CHAPTER-15
SOME NATURAL PHENOMENA

SOLUTIONS:

EXERCISES

Select the correct option in Question 1 and 2.

1. Which of the following cannot be charged easily by friction?
   a. A plastic scale
   b. A copper rod
   c. An inflated balloon
   d. A woollen cloth.
   Ans: (b) A copper rod.

2. When a glass rod is rubbed with a piece of silk cloth the rod
   a. and the cloth both acquire positive charge.
   b. becomes positively charged while the cloth has a negative charge.
   c. and the cloth both acquire negative charge.
   d. becomes negatively charged while the cloth has a positive charge.
   Ans: (b) becomes positively charged while the cloth has a negative charge.

3. Write T against true and F against false in the following statements.
   a. Like charges attract each other. (T/F)
   b. A charged glass rod attracts a charged plastic straw. (T/F)
   c. Lightening conductor cannot protect a building from lighting. (T/F)
   d. Earthquakes can be predicted in advance.(T/F)
   Ans: (a) F

   (b) T

   (c) F

   (d) F

4. Sometimes, a crackling sound is heard while taking off a sweater during winters. Explain.

Ans: While taking off a sweater, the sweater gets charged due to friction between the sweater and the body. Hence, electric discharge takes place between the sweater and the body producing sparks and sound.

5. Explain why a charged body loses its charge if we touch it with our hand.

Ans: When a charged body is touched with our hand, electric discharge takes place due to lost of its charge to the earth through our body. Therefore, the body loses its charge.

6. Name the scale on which the destructive energy of an earthquake is measured. An earthquake measures 3 on this scale. Would it be recorded by seismograph? Is it likely to cause much damage?

Ans: The scale on which the destructive energy of an earthquake is measured is Richter scale.

Yes, it would be recorded by seismograph.

It is not likely to cause much damage as really destructive earthquakes have magnitude higher than 7 on the Richter scale.

7. Suggest three measures to protect ourselves from lightning.

Ans: Three measures to protect ourselves from lightening are:-

i. Rushing to a safer place like inside a house or a building.
ii. Staying safe inside the car or bus with windows and door shut if travelling.
iii. Staying away from tall trees, poles and other metallic objects.

8. Explain why a charged balloon is repelled by another charged balloon whereas an uncharged balloon is attracted by another charged balloon.

Ans: Two charged balloons have the same kind of charges. So, they repel to one another when brought together as like charges repel each other. However, unlike charges attract each other. Therefore, when an uncharged balloon is brought near a charged balloon, they get attracted.

9. Describe with the help of a diagram an instrument which can be used to detect a charged body.

   Ans: An instrument used to detect a charged body is called an electroscope.

Fig. A simple electroscope.

A simple electroscope consists of a metal rod on which two strips of aluminum foil are hanged at one end of it. The foils are kept inside a glass jar and covered with a cardboard with a hole in the centre in such a way that the other end of the rod pass through the hole and remain above the cardboard.

When a charged body is touched at one end of the rod, the two aluminum foils receive the same charge through the rod. The strips carrying the same charges repel each other and they become wide open. When the body is not charged, the foils do not repel each other.

10. List three states in India where earthquakes are more likely to strike.

    Ans: The three states are Rajasthan, Assam and Manipur.

11. Suppose you are outside your home and an earthquake strikes. What precaution would you take to protect yourself?

    Ans: Precautions to be taken when we are outside our home and an earthquake strikes are:-

    i. We should find a clear spot, away from buildings, trees and overhead power lines. We should drop to the ground.

    ii. If we are in the car or bus, we should not come out. We should ask the driver to drive slowly to a clear spot. We should not go out till the tremors stop.

12. The weather department has predicted that a thunderstorm is likely to occur on a certain day. Suppose you have to go out on that day. Would you carry an umbrella? Explain.

    Ans: No, it is not a good idea to carry umbrella during thunderstorm. Lightening is an electrical discharge. And umbrellas have metal rods which are good conductor of electricity. So, when a thunderstorm strikes, the electric discharge can pass through the metallic rod and harm the person holding it.

EXTRA QUESTIONS AND ANSWERS

Q1.What causes lightning?

Ans. Lightning is caused by the accumulation of charges in the clouds.

Q2. What is static electricity?

Ans.The electrical charges generated by rubbing two objects are called static electricity.

Q3.What is earthing?

Ans. The process of transferring of charge from a charged object to the earth is called earthing.

Q4.What happen when a plastic comb is rub with dry hair?

Ans. When a plastic comb is rubbed with dry hair, it acquires static charge on rubbing.

Q5. What do you mean by electric discharge?

AnsWhen negative and positive charges meet, producing streaks of bright light and sound. This process is called electric discharge.

Q6.What is an electroscope?

Ans. Electroscope is a device that can be used to test whether an object is carrying charge or not.

Q7.How does electric discharge occurs?

Ans.When the magnitude of the accumulated charges between lower part of clouds and earth becomes very large, air (normally a poor conductor) start conducting and allows the flow of electricity. As a result negative and positive charges meet and produce electric discharge.

Q8.What is a lightning conductor? How does it protect the building from lightning?

Ans. Lightning conductor is a device that is used to protect buildings from the effect of lightning. Lightning conductor consist of 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 air at the top of the building and other end is connected to a copper plate buried deep into the soil. When the lightning occurs, the rod at the top of the building provides easy route for the transfer of electric charge to the ground without harming the building.

Q9. What is an earthquake?

Ans. An earthquake is a sudden shaking or trembling of the earth which last for a very short time.

Q10.What causes an earthquake?

Ans. The outermost layer of the earth is fragmented into many pieces and each fragment is called a plate. These plates are in continual motion. When they brush past one another or a plate goes under another due to collision, they cause disturbance in earth's crust and this disturbance shows up as earthquake on the surface of the earth. Volcano eruption or hitting of earth by meteor can also cause tremors on the earth's surface.

Q11.Whatare seismic or fault zones?

Ans. Earthquakes are caused by the movement of plates. The boundaries of the plates are the weak zones where earthquake are more likely to occur. The weak zones are also known as seismic or fault zones.

Q12. What is a seismograph?

Ans. Seismograph is an instrument which records the seismic wave produced by the earthquakes on the surface of the earth.