

UNIT 3

Electromagnetic Induction

12/11/2020 – Class 29

Activity 1

Discussion

- What is the main advantage of electrical energy over other forms of energy? **Electrical energy can easily be converted into many other forms.**
- Different safety measures are inbuilt in household circuit. Why? **Electricity is a form of energy that is extremely dangerous.**
- In the first unit, we studied about a safety device used in the household electric circuit. What is that? **Safety fuse.**
- In which line is the safety fuse connected? **Phase line.**
- Name the devices in the household electrical circuit in the sequence order? **Watt hour meter, Main fuse, Main switch, ELCB, MCB, Switch board.**
- What is the use of fuse in the household circuit? **To protect the circuit against excess flow of current due to overloading and short circuit.**
- When excess current flows in a circuit, what may happens? **Circuit may burnt, the devices connecting may get damaged, and the persons working in contact with the devices may get electric shock.**
- When the current in the circuit exceeds the permissible limit, what happens to the heat energy generated in the phase line? **Heat becomes excessive.**
- Then, what happens to the fuse wire in the circuit? **It melts, and break the circuit.**
- After rectifying the defects in the circuit, how can we restore the circuit? **By using a fuse wire of suitable amperage.**

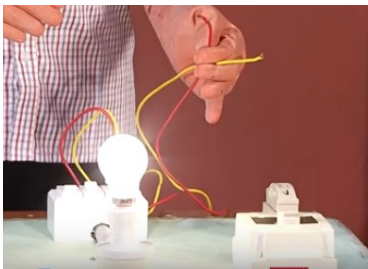
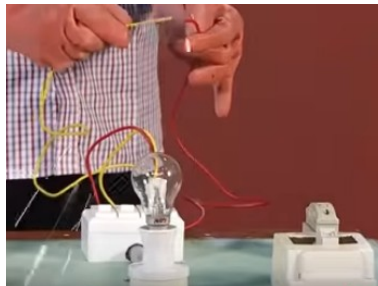
Safety fuse

- Safety fuse is a device which protects us and the appliances from danger when an excess current flows through the circuit.
- When the current that flows into the circuit exceeds the permissible limit, the heat generated becomes excessive. Because of it's low melting point the fuse wire melts and break the circuit.
- A circuit can be brought back to its original state by using a fuse wire of suitable amperage after rectifying the issue of excess current in it.



Activity 2

- Which device is used in the branch circuit, instead of fuse wire? **MCB (miniature circuit breaker)**

Activity	Observation
<p>A bulb and MCB is connected in a circuit. Connect the phase line to the neutral line directly.</p> 	<p>Short circuit happens and MCB is tripped off.</p> 

Discussion

- When short circuit happens, how is the circuit broke? **MCB is tripped off.**
- Which effects of electric current is used here? **Magnetic effect.**
- MCB is tripped off with the help of which effects of electric current during overloading? **Heating effect.**
- How can we reinstate the circuit? **After rectifying the defects in the circuit switch on the MCB.**

MCB (Miniature circuit breaker)

MCB is a device that is used in the place of a fuse wire branch circuits. MCB automatically breaks the circuit whenever there is an excess flow of current due to short circuit or overloading. After rectifying the circuit we can switch on the MCB and make the circuit as it was. MCB works making use of heating and magnetic effects of electricity.



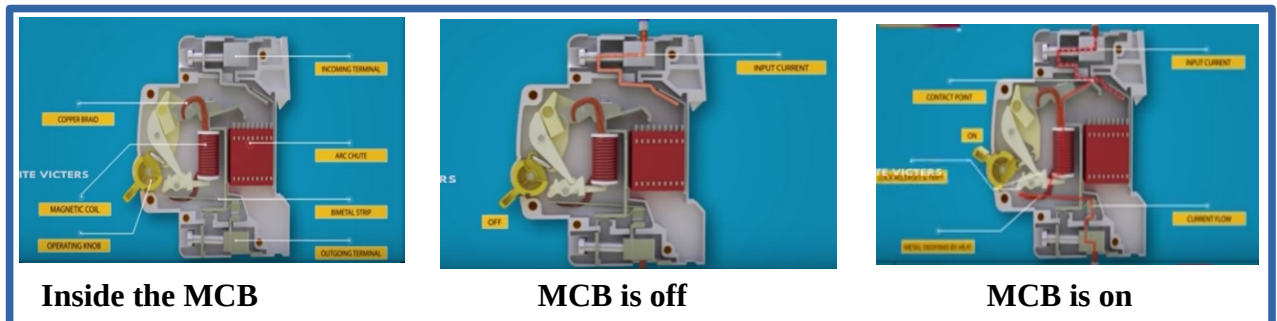
Difference between Fuse and MCB

Safety Fuse	MCB
Works on the basis of heating effect of electric current.	Works on the basis of heating effect and magnetic effect of electric current.

- What is the advantage of MCB over fuse? **MCB is an automatic device. So it is safer than fuse.**

Activity 3

Watch the animation showing the working of MCB.



Activity 4

- What are the other devices used in the household circuit for safety? **ELCB or RCCB.**
- What is the use of this devices? **It helps to break the circuit automatically whenever there is a current leak due to insulation failure or any other reason.**

ELCB (Earth Leakage Circuit Breaker)

- ELCB helps to break the circuit automatically whenever there is a current leak due to insulation failure or any other reason. Hence a person touching the electric circuit or a device does not get an electric shock.
- Nowadays **RCCB(Residual current circuit breaker)**, which ensures more safety than ELCB is made use of.



ELCB

Assignment

What are the other safety measures used in the household electrical circuit?