

3

Electricity: Circuits and their Components

Let Us Enhance Our Learning

1. Choose the incorrect statement.

- (i) A switch is the source of electric current in a circuit.
- (ii) A switch helps to complete or break the circuit.
- (iii) A switch helps us to use electricity as per our requirement.
- (iv) When the switch is in 'OFF' position, there is an air gap between its terminals.

2. Observe Fig. 3.16. With which material connected between the ends A and B, the lamp will not glow?

Ans: With the use of insulation material like wood or plastic the lamp will not glow.

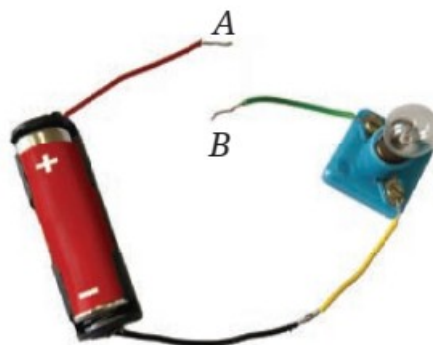


Fig. 3.16

3. In Fig. 3.17, if the filament of one of the lamps is broken, will the other glow? Justify your answer.

Ans: No, the lamp will not glow as the circuit is not completed due to one of the broken lamps.

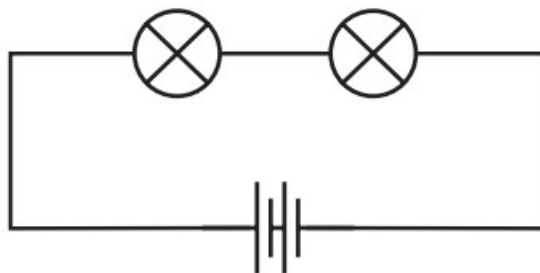


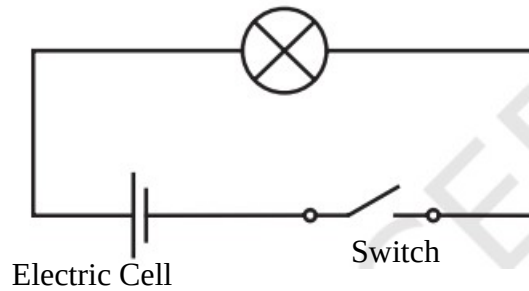
Fig. 3.17

4. A student forgot to remove the insulator covering from the connecting wires while making a circuit. If the lamp and the cell are working properly, will the lamp glow?

Ans: No, the lamp will not glow.

5. Draw a circuit diagram for a simple torch using symbols for electric components.

Ans:



6. In Fig. 3.18:

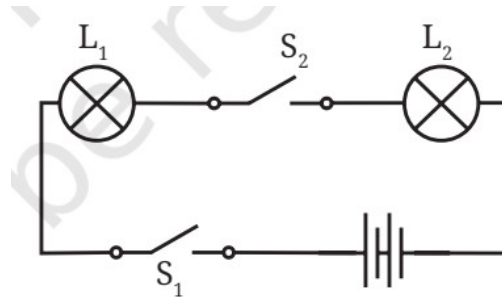


Fig. 3.18

- (i) If S₂ is in 'ON' position, S₁ is in 'OFF' position, which lamp(s) will glow? **No Lamp will glow**
- (ii) If S₂ is in 'OFF' position, S₁ is in 'ON' position, which lamp(s) will glow? **No Lamp will glow**
- (iii) If S₁ and S₂ both are in 'ON' position, which lamp(s) will glow? **Both Lamp will glow**
- (iv) If both S₁ and S₂ are in 'OFF' position, which lamp(s) will glow? **No Lamp will glow**

7. Vidyut has made the circuit as shown in Fig. 3.19. Even after closing the circuit, the lamp does not glow. What can be the possible reasons? List as many possible reasons as you can for this faulty operation. What will you do to find out why the lamp did not glow?

Ans: Possible Reasons Why the Lamp Does Not Glow:

- Electric cell is not working (discharged or dead).
- Cells are not connected properly in the correct order (positive to negative terminal).
- Loose connections between wires, terminals, or components.
- Connecting wires are broken or have insulation not removed at the ends.
- The lamp is fused (filament may be broken).

