

NOTES

CLASS 7

SCIENCE

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ELECTRIC CURRENT AND ITS EFFECTS

- The flow of electrons across a conductor is known as electric current.
- The use of symbols to represent electric components is convenient. A circuit diagram can be used to represent an electric circuit using these.
- When an electric current is passed via a wire, it heats up. It's the current's heating impact. This effect can be used in a variety of ways.
- When enormous electric currents are pushed through wires constructed of specific materials, they melt quickly and shatter. Electric fuses, which prevent fires and damage to electrical appliances, are made from these materials.



- One cell's positive terminal is connected to the following cell's negative terminal. A battery is a collection of two or more cells in this configuration.
- A wire acts like a magnet when an electric current travels through it.
- A full path for the flow of electric current is referred to as an electric circuit.
- Components of an Electric Circuit: The following are components of an electric circuit:
 - I. Cell: A cell is a device that provides energy to allow current to flow.
 - II. Bulb: When an electric current passes through it, it illuminates.
 - III. Switch: Turns on or off the circuit.
 - IV. **Connecting Wires:** These wires assist in the conduct of electric current and the completion of the circuit.

Electric Current's Effects:

- I. **Heating Effect:** When an electric current runs through a wire, it heats up. This is the electric current's heating impact. When current travels through an electric heater, a coil of wire called the element gets red hot. The quantity of heat generated by a wire is determined by the material, length, and thickness of the wire.
- II. **Fuse:** A fuse is a safety device that protects an electric circuit from harm. A small wire is inserted into porcelain or insulating material to create it.
- III. **MCB:** The abbreviation MCB stands for Miniature Circuit Breakers. When the current in a circuit reaches the safe limit, these switches automatically turn off.
 - Magnetic effect occurs when an electric current travels across a wire. This is the electric current's magnetic effect. Hans Christian Oersted was the first to notice this.
 - An electromagnet is a current-carrying coil of insulated wire wound around a piece of iron. It is a wire coil wound on a soft iron core that is used to separate magnetic material from garbage. Small electromagnets are used by doctors to remove small bits of magnetic material that have accidentally fallen into the eye. Electromagnets are also found in many toys.



SOME IMPORTANT QUESTIONS

1. What is a circuit diagram?

Answer: It is a symbolic representation of an electric circuit.

2. Which property of a conducting wire is utilised in making electric fuse?

Answer: Low melting point of the wire.

3. What is electric current?

Answer: Electric current is flow of electrons.

4. Why does light bulb get hot?

Answer: Light bulb gets hot due to heating effect of the electric current.

5. Who discovered magnetic effect of current?

Answer: Hans Christian Oersted discovered magnetic effect of current.

6. How does a bulb glow?

Answer: In the bulb there is a thin wire, called the filament, which glows and gives off light when an electric current passes through it.

7. Write some uses of battery.

Answer: Many devices such as torches, transistors, toys, TV remote controls, use batteries.

8. Which wire used in electric heater and why?

Answer: Nichrome wire is used in electric heater because it has a high melting temperature.

9. What is filament?

Answer: In the bulb there is a thin wire, called the filament, which glows when an electric current passes through it.

10. Is it possible for a wire to melt and break? Why?

Answer: Yes, if a large current passes through a wire, the wire may become so hot that it may even melt and break.

SOME EXTRA QUESTIONS

1. What is the heating effect of the electric current?

Answer: The wire gets hot when an electric current passes through it. This is the heating effect of the electric current.

2. Who invented electric bulb?

Answer: The credit for the invention of the electric bulb is usually given to Thomas Alva Edison, though others before him had worked on it.

3. What are the uses of heating effect of electric current?

Answer: Electrical appliances, such as immersion heaters, hotplates, irons, geysers, electric kettles, hair dryers uses of heating effect of electric current.

4. Explain the symbol of electric cell.

Answer: In the symbol of the electric cell, the longer line represents the positive terminal and the thicker, shorter line represents the negative terminal.

5. Name any two effects of electric current.

Answer: The two effects of electric current are:

- Heating effect of electric current
- Magnetic effect of the electric current

6. Why are fuse wires not used in circuit containing electric cell?

Answer: Fuse wires are not used in circuit containing electric cell because the amount of current follow is low and if the circuit breaks there is no risk of fire.

