



Class - VII January Month Class Work Notes

14. Electric current and its Effects

Technical Words:

1. **Circuit** - the closed path through which electric current flows
2. **Electric fuse** - a device that prevents the flow of large amount of electric current to flow through a circuit by breaking the circuit
3. **Miniature circuit breaker** - a switch connected to the mains electricity supply that automatically turns off and breaks the circuit when the current passing through the circuit goes beyond the safety limit.
4. **Electromagnet** - a piece of soft iron with an insulated wire coiled around it that acts like a magnet when electric current flows through the wire.

A. Answer the question.

Short answer question

1. Define an electric circuit.

[Answer] An electric circuit is a closed conducting path through which electric current can flow.

2. If you have diagram of an electric circuit how will know if electricity will flow through it or not?

[Answer] Electricity will flow through the circuit if it forms a closed continuous path from the battery, through the components and back to the battery. The diagram has to show a closed circuit.

3. What are the disadvantages of the heating effect of current?

[Answer] The heating effect of current leads to energy loss, as electrical energy is converted into heat. Excessive heating can damage electrical appliances and may lead to a risk of electric fire.

4. What is a fuse? How does it work?

[Answer] A fuse is a safety device used in electrical circuits to protect appliances from damage due to excessive electric current. It consists of a wire made of material with a low melting point. When the current exceeds the safety limit, the fuse wire gets heated and melts, breaking the circuit and thus ensuring safety.

5. Define a solenoid. How is it useful?

[Answer] A solenoid is a coil of wire wound on an iron core. Solenoids are commonly used in devices such as doorbells and in the construction of electromagnets.

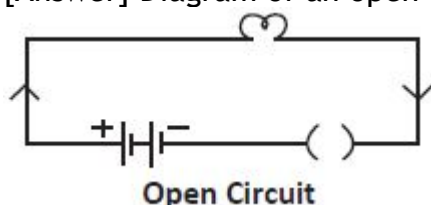
6. What should you do if you want to increase the magnetic power of an electromagnet?

[Answer] The magnetic power of an electromagnet can be increased by: (i) Increasing the strength of the current flowing through it. (ii) Increasing the number of turns of the coil of the solenoid.

Long answer question

1. Draw a circuit diagram of an open circuit with the following components. Use proper symbol for the components.
- Battery
 - Switch
 - Connecting wire
 - A bulb

[Answer] Diagram of an open circuit.



2. Write down an experiment that you can perform to show the heating effect of current. Draw a proper circuit diagram for your experiment.

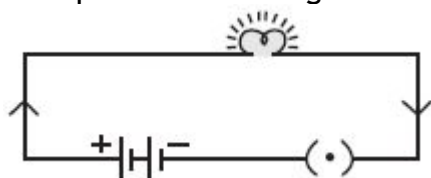
[Answer] **Aim:** To show the heating effect of electric current.

Materials required: wax, an electric circuit with a bulb

Method: (i) Place a small drop of wax on the surface of an electric bulb and allow it to solidify. (ii) Connect the bulb in a simple circuit to make it glow. (iii) Close the circuit by putting the switch 'on'. (iv) Observe the wax after a few minutes.

Observation: It is observed that the wax starts melting after few minutes.

Conclusion: This experiment proves that electric current flowing through the bulb produces heating effect.



3. Describe Oersted's experiment in detail along with a circuit diagram.

[Answer] **Aim:** To demonstrate the magnetic effect of electric current (Oersted's experiment)

Materials required: cell, Petri dish, copper wires, switch, compass

Method: (i) Place a magnetic compass in a Petri dish. (ii) Fix an insulated copper wire across the rim of the Petri dish such that the wire is aligned in

the same direction as the compass needle. (iii) Connect one free end of the wire to a cell and the other end to a switch to form a circuit. (iv) Turn on the switch and observe the compass needle.

Observation: It is observed that when the switch is turned on, the magnetic needle starts deflecting. When the switch is turned off, the magnetic needle comes back to its original position. When the direction of the current is reversed, the magnetic needle deflects in the opposite direction.

Conclusion: This experiment demonstrates that the electric current flowing through the wire produces a magnetic effect. (Diagram: Refer to the textbook.)

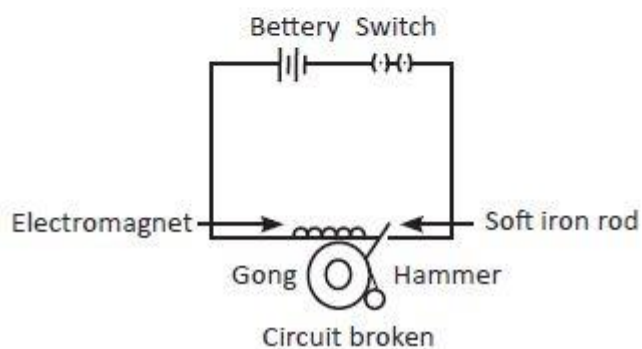
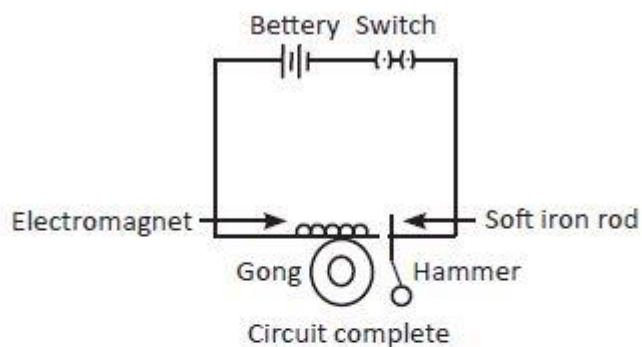
4. How does an electric doorbell work? Explain with proper diagrams.

[Answer] An electric bell works on the principle of the magnetic effect of electric current.

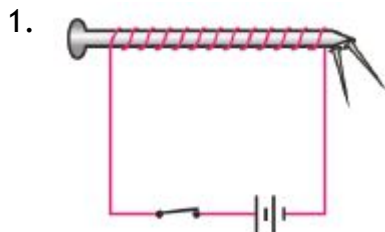
The electric bell has a soft iron rod that is attached to a hammer at one end. When this hammer hits a metal gong, it makes sound. The circuit has a switch, which controls the flow of electricity.

When the switch is turned on, current flows through the electromagnet. The electromagnet attracts the soft iron rod towards itself. This causes the hammer to hit the gong and produce a ringing sound. The movement of the iron rod towards the electromagnet breaks the circuit. The electromagnet loses its magnetic nature and it can thus no longer attract the iron rod. The iron rod moves back to its original position and the circuit is completed once more. The electromagnet attracts the hammer and it hits the gong again. This process of completing and breaking the circuit goes on and the bell rings as long as the switch is on. (Diagrams: Refer to the textbook)

Electric bell



B. Picture-based question.



Caption the given image. What will happen if:

- a. the circuit broken?
- b. the number of loops around the nail is increased?
- c. the battery is removed?
- d. one more cell is added to the battery?

[Answer] Caption: An electromagnet.

- a. The current will stop flowing and the nail will lose its magnetic property.
- b. The magnetic strength of the electromagnet will increase.
- c. The current will stop flowing and the electromagnet will stop working.
- d. The magnetic strength of the electromagnet will increase.

1.Assertion (A): Fuse is a safety device which prevents damages to electrical circuits and possible fires.

Reason (R): The fuse wire blows off and breaks the circuit and prevents fire and damage.

Ans : Option A

2.Assertion (A): Bulb filament is made of tungsten.

Reason (R): The filament should have low melting point.

Ans : Option C