

CHAPTER 14: Electric Current and its Effects

- Electric current is the flow of charged particles through a conductor.
- An electric cell is denoted by a longer line and a shorter, thicker parallel line.
- The two terminals in a cell are positive terminal and a negative terminal.
- The longer line indicates positive terminal and the thicker, shorter line indicates a negative terminal.
- Black and red lines represent the wires used to connect the various components in a circuit.
- Usually, the positive terminal is connected to negative terminal of the next cell.
- If two or more cells, are connected in parallel or series in combination is called a battery.
- Instruments like torches, transistors, toys, TV remote controls operates on batteries.
- The battery section of any device is usually made up of a thick wire or metal strip connecting the positive terminal of one cell to the negative terminal of the next cell.
- The '+' and '-' symbols are usually printed to indicate positive and negative terminals of the cell.
- Cell holders are commercially available.
- To construct the battery, in the cell holder properly place the cells in such a way that the positive terminal of one cell is connected to the negative terminal of the next cell.
- In the 'ON' state the circuit from the positive terminal of the battery to the negative terminal is complete and current flows through the battery.
- In the 'OFF' state the circuit is incomplete and is said to be open. Current does not flow in this state.
- A bulb is made of thin filament that glows when an electric current passes through it.
- When there is overflow of current, the bulb gets fused and its filament is broken.
- Electric current has a heating effect.
- No experimentation should be carried out with electric supply from the mains or a generator or an inverter.
- An electric room heater or an electric heater used for cooking is an example of heating effect of electric current.
- A coil of wire in electric heater is called an element, whenever these appliances are switched on after connecting to the electric supply, their elements become red hot and give out heat.
- The heat produced is affected by the material, length and thickness of conducting material.
- The wires used for making electric circuits do not normally become hot whereas the elements of some electric appliances become hot and start glowing.
- If overflow of current occurs it may melt the wire and break it.
- Example: Incandescent electric bulbs
 - 1.) It gives light and heat.
 - 2.) The fluorescent tube-lights and compact fluorescent lamps (CFLs) are better electricity efficient lighting sources.
 - 3.) light emitting diode (LED) bulbs are used this day for producing a given intensity of light, LED bulbs consume less electricity.
 - 4.) The Bureau of Indian Standards, New Delhi gives a Standard Mark on products, called ISI mark.
- Wires made from materials which melt and break when current overflows from it.

- These wires can be used for making electric fuses.
- In all buildings fuses are inserted in allelectrical circuits.
- A safety device is also added to the fuse setup which prevents damages to electrical circuits and fires.
- The heating effect of electric current can be used for our advantage.
- Excessive current in wire can cause short circuit.
- Excessive current can lead to short circuit if many devices to a singlesocket.
- Miniature circuit breakers (MCBs) are installed in electrical appliances like immersion heaters, hotplates, irons, geysers, electric kettles, hair dryers in place of fuse.
- MCBs automatically turn off the appliance when current in a circuit exceeds the safe limit.

➤ **MAGNETIC EFFECT OFELECTRIC CURRENT:**

- 1.) The needle of a compass is a magnet pointing in the north- south direction.
- 2.) This needle shows deflection when it comes in contact with another magnet or wires through which current is flowing.
- 3.) As electric current passes through a wire, it functions like a magnet and is popularly known as magnetic effect of the electric current.

- **ELECTROMAGNETS:**

- 1.) When wire conducting electric current is wound around magnet electromagnets are generated.
- 2.) On switching of the current these electromagnets loss their magnetic properties.
- 3.) Strong electromagnets can be used to lift heavy load.
- 4.) They are also used to separate iron fillings and other magnetic material from waste.
- 5.) Many toys have electromagnetic components in them.

- **ELECTRIC BELL**

- 1.) electric bell has a small electromagnet inside it.
- 2.) It has a coil of wire wrapped around a iron piece serving as a electromagnet when the circuit is completed.
- 3.) Another small iron strip is placed near the electromagnet which connected by a screw.
- 4.) If the circuit is complete the iron strip contacts the screw, current flows through the coil which becomes an electromagnetic.
- 5.) It then, pulls the iron strip and hammer at the end of the strip to strikethe gong of the bell to produce a sound.
- 6.) When the circuit breaks the electromagnetism is lost and does not attracts the iron strip anymore
- 7.) Original position of the iron strip and screw are regained.