7. What is an electric circuit?

Answer: The electric circuit provides a closed path for electricity to pass between the two terminals of the electric cell. The bulb glows only when current flows through the circuit.

8. We could not see element in electrical appliances. Give reason.



Answer: We could not see element in electrical appliances because electrical appliances, such as immersion heaters, hotplates, irons, geysers, electric kettles, hair dryers, have elements inside them.

9. Why a fused bulb does not glow?

Answer: A break in the filament of an electric bulb means a break in the path of the current between the terminals of the electric cell. Therefore, a fused bulb will not glow as current does not pass through its filament.

10. Sometimes the cells are placed side by side. Then how are the terminals of the cells connected?

Answer: There is usually a thick wire or a metal strip connecting the positive terminal of one cell to the negative terminal of the next cell.

11. Why should we look for ISI mark on electrical appliances?

Answer: Before buying any electrical appliance we should look for ISI mark because this mark ensures that the appliance is safe and wastage of energy is the minimum.

12. On what factors does the heat produced in a wire depend?

Answer: The amount of heat produced in a wire depends on its material, length and thickness. Thus, for different requirements, the wires of different materials and different lengths and thicknesses are used.

13. What is battery? How can it be made using cells?

Answer: A combination of two or more cells is called a battery. Battery can be made by connecting two or more cells together. The positive terminal of one cell is connected to the negative terminal of the next cell.

14. Do you think an electromagnet can be used for separating plastic bags from a garbage heap? Explain.

Answer: No, an electromagnet cannot be used for separating plastic bags from a garbage heap because plastic bag is a non-magnetic material and will not be attracted by an electromagnet.



LONG QUESTIONS

1. What are electromagnets?

Answer: A core of magnetic material (such as iron) surrounded by a coil of wire behaves like a magnet when electric current flows through it. When the electric current is switched off, the coil generally loses its magnetism. Such coils are called electromagnets.

2. How does a heating element work in an electric heater?

Answer: An electric room heater or an electric heater used for cooking. All these contain a coil of wire. This coil of wire is called an element. When these appliances are switched on after connecting to the electric supply, their elements become red hot and give out heat.

3. What is MCB and what is it used for?

Answer: These days Miniature circuit breakers (MCBs) are increasingly being used in place of fuses. These are switches which automatically turn off when current in a circuit exceeds the safe limit. We can turn them on and the circuit is once again complete.

4. An electrician is carrying out some repairs in your house. He wants to replace a fuse by a piece of wire. Would you agree? Give reasons for your response.

Answer: No, electrician should not replace a fuse by a piece of wire because for fuse, wires made from some special materials are used so that it melt quickly and break when large electric currents passes through them.

5. What are the reasons for excessive currents in the electrical circuits?

Answer: One reason for excessive currents in electrical circuits is the direct touching of wires. This may happen if the insulation on the wires has come off due to wear and tear. This may cause a short circuit. Another reason for excessive current can be the connection of many devices to a single socket. This may cause overload in the circuit.

6. An electric bulb results in wastage of electricity. Comment

Answer: An electric bulb is used for light but it also gives heat. This is not desirable. This results in the wastage of electricity. This wastage can be reduced by using fluorescent tube lights in place of the bulbs. **Compact fluorescent lamps (CFLs)/ Light Emitting Diode (LED)** also reduce wastage and can be fixed in the ordinary bulb holders.

7. What is the use of electrical fuse?

Answer: In all buildings fuses are inserted in all electrical circuits. There is a maximum limit on the current which can safely flow through a circuit. If by accident the current exceeds this safe limit, the wires may become overheated and may cause fire. If a proper fuse is there in the circuit, it will blow off and break the circuit. A fuse is thus a safety device which prevents damages to electrical circuits and possible fires.



CHAPTER-11

LIGHT

- Light is a naturally occurring substance that enhances vision and makes objects visible. Light follows a straight path.
- A mirror can be made out of any polished or gleaming surface.
- A true image is one that can be obtained on a computer screen. It's made up of light rays that pass through the screen.
- A virtual image is an image that cannot be obtained on a screen. It's made up of light rays that appear to travel right through the screen.
- A planar mirror produces an erect picture. It's a virtual object that's the same size as the real thing. The picture behind the mirror is the same size as the object in front of it.

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