Science Chapter 10

Short Answer Type Questions

1. Why does a plastic comb rubbed with dry hair attract tiny pieces of paper?
   Ans. When we rub the plastic comb with our dry hair, the plastic comb gets electric charge due to friction. The electrically charged comb then exerts an electric force on the tiny pieces and attracts them.

2. How will you charge a glass rod by the method of friction?
   Ans. Rub the glass rod with a silk cloth to charge it by the method of friction.

3. What will you observe when the metal top of an electroscope is touched with a plastic comb rubbed in dry hair? Give reason for your answer.
   Ans. When the top end of metal top of the electroscope is touched with a plastic comb rubbed in dry hair, then the aluminium leaves of the electroscope diverge. This is because the two aluminium leaves get the same charge and hence repel each other.

4. What happens when we touch the metal top of a charged electroscope with our finger? What is this process known as?
   Ans. If we touch the metal top of a charged electroscope with our finger, it gets discharged and its aluminium leaves collapse.
   The process in which the metal top of charged electroscope is touched with finger and its charge flows down into the Earth through our hand and body, is called earthing.

5. How will you find out whether an object is charged or not?
   Ans. By using an electroscope, we can tell whether an object is electrically charged or not.

6. What happens when the two plates of earth's crust moving in opposite directions slide past one another?
   This disturbance in the earth's crust shows up as an earthquake on the surface of the earth.

7. Explain why, it might be dangerous to raise an umbrella over our head in a thunderstorm.
   Umbrellas are made up of metals. The electric discharge from clouds can travel through the metal rod of umbrellas and may get shocked.

8. A person is in open space during a thunderstorm with no shelter (not even a tree) available nearby. Describe the safe position which he should take to protect himself from lightning. Why is this position considered safe?
   We must not lie on the ground but we should squat low on the ground. Hands must be placed on the knees and the head should be between the hands. This position will make us the smallest target to be struck.

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9. Explain why, sometimes when we take off the woollen sweater or a polyester shirt in a dark room, we can see tiny sparks of light and hear a crackling sound.
   Ans. The sweater or a polyester shirt gets charged due to friction between the sweater and the body. It sometimes produces a large amount of electric charges and the air between them conducts electricity in the form of spark. That is why we can see tiny sparks of light and hear a crackling sound when we take off a woollen sweater or polyester cloth.

10. (a) Name the material of which a lightning conductor is made.
    The lightning conductor is made up of metal which is a good conductor of electricity and used to protect building which is tall from lightning.

    (b) What is the shape of the top end of a lightning conductor?
    The lightning conductor is made of a metal rod with a sharp-pointed edge on the top.

    (c) Where is the upper end of the lightning conductor fixed in a building?
    One end of the rod is kept out in the air and the other end is buried deep in the ground.

    (d) Where is the lower end of the lightning conductor fixed and how?
    The lower end of the rod is buried deep in the ground and the upper end is kept out in the air. The metallic rod transfers the electric charge to the ground.

11. What precautions would you take to protect yourself during an earthquake if you are inside the house?
    - We must take shelter under the table and should stay until the shaking stops.
    - We must stay away from the heavy objects to avoid them to fall on us.
    - If we are in bed, we must stay in it and should protect our head with a pillow.

12. State any two precautions which should be observed by people living in seismic zones for protection against earthquakes.
    - The buildings in these zones should be designed so that they can withstand tremors. Modern building technology can make it possible.
    - Mud and timber should be used as a construction material instead of heavy construction material. The roofs should be kept as light as possible.

See below for Long Answer Type Questions

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*Long Answer Type Questions —

1. What is an electroscope? Draw a labelled diagram of an electroscope and explain its working.

The electroscope is a device for detecting electric charge on an object.

