



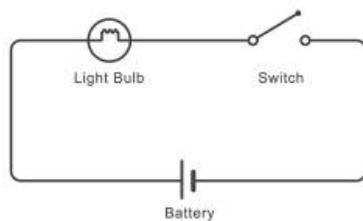
Class: VII	DEPARTMENT: SCIENCE 2025-26	DATE: 03-02-2026
WORKSHEET NO: 13 WITH ANSWERS	TOPIC: ELECTRICITY: CIRCUITS AND THEIR COMPONENTS	NOTE: A4 FILE FORMAT
NAME OF THE STUDENT:	CLASS & SEC:	ROLL NO.

I. OBJECTIVE-TYPE QUESTIONS (1M):

1. In a torch, the lamp glows only when the cells are placed:

- (a) Randomly.
- (b) With all positive terminals together.
- (c) With all negative terminals together.
- (d) With the positive terminal of one connected to the negative of the next cell.

2. A student connects a bulb, a switch, and a cell as shown below. The bulb does not glow even when the switch is ON. Which of the following could be a possible reason?



- (a) The switch is connected in parallel.
- (b) The bulb filament is broken.
- (c) The connecting wires are short.
- (d) The cell is placed inside the bulb.

3. Two circuits are made using identical bulbs and cells. In Circuit A, copper wires are used, while in Circuit B, plastic-coated wires are used without removing the insulation at the ends. What will be observed?

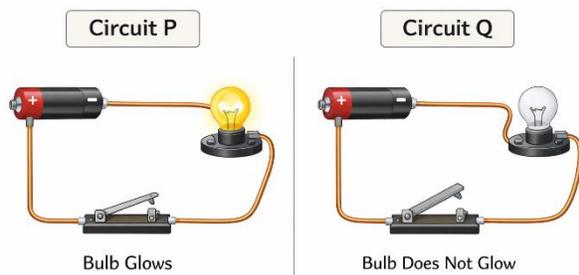
- (a) Bulbs glow in both circuits.
- (b) Bulbs do not glow in either circuit.

- (c) Bulb glows only in Circuit A.
- (d) Bulb glows only in Circuit B.

4. A switch is mistakenly placed in such a way that it does not break the circuit when turned OFF. What is the main disadvantage of this arrangement?

- (a) The bulb will glow brighter.
- (b) The circuit becomes short-circuited.
- (c) Electricity will flow continuously.
- (d) The cell will change polarity.

5. Two circuits, P and Q, are shown below. In circuit P, the bulb glows, but in circuit Q it does not. What could be the most probable reason?



- (a) Circuit Q has a switch.
- (b) Circuit Q is an open circuit.
- (c) Circuit Q uses copper wires.
- (d) Circuit Q has a longer wire.

6. Which of the following is TRUE about LEDs?

- (a) They have a filament.
- (b) They glow by heating a wire.
- (c) They have two terminals of unequal wire length.
- (d) They work only with an AC supply.

7. Which of the following correctly explains why rubber is used to cover electric wires?

- (a) Rubber is an insulator and prevents electric shock.
- (b) Rubber increases electric current.
- (c) Rubber is shiny and attractive.
- (d) Rubber is a good conductor.

For the following questions, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii), and (iv) as given below:

(i) Both A and R are true, and R is the correct explanation of the assertion.

(ii) Both A and R are true, but R is not the correct explanation of the assertion.

(iii) A is true, but R is false.

(iv) A is false, but R is true.

8. **Assertion (A):** In a closed circuit, a bulb glows.

Reason (R): A closed circuit provides a complete path for the flow of electric current.

9. **Assertion (A):** Replacing a copper wire with a plastic wire will not affect the working of a circuit.

Reason (R): Plastic is an insulator and does not allow an electric current to pass through it.

10. **Assertion (A):** An LED has two terminals, one of which is positive and the other is negative.

Reason (R): The current passes through the LED only when the longer wire of the LED is connected to the negative terminal of the battery.

II. VERY SHORT ANSWER TYPE QUESTIONS (2M):

1. Define a circuit.

[Hint: A circuit is a closed path through which electric current flows from a source to an electrical device and back to the source.]

2. Name the components of a simple electric circuit.

[Hint: Cell or Battery (source of electric current), Bulb, Switch (to control the circuit), and Connecting wires]

3. What is the function of a switch in a circuit?

[Hint: A switch is used to complete (ON) or break (OFF) the circuit, thereby controlling the flow of electric current.]

4. Why does a bulb not glow if one wire in a circuit is disconnected?

[Hint: Disconnecting a wire breaks the circuit, so electric current cannot flow continuously, and the bulb does not glow.]

5. What is a battery?

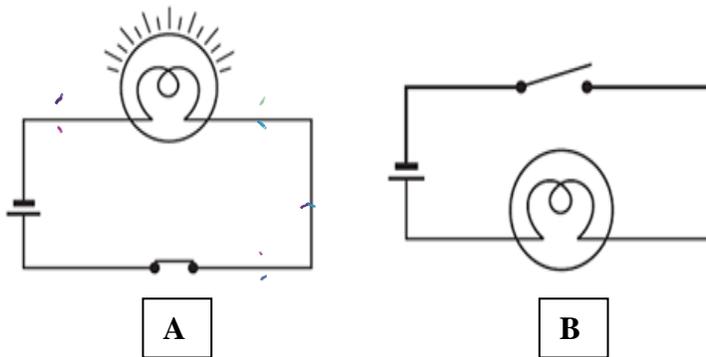
[Hint: A battery is a combination of two or more cells. In a battery, the negative terminal of one cell is connected to the positive terminal of the next cell.]

