St. Andrews Scots Sr. Sec. School

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Session: 2026 – 2027

(Answer Key)

Class: VII	Subject: Science	Chapter: Electricity- Circuits and their Components

Self-Assessment: **Page No. 31**

Multiple Choice Questions:

1. (c) 2. (d) 3. (c)

Assertion-Reason Based Questions:

1. (b) 2. (a)

Self-Assessment: **Page No. 34**

Multiple Choice Questions:

1. (a) 2. (c)

Assertion-Reason Based Questions:

1. (a) 2. (a)

SECTION-A

A. Oral Questions:

1. A complete circuit is one in which all components are properly connected, allowing electric current to flow from one terminal of the battery to the other.

2. Electric wires have plastic coatings because plastic is an insulator that prevents electric shocks and keeps the current safely inside the wire.

3. If we connect a wire only to one terminal of a bulb, the circuit remains incomplete and the bulb will not glow.

B. Multiple Choice Questions:

1. (c) 2. (c) 3. (d) 4. (d) 5. (c) 6. (a)

C. Case-Based Questions:

Case 1:

1. The bulb didn't glow because one wire was loose and the LED was connected in reverse.
2. Kabir should fix the loose wire properly and connect the LED in the correct direction (positive to positive, negative to negative).
3. An LED works only when current flows in one direction. If connected in the wrong way, current cannot pass through it, so it doesn't glow.

Case 2:

1. The safety pin acted as a switch, completing or breaking the circuit.
2. When the bulb glows, the circuit is said to be a closed circuit.
3. The bulb stopped glowing because the safety pin was moved away, creating an open circuit that stopped the flow of current.

SECTION-B

A. Very Short Answer Questions:

1. The metal tip in a bulb allows electric current to enter the filament from the circuit.
2. Electric kettle and mixer-grinder.
3. An electric cell provides energy or a source of current to the circuit.

B. Short Answer Questions:

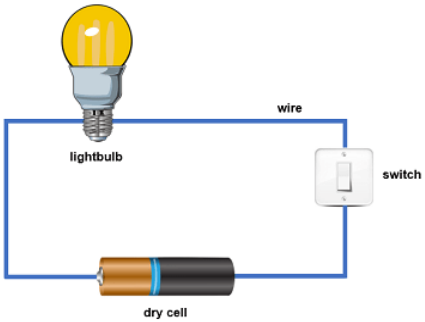
1. A cell is a single unit that provides electricity, while a battery is a group of two or more cells connected together to supply more power.
2. Components must be connected in the correct order so that the current can flow properly through each part; wrong connections can prevent current flow or damage components.
3. A switch helps to open or close a circuit. When it is on, current flows and the device works; when off, the circuit is open and current stops.

C. Long Answer Questions:

1. Setting up a simple circuit:

Steps:

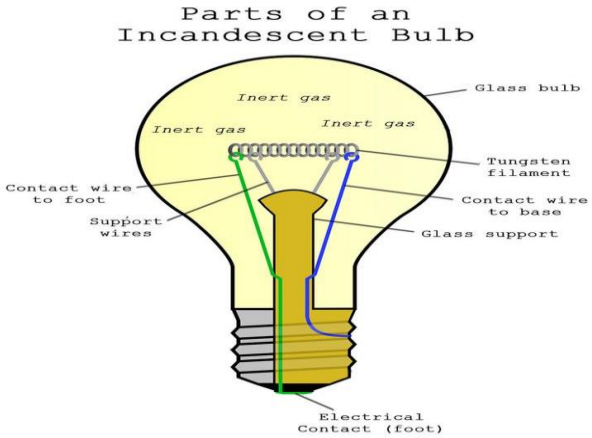
(a) Connect one end of a wire to the positive terminal of a cell.
(b) Attach the other end to the metal tip of a bulb.
(c) Connect a second wire from the metal case of the bulb to the negative terminal of the cell.
(d) The bulb glows when the circuit is complete.



Safety Tip: Always use insulated wires, ensure connections are tight and avoid touching metal parts when the circuit is on.

2. **Structure and working of an incandescent bulb:**

(a) It has a glass bulb, tungsten filament, metal tip and metal casing.
(b) When electric current passes through the filament, it heats up and glows, producing light.
(c) The air inside the bulb is replaced with an inert gas to prevent the filament from burning out.



3. Comparison between Incandescent Lamp and LED:

Feature	Incandescent Lamp	LED
Working	Glows by heating a filament	Glows by movement of electrons in a semiconductor
Energy Use	Wastes energy as heat	Uses less energy
Lifespan	Short	Long
Heat Produced	High	Very low

LEDs are better because they consume less power, produce less heat and last much longer than incandescent bulbs.

4. The bulb does not glow because in set-up A, the circuit is incomplete — the connection between points A and B is not made properly. In set-up B, an eraser (a non-conductor) is used between A and B, which prevents current from flowing.

To make the circuit complete, the student should:

(a) Connect a conducting wire between points A and B instead of the eraser.

(b) Ensure all wires are tightly connected to the bulb holder and cell terminals.

When the conducting path is complete, electric current will flow and the bulb will glow.

D. Application-Based Questions:

1. Some of Saira's LED lights may not work because LEDs have polarity and glow only when connected in the right way. Some lights might be connected in reverse or have loose connections.

2. Arnav's toy car didn't run because the battery was placed incorrectly, reversing the current direction. The motor could not work until the battery was placed with the correct positive and negative terminals.

E. Picture-Based Questions:

(a) The symbol represents a battery or a cell combination.

(b) When connected in a working circuit, it provides electrical energy that makes current flow.

(a) Labels:
Bulb: Front part of the torch.
Switch: Red button on top.
Cells: Two cylindrical batteries inside the torch.

(b) The switch helps complete or break the circuit, allowing the current to flow when pressed on.