CHAPTER -12

SOME NATURAL PHENOMENA

EXERCISES

1 Mark Questions

Q1: Sometimes, a crackling sound is heard while taking off a sweater during winter. Explain.

Answer: When we take out the sweater, the woolen sweater gets charged due to friction between the sweater and the body. This results in a crackling sound.

Q2: Explain why a charged body loses its charge if we touch it with our hand.

Answer: The charges get conducted to the earth through our body when we touch it, and the conductor loses its charge. This phenomenon is known as electric discharge.

Q3: List three states in India where earthquakes are more likely to strike.

Answer: Gujarat, Assam and Jammu & Kashmir are the three states where earthquakes are more likely to strike.

Q4: What is an earthquake?

Answer: An earthquake is a sudden shaking or trembling of the earth.

Q5: What is a Lightning Conductor?

Answer: It's a device that protect buildings from the effect of lightning

Q6: What is the effect of lightning conductor?

Answer: The lightning can be observed by and send to the surface of the land when it's fall on a building.

Q7: How do you determine the intensity of earthquake?

Answer: By using Richter scale we can determine the intensity of earthquake.

Q8: What is static electricity?

Answer: static electricity is an electric phenomenon that involves the transfer of charged practicals from one body to another.

Q9: Name the scientist who first established the relationship between lightning and spark.

Answer: In 1752, Benjamin Franklin, an American scientist, established that lightning and spark from amber was the same thing.

Q10: What is meant by a 'discharged' body?

Answer: The body from which the charge has been earthed loses the charge on it. Such a body is known as a 'discharged' body.

2 Mark Questions

Q1: 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: Richter scale is used to measure the destructive energy of an earthquake. The scale has a reading from 1 to 10.

An earthquake measuring 3 would be recorded by a seismograph.

The magnitude of scale 3 would not cause much damage. An earthquake of magnitude 5 is considered destructive in nature.

Q2: Suggest three measures to protect ourselves from lightning.

Answer: Various ways to protect ourselves from lightning are

(i) Always remain in a closed place, and if you are in a car, stay there until the lightning is over and keep the windows closed.

(ii) Never touch any electrical wires, telephone cables or metal pipes.

(iii) Never bathe in running water; this may cause electric shock.

Q3: Explain why a charged balloon is repelled by another charged balloon, whereas an uncharged balloon is attracted by another charged balloon.

Answer: The surface charge on the balloons is of the same nature; hence, they get repelled. When a charged balloon is brought near an uncharged balloon due to the induction of charges, it acquires charges which are opposite in nature to that of a charged balloon. As unlike charges attract each other, the uncharged balloon gets attracted by the charged balloon.

Q4: Suppose you are outside your home and an earthquake strikes. What precautions would you take to protect yourself?

Answer: The following precautions should be taken when an earthquake strikes:

(a) Find and go to an open field and stay away from buildings, trees, electric wire and poles.

(b) If you are in a car, then drive to an open field and do not come out of your car.

Q5: 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, one should not carry an umbrella during a thunderstorm. The thunderstorm is accompanied by lightning, and the charges might travel from the cloud to the metal rod on the umbrella and might cause an electric shock to the person carrying it. So, it is not safe to carry an umbrella during lightning.

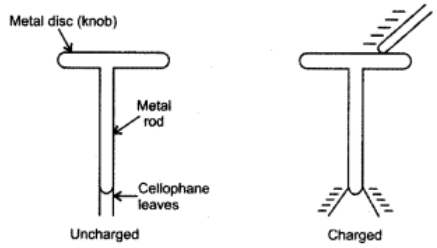
Q6: What is the effect of?

1. **a charged object**
2. **An uncharged object on small bits of paper?**

Answer:

1. A charged object will attract bits of paper.
2. An uncharged object will have no effect on bits of paper.

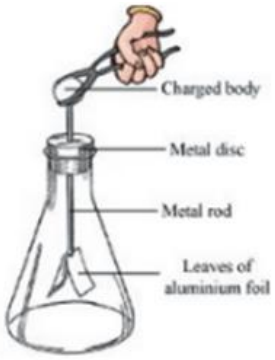
Q7: How will you make an electroscope if the gold leaf electroscope is not at hand?Answer: Take a metallic bar on a stand. Take a strip of cellophane paper and fold it half. Hang it from the metallic bar. This will work like a gold leaf electroscope.