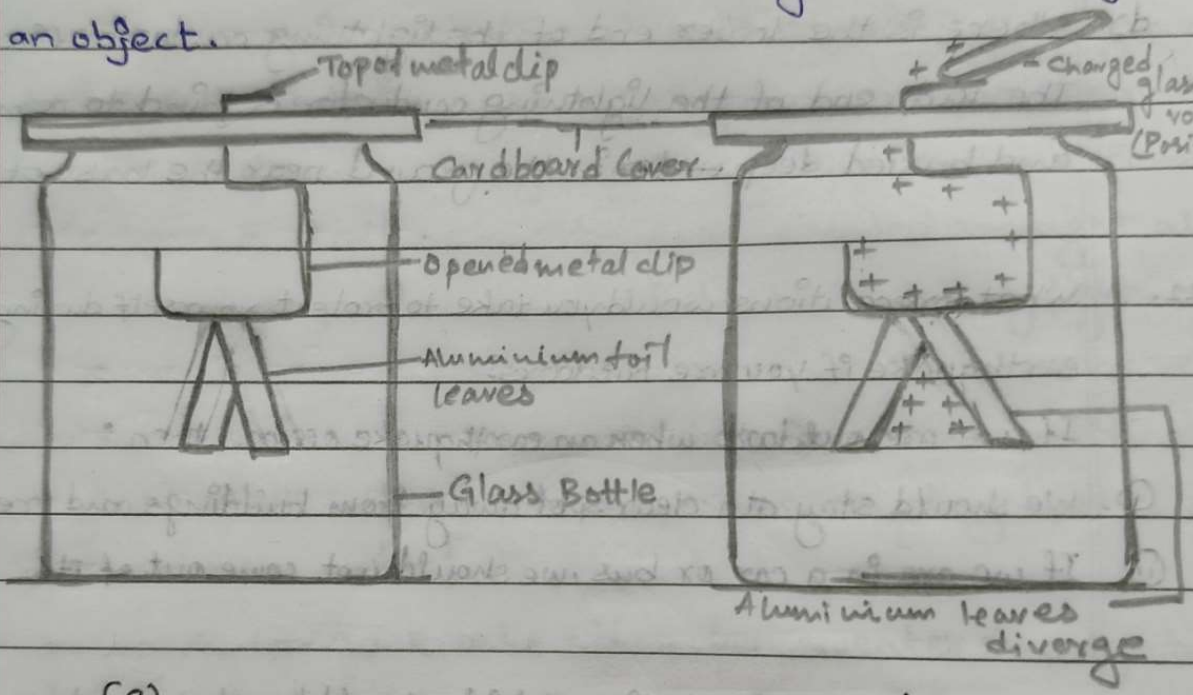

Fig 1. Electroscope

When a charged glass rod is touched to the top end of metal clip, the ~~the~~ charge (whether positive or negative) flows down the clip to the aluminium leaves. The electrically charged leaves having the same charge repel each other and the aluminium leaves diverges and we are able to tell if it is charged ~~or~~ or not.

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02.a) What is lightning? How is lightning produced between clouds in the sky?

The bright flash of light which we see in the clouds is called lightning. When a storm cloud develops in the sky, the top of the cloud becomes positively charged whereas the bottom becomes negatively charged. When the positive and negative charges of a cloud meet, they produce an intense spark of electricity between the cloud in the sky.

b) Why does lightning usually strike tall buildings?

Lightning usually strikes tall buildings because all these buildings are closer to the charged clouds than the ground.

c) What damage can be done when lightning strikes on the Earth?

When lightning strikes the earth, it can cause a lot of destruction by damaging property, trees and killing people.

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03.a) How does a lightning conductor protect a tall building? Name the scientist who invented the lightning conductor.

If lightning strikes on a tall building, it will hit the top of the lightning conductor rather than the roof of the building. A lightning conductor protects a tall building against lightning by providing its electric energy an easy path to go to the ground.

The scientist who invented the lightning conductor was Benjamin Franklin.

b) Why are lightning strikes more frequent in hilly areas?

Lightning strikes are more frequent in hilly areas because in such areas clouds are comparatively closer to the ground than in the plains.

04.a) What is an earthquake? what are the two main situations in which earthquakes occur?

An earthquake is a sudden shaking of the earth which lasts for a very short time.

The earthquakes occur when the moving plates of the earth's crust:

(i) slide past one another.

(ii) collide with one another.

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b) Define (i) Focus, and (ii) Epicentre, of an earthquake.

(i) Focus — The place inside the earth's crust where the earthquake is generated, is called 'focus' of the earthquake.

(ii) Epicentre — The point on earth's surface directly above the focus is called epicentre.

c) What are the various effects of ~~the~~ an earthquake?

Earthquakes can cause immense damage to houses, other buildings bridges, dams and people, etc. A lot of people get killed when they get buried under the debris of collapsed houses and other buildings during an earthquake. Earthquakes can also cause floods, landslides, and tsunamis.

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05.a) Name the three layers of earth. Draw a labelled diagram to show the structure of earth.

The inside of earth is made up of three main layers: Core, Mantle and Crust.

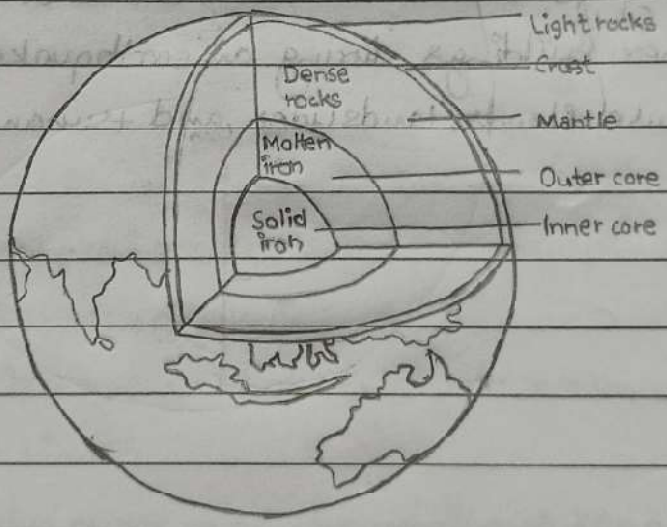

Fig: The Structure of Earth

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b) What is a seismograph? Draw a labelled diagram of a seismograph.

Seismograph is an instrument which measures and records the magnitude of an earthquake in terms of the shock waves it produces.

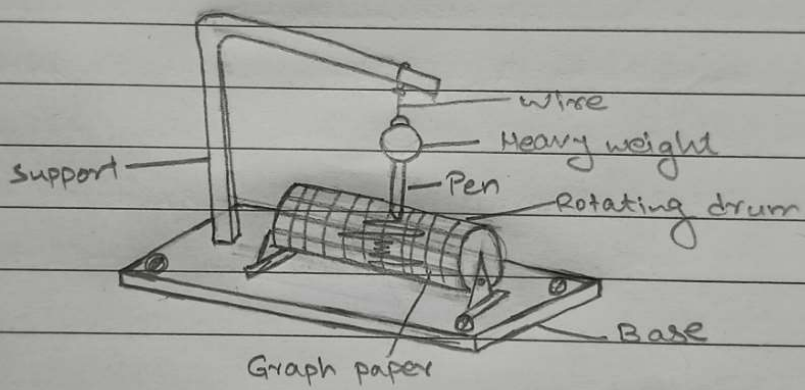

Fig: A seismograph.

"—— The End ——"