

Question 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

Answer:

- (b) A copper rod

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

Question 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.

Answer:

- (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 charged acquired by the glass rod is positive and charged acquired by the cloth is negative. Therefore, the rod becomes positively charged and the cloth becomes negatively charged.

Question 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)

Answer:

- (a) False

Like charges repel each other. It is the 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 on its surface. Since unlike charges attract each other, a charged glass rod attracts a charged plastic straw.

(c) False

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

(d) False

Although the causes of earthquakes is known, but no instrument could be invented to detect it till now. Hence, earthquakes cannot be predicted in advance.

Question 4:

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

Answer:

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.

Question 5:

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

Answer:

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.

Question 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 a seismograph? Is it likely to cause much damage?

Answer:

The destructive energy of an earthquake is measured by the Richter scale. This scale has the readings from 1 to 10.

The reading of magnitude 3 on the Richter scale would be recorded by a seismograph.

If the Richter scale gives a reading of magnitude 3, then the earthquake is not likely to cause much damage. Generally, earthquake of magnitudes higher than 5 is considered destructive in nature.

Question 7:

Suggest three measures to protect ourselves from lightning.

Answer:

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 bath in running water. This may cause an electric shock.

Question 8:

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

Answer:

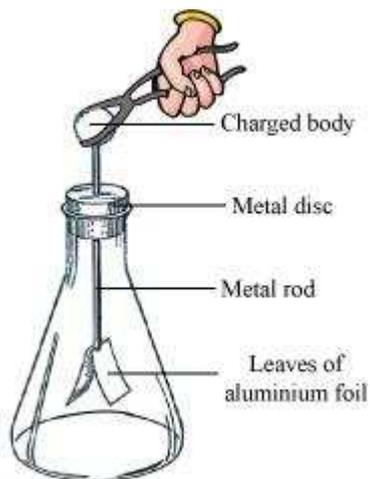
The nature of charges present on the surface of charged balloons are similar. Since like charges repel each other, two charged balloons repel each other. When a charged body is brought near an uncharged body, the uncharged body acquires charges on its surface caused by the induction of charges. The charges are of opposite nature 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.

Question 9:

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

Answer:

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. At one end of the rod, two leaves of aluminium foil are fixed and at the other end, there is a metal disc. The leaves of aluminium foil are placed inside a conical flask and the flask is corked to isolate the leaves from 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 are the similar. Hence, both the leaves of the aluminium foil will move away from each other. If the body was not charged, then the leaves of the foil would remain as they were before. They would not repel each other.

Question 10:

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

Answer:

The three states in India where earthquakes are more likely to strike are Jammu and Kashmir, Gujrat, and Assam.

Question 11:

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

Answer:

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, then do not come out when an earthquake strikes. Ask the driver to drive in an open field.

Question 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.

Answer:

No. We should not carry an umbrella in a thunderstorm. During thunderstorms, which are accompanied with 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.