

NCERT QUESTIONS WITH SOLUTIONS

1. Choose the incorrect statement.

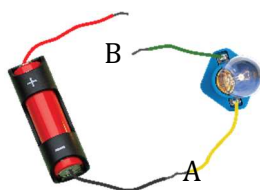
- (1) A switch is the source of electric current in a circuit.
- (2) A switch helps to complete or break the circuit.
- (3) A switch helps us to use electricity as per our requirement.
- (4) When the switch is in 'OFF' position, there is an air gap between its terminals.

Solution

Option (1)

A switch is not a source of electric current. Its purpose is to control the flow of current. The source of electric current in a circuit is a component like a battery, a cell, or a generator.

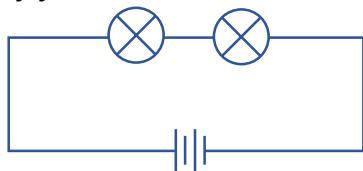
2. Observe figure with which material connected between the ends A and B, the lamp will not glow?



Solution

Lamp will not glow if material like glass, wood, plastic, rubber is connected between the ends A and B in given circuit.

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



Solution

In the given circuit, if the filament of one of the lamps is broken, the other lamp will not glow, as both lamps are connected in series. If one is not working, it breaks the circuit.

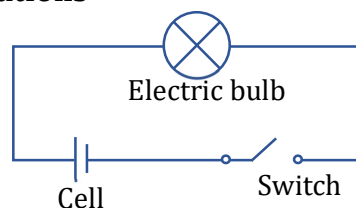
4. A student forgot to remove the insulator covering from the connecting wires while making a circuit. If the lamp and the cell are working properly, will the lamp glow?

Solution

No, the lamp will not glow. Even if the lamp and the cell are working properly, the circuit will not be complete because the insulating covering prevents electrical contact between the wires and the components. For current to flow, the conductive part of the wires must be in contact with the terminals of the cell and the lamp.

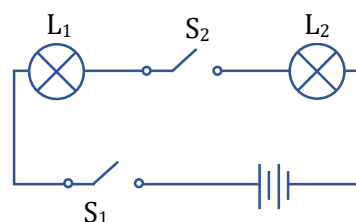
5. Draw a circuit diagram for a simple torch using symbols for electric components.

Solutions



6. In Figure:

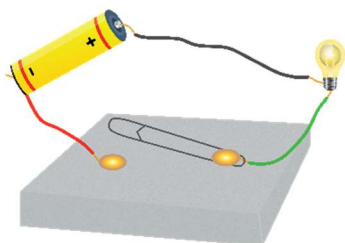
- (i) If S_2 is in 'ON' position, S_1 is in 'OFF' position, which lamp(s) will glow?
- (ii) If S_2 is in 'OFF' position, S_1 is in 'ON' position, which lamp(s) will glow?
- (iii) If S_1 and S_2 both are in 'ON' position, which lamp(s)



Solution

- (i) If S_2 is in 'ON' position, S_1 is in 'OFF' position, no lamp(s) will glow as circuit will remain open.
- (ii) If S_2 is in 'OFF' position, S_1 is in 'ON' position, no lamp(s) will glow as circuit will remain open.
- (iii) If S_1 and S_2 both are in 'ON' position, both lamps will work as circuit is complete.

7. Vidyut has made the circuit as shown in Fig. 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?



Solutions

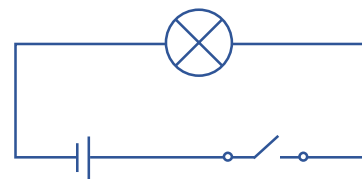
There are several possible reasons why the lamp in Vidyut's circuit might not be glowing, even after the circuit is closed:

Possible Reasons for the Lamp Not Glowing

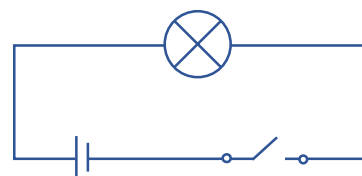
Possible Reasons for the Lamp Not Glowing

- (i) The most common reason is that the bulb itself is broken. The filament inside the bulb might be burnt out, preventing the flow of electricity.
- (ii) The battery or cell that powers the circuit may be completely discharged and no longer has enough chemical energy to produce a current.
- (iii) The wires might not be securely connected to the terminals of the battery, the switch, or the lamp holder. A loose connection creates an air gap, which acts as an insulator, breaking the circuit.
- (iv) One of the wires in the circuit could be broken internally, even if the insulation appears intact. This would create an open circuit.
- (v) There might be an insulating material, such as a piece of plastic or rubber, inadvertently placed in the circuit, which is preventing the flow of current.

