Chapter – 12

SOME NATURAL PHENOMENA

Electric Charge

Electric charge is the property of matter which is responsible for electrical phenomena. Electric charge exists in two forms: positive electric charge and negative electric charge.

Types of Electric Charges and Their Interactions

There are two types of electric charges: positive charges and negative charges. A positive charge repels another positive charge, but a positive charge attracts a negative charge. Similarly, a negative charge repels another negative charge, but a negative charge attracts a positive charge.

Uncharged and Charged Objects

An object having no electric charge on it is called an uncharged object. An uncharged object does not have any effect on other objects. An object having electric charge on it is called a charged object. A charged object attracts other uncharged objects. The process of giving electric charge to an object is called charging the object.

Transfer of Charge

A device can be used to test whether an object is carrying charge or not. This device is known as electroscope.

Electrical charge can be transferred from a charged object to another through a metal conductor. The process of transferring of charge from a charged object to the earth is called earthing.
Earthing is provided in buildings to protect us from electrical shocks due to any leakage of electrical current.

Charging an Object by Rubbing (or Friction)

The simplest method of charging an object is to rub it with another suitable object (such as silk cloth, woollen cloth, hair, paper or polythene, etc.).

Charging by Conduction

The process by which electric charge is produced in a conductor by bringing a charged object in contact with it is called charging by conduction.

Charging by Induction

The process of charging an object by bringing it closer but without actual contact with charged objects is called charging by induction.

ELECTROSCOPE

The electroscope is a device for detecting electric charge on an object. By using an electroscope, we can tell whether an object is electrically charged or not.

Electric Discharge

The process of flow of electric charge from one body to another body is known as electric discharge. The process of electric discharge can occur between two or more clouds, or between clouds and the earth.

SOME NATURAL PHENOMENA

Lightning

During a thunderstorm, the air currents move upward while the water droplets move downward. These vigorous movements cause separation of charges. The positive charges collect near the upper edges of the clouds and the negative charges accumulate near the lower edges. There is accumulation of positive charges near the ground also.
When the magnitude of the accumulated charges becomes very large, the air which is normally a poor conductor of electricity, is no longer able to resist their flow. Negative and positive charges meet, producing streaks of bright light and sound. We call it as lightning.

Lightning Safety

During lightning and thunderstorm no open place is safe.

1. Hearing thunder is an alert to rush to a safer place.

2. After hearing the last thunder, wait for some time before coming out of the safe place.

Lightning Conductors

Lightning Conductor is a device used to protect buildings from the effect of lightning. A metallic rod, taller than the building, is installed in the walls of the building during its construction. One end of the rod is kept out in the air and the other is buried deep in the ground. The rod provides easy route for the transfer of electric charge to the ground.

The metal columns used during construction, electrical wires and water pipes in the buildings also protect us to an extent. But do not touch them during a thunderstorm.

Earthquakes

An earthquake is a sudden shaking or trembling of the earth which lasts for a very short time. It is caused by a disturbance deep inside the earth's crust. There can be a great loss to life and property. Earthquakes can cause floods, landslides and tsunamis.

What Causes an Earthquake?

The uppermost layer of the earth called the crust. The outermost layer of the earth is not in one piece. It is fragmented. Each fragment is called a plate. These plates are in continual motion.
When the plate goes under another due to collision, they cause disturbance in the earth's crust. It is this disturbance that shows up as an earthquake on the surface of the earth.

Protection against Earthquakes

First of all, the buildings in these zones should be so designed that they can withstand major tremors. Modern building technology can make it possible. It is advisable to make the structure simple so that it is 'Quake Safe'.