I will check the above reasons and will correct it.



Fig. 3.19

8. In Fig. 3.20, in which case(s) the lamp will not glow when the switch is closed?

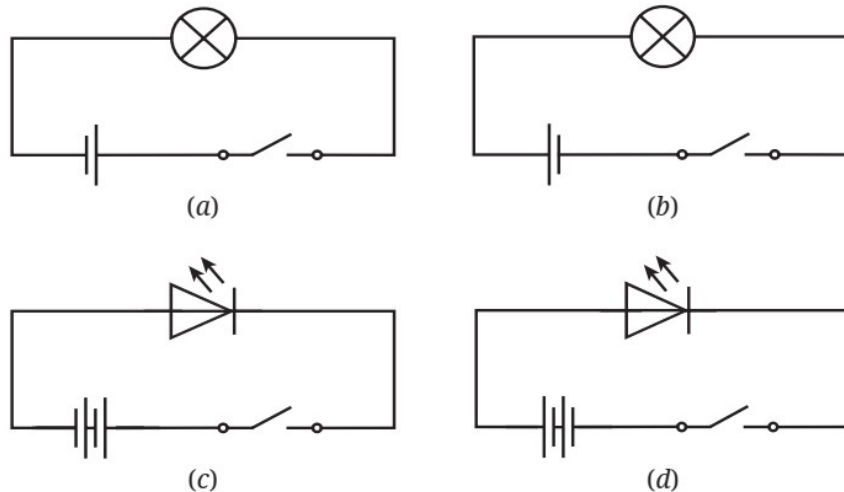


Fig. 3.20

Ans: In case (c) the lamp will not glow as the electric cell is not in correct order. For LED the positive and negative should be in correct order.

9. Suppose the '+' and '-' symbols cannot be read on a battery. Suggest a method to identify the two terminals of this battery.

Ans:

Observe the Physical Features

- Positive terminal (+): Usually has a small raised metal cap.
- Negative terminal (-): Usually has a flat base.

Use a Simple LED Circuit to Test

- LED only allows current in one direction, so it's a reliable polarity tester.
- If the LED glows, then the terminal connected to the longer leg of the LED is the positive terminal.

10. You are given six cells marked A, B, C, D, E, and F. Some of these are working and some are not. Design an activity to identify which of them are working.

(i) List the items that you require.

Ans: Items Required:

- Electric lamp (a small torch bulb or LED)
- Two wires with insulation removed at both ends
- A lamp holder (optional)
- Tape (if holders are not available)
- The six cells marked A, B, C, D, E, and F

(ii) Write the procedure that you will follow.

Ans: Procedure:

Set up a simple circuit:

- Connect one wire to the base terminal of the lamp and another wire to the side terminal (if using a bulb).
- If using an LED, connect wires to the long and short legs (long = positive, short = negative).

Test each cell individually:

- Connect one end of the lamp wire to one terminal of the cell and the other end to the other terminal.
- For an LED, make sure the positive terminal of the cell is connected to the longer leg of the LED.

(iii) With the items, carry out the activity to identify the cells that are working.

Ans: Observe whether the lamp or LED glows:

If it glows, the cell is working.

If it does not glow, the cell may be dead or weak.

Repeat the test for each of the six cells (A–F), one at a time.

11. An LED requires two cells in series to glow. Tanya made the circuit as shown in Fig. 3.21. Will the lamp glow? If not, draw the wires for correct connections.

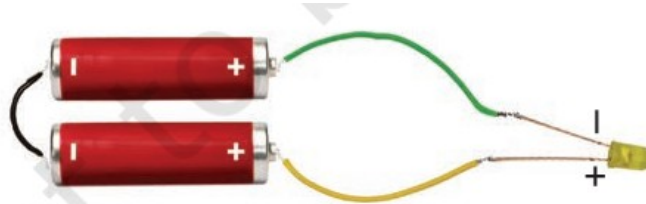


Fig. 3.21

Ans: No, the lamp will not glow as the battery terminals are not proper.

