

Ans. (b) A copper rod

Only non-conducting materials can be easily charged by friction. Copper is a highly conducting material. Therefore, a copper rod cannot be charged easily by friction.

2. When a glass rod is rubbed with a piece of silk cloth, the rod

 - (a) And the cloth both acquire a positive charge.
 - (b) Becomes positively charged while the cloth has a negative charge.
 - (c) And the cloth both acquire a negative charge.
 - (d) Becomes negatively charged while the cloth has a positive charge.

Ans. (b) The rod becomes positively charged, while the cloth has a negative charge.

When an object is charged by rubbing it against another object, the two objects get oppositely charged. By convention, it is considered that the charge acquired by the glass rod is positive, and the charge acquired by the cloth is negative. Therefore, the rod becomes positively charged, and the cloth becomes negatively charged.

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) Lightning conductor cannot protect a building from lightning. (T/F)
 - (d) Earthquakes can be predicted in advance. (T / F)

Ans. (a) False

Like charges repel each other. And unlike charges that attract each other.

(b) True

A charged glass rod has positive charges on its surface, while a charged plastic straw has negative charges. Since unlike charges attract each other, a charged glass rod attracts a charged plastic straw.

(c) False

The lightning conductor conducts all the atmospheric charges to the Earth directly during lightning, leaving the building safe. Hence, lightning conductors protect a building from lightning.

(d) False

Although the causes of earthquakes are known, no instrument could be invented to detect them until now. Hence, earthquakes cannot be predicted in advance.

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

Ans. When a sweater is taken off, the woollen sweater gets charged because of the friction between the sweater and the body. Hence, one can hear a crackling sound during the given process.

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

Ans. When we touch a charged object, our body conducts its charges to the Earth. That is why a charged body loses its charge if we touch it with our hand. This phenomenon is known as electric discharge.

6. Name the scale on which the destructive energy of an earthquake is measured. An earthquake measures three on this scale. Would a seismograph record it? Is it likely to cause much damage?

Ans. The Richter scale measures the destructive energy of an earthquake. This scale has readings from 1 to 10.

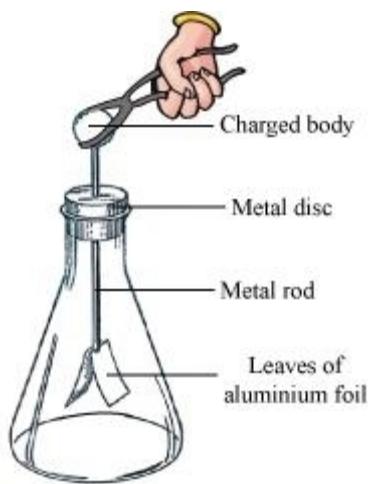
A seismograph would record the reading of magnitude 3 on the Richter scale.

If the Richter scale gives a reading of magnitude 3, then the earthquake is not likely to cause much damage. Generally, an earthquake of magnitudes higher than five is considered destructive.

7. Suggest three measures to protect ourselves from lightning.

Ans. Protective measures against lightning are as follows.

- (i) Stay in a completely closed place. If you are moving in a car, then remain there until the lightning is over. Close the windows of the car immediately.
 - (ii) Do not touch any electrical wires, telephone cables, metal pipes, etc.
 - (iii) Do not bathe in running water. This may cause an electric shock.
- 8.** Explain why another charged balloon repels a charged balloon whereas an uncharged balloon is attracted by another charged balloon?
- Ans.** The nature of charges presented on the surface of charged balloons is similar. Since like charges repel each other, two charged balloons repel each other. When a charged body is brought near an uncharged body, it acquires charges on its surface caused by the induction of charges. The charges are opposite in relation to the charged body. Since unlike charges attract each other, a charged body always attracts an uncharged body. Hence, an uncharged balloon is attracted by another charged balloon.
- 9.** List three states in India where earthquakes are more likely to strike.
- Ans.** The three states in India where earthquakes are more likely to strike are Jammu and Kashmir, Gujrat, and Assam.
- 10.** Suppose you are outside your home and an earthquake strikes. What precaution would you take to protect yourself?
- Ans.** Some of the precautions are as follows.
- (i) Try to find an open field away from tall buildings, installations, tall trees, and electric wires and poles.
 - (ii) If travelling in a bus or a car, do not come out when an earthquake strikes. Ask the driver to drive in an open field.
- 11.** Describe with the help of a diagram an instrument that can be used to detect a charged body.
- Ans.** An electroscope can be used to detect whether a body is charged or not. The following figure shows a simple electroscope.



It consists of a metal rod. Two aluminium foil leaves are fixed at one end of the rod, and at the other end, there is a metal disc. The aluminium foil leaves are placed inside a conical flask, and the flask is corked to isolate the leaves from the air.

When the metal disc is touched with a charged body, the aluminium strips move away from each other. This happens because some of the charges of the body are transferred to the strips through the metal rod. This method of charging a body is called charging by conduction. The nature of charges on both the leaves and the charged body is similar. Hence, both the leaves of the aluminium foil will move away from each other. If the body were not charged, then the leaves of the foil would remain as they were before. They would not repel each other.

- 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. We should not carry an umbrella in a thunderstorm. During thunderstorms, which are accompanied by lightning, electric discharge from the clouds can travel through the metallic rod of the umbrella. This may give an electric shock to the person who is carrying it. Hence, it is not safe to carry an umbrella during lightning.