

St. Andrews Scots Sr. Sec. School

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Session: 2025 – 2026

(Answer Key)

Class: VII

Subject: Science

Chapter: Electric Current and Its Effects

CHECKPOINT 1

- | | | | |
|---------------------|--------------------|-----------------|------------------|
| 1. Electric current | 2. Cell or Battery | 3. Open circuit | 4. Straight line |
| 5. Closed key | 6. Conductor | | |

CHECKPOINT 2

- | | | | | |
|------------|-------------|---------------|-------------|------------------|
| 1. Heating | 2. Filament | 3. Resistance | 4. Nichrome | 5. Electric fuse |
|------------|-------------|---------------|-------------|------------------|

CHECKPOINT 3

- | | | | | |
|--------|--------|--------|-------|--------|
| 1. (T) | 2. (F) | 3. (F) | 4.(T) | 5. (T) |
|--------|--------|--------|-------|--------|

PRACTICE TIME

- A. 1. (c) 2. (c) 3. (d) 4. (b) 5. (a) 6. (c) 7. (a)

- B. 1. (b) 2. (b) 3. (d) 4. (a)

- C. 1. Positive, negative 2. battery 3. tungsten 4. nichrome 5. copper 6. temporary

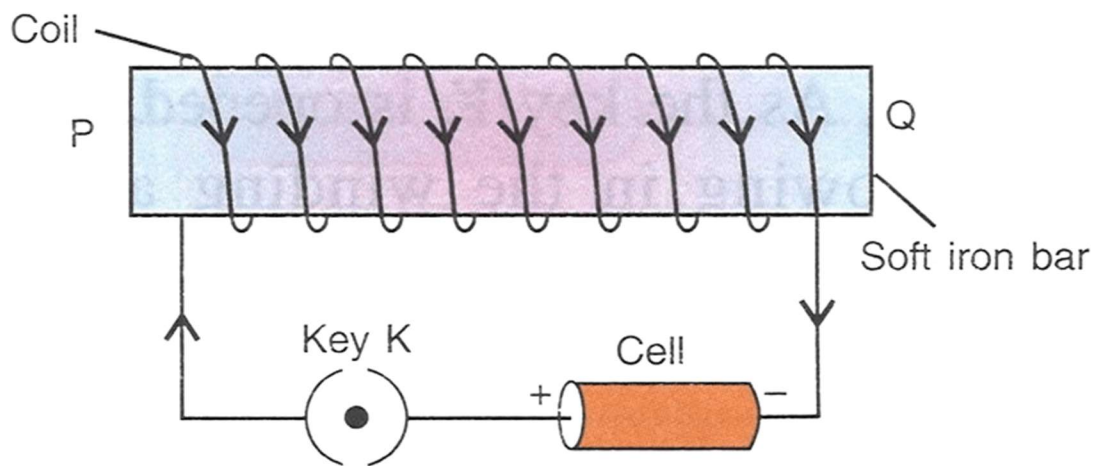
- D. 1. Electric bulb
2. Battery
3. Fuse / MCB
4. Ammeter
5. Electromagnet

- E. 1. The nail is wrapped with a wire which forms a solenoid. When current is flown through it, it starts acting as an electromagnet. Hence, iron pins get attracted towards it.

2. Electromagnet is a soft iron bar wrapped around by a coil of conducting wire which behaves as a magnet on passing electric current through it.

Uses of electromagnet:

- To separate iron scrap from the junk in industries.
- Doctors use very small but strong electromagnets to remove iron dust from a patient's eyes.
- In electric motors and receivers of telephones.
- In picture tubes of television and computer screens. They help in the formation of image on the screen.
- A number of electromagnets are used in a car which help in moving of different parts and generate Electricity as well.



3. The amount of heat produced by the current-carrying conductor is affected by the following factors:
- The material of the conductor.
 - The length of conductor.
 - The thickness of conductor.
 - The time for which the current flows.
4. The Bureau of Indian Standards is an authority who tests/marks the electrical devices/appliances and gives its marking known as ISI mark for superior quality. This mark has a great importance because it ensures the safety and energy saving by the device.
5. The strength of an electromagnet can be increased by increasing:
- The amount of current flowing through the coil.
 - The number of turns of copper wire in the coil.

- F. 1. When amount of current is increased through a conductor, it produces more heat. This fact can be shown experimentally as follows:

Procedure: Make 3 circuits to glow a bulb, one with a single cell, the second with two cells and the third with three cells. Switch each circuit 'on' for two minutes and then switch it 'off'. Touch and feel the glass of the bulb in each circuit.

Observation and Conclusion: The bulb in the second circuit is hotter than that in the first circuit while the bulb in the third circuit is the hottest. It is because on increasing the number of cells in the respective circuits, the amount of current passing through them is increased. Therefore, more is the current flowing through a material, larger is the heat generated.