6. What is a circuit diagram?

[Hint: A representation of an electrical circuit using symbols is called its circuit diagram.]

III. SHORT ANSWER TYPE QUESTIONS: (3M)

1. Identify the types of circuits shown below and write the difference between them



[Hint: **A: Closed circuit:** When the switch is in the 'ON' position, the circuit from the positive terminal of the battery to the negative terminal is complete. This circuit is said to be closed. **B: Open circuit:** When the switch is in the 'OFF' position, the circuit is incomplete. It is said to be open.]

2. Draw the circuit symbols for:

[Hint:

a) A cell



b) A battery of two cells



c) Switch in the OFF position



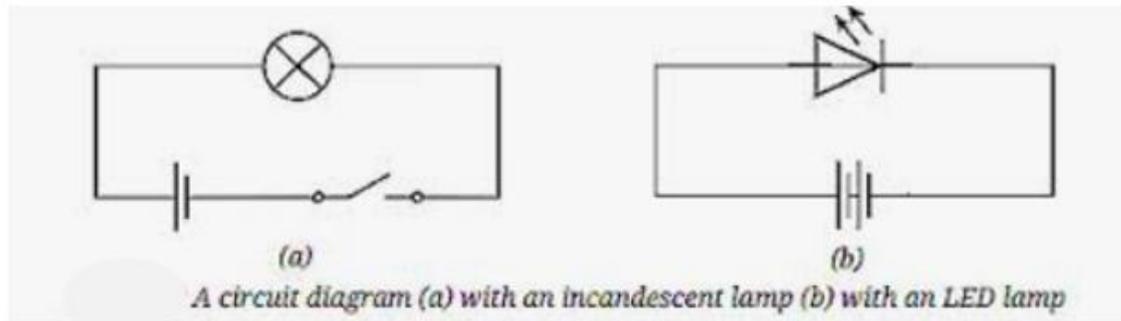
d) Light Emitting Diode (LED)



e) Electric lamp ]

3. Draw neat and well-labelled circuit diagrams using appropriate electrical symbols to show:
(i) an electrical circuit with an incandescent lamp in the OFF position, and
(ii) an electrical circuit with an LED lamp glowing.

[Hint:



4. What precautions should be taken while making an electric circuit?

[Hint: Ensure wires are properly connected, and insulation is removed.

Do not touch bare wires when the circuit is on.

Use proper switches to control current.

Use dry hands (with gloves) to prevent electric shock.]

5. Differentiate between an LED and an incandescent electric lamp?

[Hint: An LED has two terminals, one is positive (the longer wire), and the other is negative (the shorter wire). An LED conducts current in only one direction.

In an incandescent electric lamp, there is a thin wire called the filament, which gets hot and glows to produce light when an electric current passes through it.

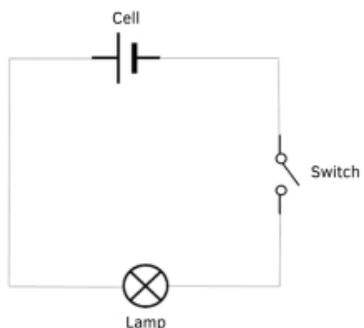
6. What is the difference between a conductor and an insulator? Give examples.

[Hint: **Conductor:** The materials which allow electric current to flow through them are called conductors or good conductors of electricity (example: copper wire).

Insulator: The materials which do not allow current to flow through them are called insulators or poor conductors of electricity (example: rubber).]

IV. LONG ANSWER TYPE QUESTIONS. (5M)

1. Draw a safe circuit with a cell, a bulb, and a switch. Label the components and describe the components and the path of the current.



[Hint:

- **Cell: Represents the source of electrical energy in the circuit.**
- **Switch: Used to complete (close) or break (open) the circuit.**
- **Bulb: A device that glows when the circuit is complete; it does not glow when the circuit is incomplete.**

The flow of current is from the positive (+) terminal of the cell, through the switch, through the bulb, and back to the negative (-) terminal.]

V. SOURCE-BASED/ CASE STUDY-BASED QUESTIONS

Rahul observed that some wires in his classroom were without proper insulation. The teacher explained that insulation is important because it prevents electric shocks and ensures that electric current flows only through the wire. The students were also told to never touch bare wires with wet hands because wet hands conduct electricity and increase the risk of getting shocked. We should always use switches to turn circuits on and off because a switch either completes or breaks the circuit, making it safe for us. Rahul decided to make a simple circuit to test a bulb, using a cell, bulb, and switch. He noticed that the bulb glowed and that the current flowed safely because the wires were insulated properly.

i. Why is insulation used on wires?

[Hint: Insulation prevents electric shocks and ensures that electric current flows only through the wire.]

ii. Why should one avoid touching bare wires with wet hands?

[Hint: Wet hands conduct electricity, increasing the risk of electric shock.]

iii. How does a switch help in making circuits safe?

[Hint: A switch allows the user to safely complete or break the circuit without touching wires directly, controlling the flow of electric current.]

ANSWERS FOR OBJECTIVE TYPE QUESTIONS [1 to 10]:

1. (d) With the positive terminal of one connected to the negative of the next cell.
2. (b) The bulb filament is broken.
3. (c) Bulb glows only in Circuit A.
4. (c) Electricity will flow continuously
5. (b) Circuit Q is an open circuit.
6. (c) They have two terminals of unequal wire length.
7. (a) Rubber is an insulator and prevents electric shock.
8. (i) Both A and R are true, and R is the correct explanation of the assertion.
9. (iv) A is false, but R is true.
10. (iii) A is true but R is false.

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