

Exercise

Select the correct option in Questions 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

Solution:

Option (b) is the correct option because a copper rod is a conducting material while others are not.

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.

Solution:

Option (b) is the correct option because when two objects are rubbed against each other, they acquire opposite charges.

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 attract 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)

Solution:

- (a) Like charges attract each other (F)
- (b) A charged glass rod attract a charged plastic straw (T)
- (c) Lightning conductor cannot protect a building from lightning (F)
- (d) Earthquakes can be predicted in advance (F)

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

Solution:

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Due to friction, electric discharge takes place between the body and the sweater. Some energy is released during the time of electric discharge. In this case energy is released in the form of crackling sound.

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

Solution:

Human body is a good conductor of electricity. When a charged body is touched with hand, the body conducts the charges to the earth. In this way the charged 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 a seismograph? Is it likely to cause much damage?

Solution:

The destructive energy of an earthquake is measured on a scale called the Richter scale.

Yes, an earthquake of measure 3 on Richter scale would be recorded by the seismograph because this scale has the readings from 1 to 10.

No it is not likely to cause much damage because earthquakes of magnitude greater than 5 are considered to be more destructive.

7. Suggest three measures to protect ourselves from lightning.

Solution:

Protective measures against lightning are:

- Stay indoors or under a covered area.
- Do not use any electrical appliance.
- Do not take a bath.

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

Solution:

A charged balloon is repelled by another charged balloon because both have like charges. On the other hand, an uncharged balloon is attracted by another charged balloon as they have unlike charges.

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

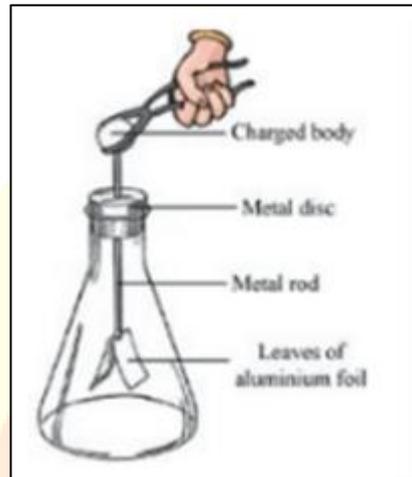
Solution:

An electroscope is a device which can be used to detect the charge on a body. It is based on the principle that like charges repel each other and unlike charges attract each other.

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An electroscope consists of a metal rod. Two leaves of aluminium foil are fixed to one end of the metal rod and a metal disc at the other end.

When a charged body comes in contact with the metal disc, the aluminium leaves move away from each other. This happens because some charge gets transferred to aluminium leaves through the metal rod. The charges on the leaves and the charged body are similar and thus the leaves of aluminium repel each other. If the body is not charged then the leaves attract each other.



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

Solution:

Three states in India where earthquakes are more likely to strike are Assam, Gujarat and Jammu and Kashmir.

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

Solution:

The precautions to be taken to protect oneself from an earthquake are:

- One should move to open spaces.
- One should not take shelter under trees or buildings.
- One should slow down the vehicle if he/she is driving.

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.

Solution:

No, one should not carry an umbrella during a thunderstorm. A thunderstorm is generally accompanied by lightning so the charges might travel from the cloud to the metal rod on the

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umbrella and cause an electric shock to the person carrying it. So, it is not safe to carry an umbrella during lighting.