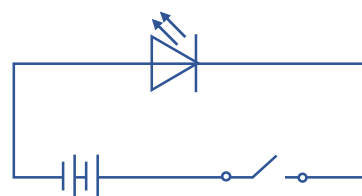
8. In figure, in which case(s) the lamp will not glow when the switch is closed?



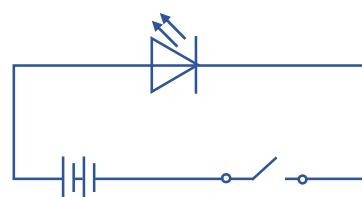
(1)



(2)



(3)



(4)

Option (3)

Solution

The terminals of a lamp can be connected to the terminals of a cell in any order. However, the terminals of an LED have clear indications: the positive terminal of the LED must be attached to the positive terminal of the cell, and the negative terminal of the LED must be attached to the negative terminal of the cell.

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

Solution

If the '+' (positive) and '-' (negative) symbols cannot be read on a battery, you can identify the terminals using the following method:

- (i) Connect one wire to one terminal of the battery.
- (ii) Touch the other end of that wire to one terminal of the LED.
- (iii) Use a second wire to connect the other battery terminal to the second terminal of the LED.
- (iv) Observe the LED. If it glows, then the positive terminal of the LED is connected to the positive terminal of the battery, and the negative terminal of the LED is connected to the negative terminal of the battery. Thus, by observing the LED, the battery terminals can be identified.
- (v) If the LED does not glow, then swap the connections between the battery and the LED.

- 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.
- (ii) Write the procedure that you will follow.
- (iii) With the items, carry out the activity to identify the cells that are working.

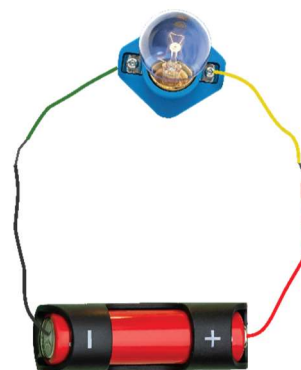
Solution

- (i) Items Required

- (a) Six cells: A, B, C, D, E, F
- (b) A working lamp or an LED
- (c) Two pieces of insulated wire
- (d) A simple switch

- (ii) Procedure

- (a) Use the lamp and the two wires to create a simple series circuit. Connect one end of a wire to the positive terminal of the lamp holder and the other end to the switch (if using). Connect the second wire to the negative terminal of the lamp holder.
 - (b) Before testing the unknown cells, confirm your lamp and wires are working correctly by connecting them to a new, known working cell. The lamp should glow. If it doesn't, check your lamp or wires and fix the issue.
 - (c) Take one of the cells (e.g., cell A) and place it in the circuit. Connect the free end of the wire from the switch to the positive terminal of the cell and the free end of the second wire to the negative terminal of the cell.
 - (d) Observe whether the lamp glows or not.
 - (e) Record your observation. If the lamp glows, cell A is working. If it doesn't, cell A is not working.
- 6.** Repeat steps 3, 4, and 5 for each of the remaining cells (B, C, D, E, and F), one at a time.



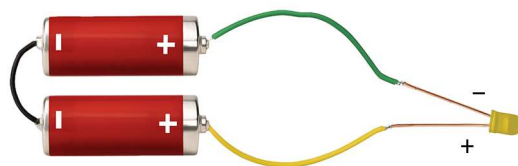
Carry Out the Activity

To perform the activity, you will systematically test each cell.

- (i) Connect cell A to the circuit. Observe the lamp is glowing or not. If glows Cell A is working, if not Cell A is not working.
- (ii) Connect cell B to the circuit. Observe the lamp is glowing or not. If glows Cell B is working, if not Cell B is not working.
- (iii) Connect cell C to the circuit. Observe the lamp is glowing or not. If glows Cell C is working, if not Cell C is not working.
- (iv) Connect cell D to the circuit. Observe the lamp is glowing or not. If glows Cell D is working, if not Cell D is not working.
- (v) Connect cell E to the circuit. Observe the lamp is glowing or not. If glows Cell E is working, if not Cell E is not working.
- (vi) Connect cell F to the circuit. Observe the lamp is glowing or not. If glows Cell F is working, if not Cell F is not working.

Testing all six cells, you will have a complete list of which cells are working and which are not based on whether they can power the lamp.

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



Solution

No, the lamp will not glow as the negative terminal of LED is connected to the positive terminal of cell and negative terminal of cell should be connected to the positive terminal of other cell.

