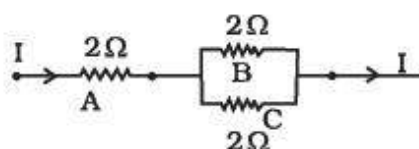


Fig. 12.7

2. Three $2\ \Omega$ resistors, A, B and C, are connected as shown in Figure 12.7. Each of them dissipates energy and can withstand a maximum power of 18W without melting. Find the maximum current that can flow through the three resistors?
3. Should the resistance of an ammeter be low or high? Give reason.
4. Draw a circuit diagram of an electric circuit containing a cell, a key, an ammeter, a resistor of $2\ \Omega$ in series with a combination of two resistors ($4\ \Omega$ each) in parallel and a voltmeter across the parallel combination. Will the potential difference across the $2\ \Omega$ resistor be the same as that across the parallel combination of $4\ \Omega$ resistors? Give reason.
5. How does use of a fuse wire protect electrical appliances?
6. What is electrical resistivity? In a series electrical circuit comprising a resistor made up of a metallic wire, the ammeter reads $5\ \text{A}$. The reading of the ammeter decreases to half when the length of the wire is doubled. Why?
7. What is the commercial unit of electrical energy? Represent it in terms of joules.

8. A current of 1 ampere flows in a series circuit containing an electric lamp and a conductor of $5\ \Omega$ when connected to a 10 V battery. Calculate the resistance of the electric lamp. Now if a resistance of $10\ \Omega$ is connected in parallel with this series combination, what change (if any) in current flowing through $5\ \Omega$ conductor and potential difference across the lamp will take place? Give reason.
9. Why is parallel arrangement used in domestic wiring?
10. B_1 , B_2 and B_3 are three identical bulbs connected as shown in Figure 12.8. When all the three bulbs glow, a current of 3A is recorded by the ammeter A.

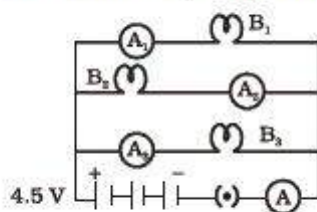


Fig. 12.8

- (i) What happens to the glow of the other two bulbs when the bulb B_1 gets fused?
- (ii) What happens to the reading of A_1 , A_2 , A_3 and A when the bulb B_2 gets fused?
- (iii) How much power is dissipated in the circuit when all the three bulbs glow together?

Long Answer Type Questions

1. Three incandescent bulbs of 100 W each are connected in series in an electric circuit. In another circuit another set of three bulbs of the same wattage are connected in parallel to the same source.
 - (a) Will the bulb in the two circuits glow with the same brightness? Justify your answer.
 - (b) Now let one bulb in both the circuits get fused. Will the rest of the bulbs continue to glow in each circuit? Give reason.
2. State Ohm's law? How can it be verified experimentally? Does it hold good under all conditions? Comment.
3. What is electrical resistivity of a material? What is its unit? Describe an experiment to study

the factors on which the resistance of conducting wire depends.

4. How will you infer with the help of an experiment that the same current flows through every part of the circuit containing three resistances in series connected to a battery?
5. How will you conclude that the same potential difference (voltage) exists across three resistors connected in a parallel arrangement to a battery?
6. What is Joule's heating effect? How can it be demonstrated experimentally? List its four applications in daily life.
7. Find out the following in the electric circuit given in Figure 12.9
 - (a) Effective resistance of two $8\ \Omega$ resistors in the combination
 - (b) Current flowing through $4\ \Omega$ resistor
 - (c) Potential difference across $4\ \Omega$ resistance
 - (d) Power dissipated in $4\ \Omega$ resistor
 - (e) Difference in ammeter readings, if any

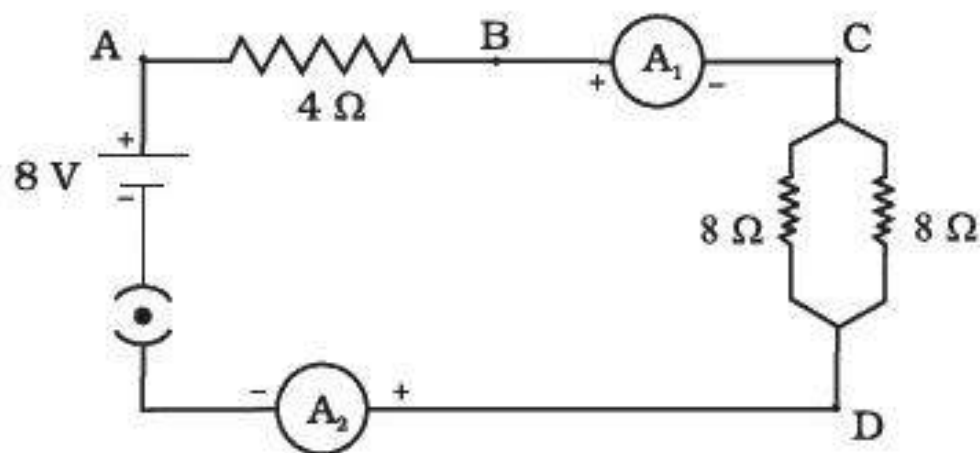


Fig. 12.9