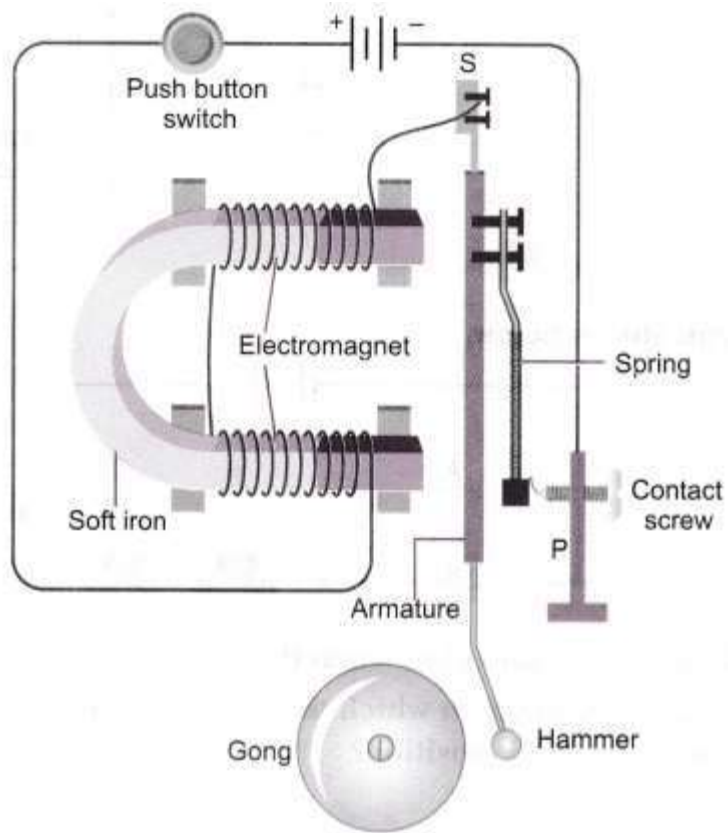
2. A fuse is a safety device which limits the current in an electric circuit. If the current in a circuit exceeds a specified value, the fuse wire melts and breaks the circuit.

When a circuit gets overheated due to overloading, the fuse melts a little before any other part of the circuit melts. This stops the flow of current, and further heating and burning of the circuit is prevented.

3. **Structure of Electric Bell:** An electric bell is made up of the following components.
- **Electromagnet:** There is a U-shaped electromagnet. It is magnetized when the push button of the cell is pressed.
 - **Armature:** It is a soft iron strip which is attracted by the electromagnet, when it is magnetized.
 - **Hammer:** It is a small metallic sphere which is made of steel. It is attached to the armature at its one end with the help of a soft, springy thin piece of metal. The hammer strikes with the gong to produce sound.
 - **Gong:** It is a big metallic hemisphere, to which the hammer strikes to produce sound.
 - **Contact screw:** It is a make and break screw which is adjustable. It is used to adjust the contact between the armature and the push button of the bell to produce best sound. It can change the frequency of the ringing bell.

Working of an Electric Bell:

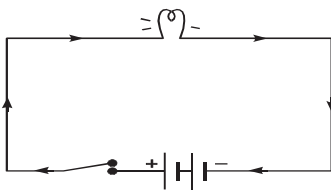
- The terminals T1 and T2 are connected to a battery through a push button switch. When the switch is pushed 'on' the current flows through the electromagnet and contact screw. As a result, the Electromagnet is magnetized and attracts the armature.
 - The hammer connected at the end of armature moves to hit the gong and produces a sound. This time, the contact between the contact spring and contact screw breaks. As the circuit breaks, the electromagnet gets demagnetised.
 - The coil is no longer a magnet. The armature moves back. The circuit is made again and as a result, The above steps are repeated.
- The bell goes on ringing, until the push button is released.



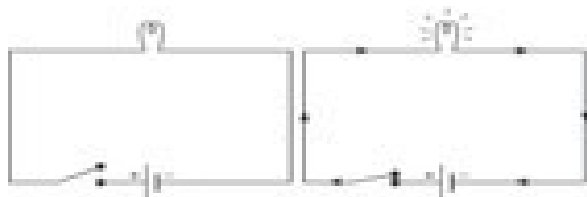
Electric Bell

4. i. (c) This electromagnet consists of maximum number of turns in the coil and a battery of three cells. Hence, its magnetic field is of the greatest strength.
- ii. (a) +ve terminal is longer than -ve one.
- iii. (c) Circuit is complete with closed switch.

5.



6



Open Circuit

Closed Circuit

- G.** 1. Besides giving light, an electric bulb also gives out heat which is not desirable because it consumes more electricity and causes wastage of it. However, using fluorescent tubes and compact fluorescent lamps (CFLs) is a better option as they produce light by using very small amount of electricity. Hence, they save energy and produce better quality of light.
2. The fuse wire is made of tin or alloy of tin and copper because these materials have a melting point lower than that of normal connecting wires and devices. This helps melt the fuse wire before any other component and saves them from burning.
3. Electric iron, toaster, geyser, room heater, bulb, fuse, MCB, etc. use heating effect of electric current. In some appliances, heat produced due to flow of current is waste. For example, electric bulb, mixer and grinder, air conditioner, refrigerator, etc.

Passage/Case-based Questions

1. Rubber is a bad conductor or insulator of electricity. Hence, it does not allow electric current to pass to our body and prevents electric shock.
2. An electrician is a person who repairs electric wiring, fitting and equipment.