5 Mark Questions

Q1: Describe with the help of a diagram an instrument which can be used to detect a charged body.

Answer:



It consists of a metal rod on which two leaves of aluminum foil are fixed to one end and a metal disc at the other end. The leaves are kept inside a conical flask, and it is corked to isolate them from the atmospheric air.

When a charged body comes in contact with the metal disc, the aluminum leaves move away from each other because some charges get transferred to aluminum leaves through the metal rod. This process is called charging by conduction. The charges on the leaves and the charged body are of the same in nature, and thus, the leaves of aluminum repel each other. If the body is not charged then they would attract each other.

Q2: Why do earthquakes occur?

Answer:

- The earth's crust is made up of fragments called plates, also called tectonic plates.
- These plates are continuously moving.
- Due to continuous motion, these plates slide past or collide with each other.
- The rocks at the boundaries of these plates get interlocked and prevent the plates from moving, which results in pressure being formed on these rocks.
- The increase in pressure leads to the slipping of rocks and causes the rocks to vibrate.

- These vibrations travel up to the surface and cause earthquakes.

Q3: explain the properties of charge?

Answer:

Like charges repel each other. This means that two positive charges repel each other. Similarly, two negative charges would also repel each other.

Unlike charges, they attract each other. This means that a Positive-Negative charge would attract each other.

For example, a charged rubber balloon is repelled by another charged balloon, whereas an uncharged balloon is attracted by another charged balloon.

Like charges repel

Unlike charges attract

Q4: What is Charge? Expalin it's types

Answer: Charge is most commonly used to refer to electric charge. It is a fundamental property of matter like mass. It is a physical property because of which matter experience a force in an electromagnetic field.

Electric charges may be positive or negative in nature. If there is no net electric charge, the matter is considered neutral or uncharged.

Types of charges and their interactions

Charges are of two types

1. **Positive charge –** When the matter has more protons than the number of electrons.

2. **Negative charge –** When the matter has more electrons than protons. A negative charged body has excess of electrons.

Q5: Explain Lightning Conductor?

Answer: A metal rod (generally made of copper) placed on top of tall buildings with its lower end connected to the ground. It is used to protect buildings from the effects of lightning. When lightning strikes, the metal rod, being a good conductor, provides an easy passage for the transfer of charge to the ground. This way, the electric discharge flows from the clouds into the ground without damaging the clouds.

Things to do during lightning

- Switch off the electrical appliances like computer, TV, refrigerator etc.
- If travelling in a car or bus, remains inside the vehicle and shut all its doors and windows.
- Get inside as quickly as possible.
- Check the forecast before going outside in the monsoon.

Things to avoid during lightning.

- Do not roam here when there is lightning.
- Avoid contact with running water.
- Do not lie on the ground.
- Do not sit in open vehicles.
- Do not carry an umbrella.

Fill in the blank

1. A phenomenon that occurs naturally like floods, thunderstorms and lighting is known as _____.

Answer: Natural Phenomena

2. An atom is made of up of positively-charged particle that is found inside the nucleus is called _____.

Answer: Natural Phenomena

3. The molecules that are electrically charged are called _____.

Answer: Ion

4. If body is positively-charged, it has less _____.

Answer: Electrons

5_____ is a device that measures the presence and type of a charge present inside an atom or molecule.

Answer: Electroscope

Multiple Choice Questions

1. Like charges when brought near each other then they
(a) repel
(b) attract
(c) sometimes attract and sometimes repel
(d) have no effect

Answer: (a) repel

2. A device used to test the charge on an object is called
(a) ammeter
(b) electroscope
(c) seismograph
(d) none of these

Answer: (b) electroscope

3. A major earthquake occurred on 8th October 2005 in
(a) Gujarat
(b) Delhi
(c) Haryana
(d) North Kashmir

Answer: (d) North Kashmir

4. A sudden shaking of the earth lasting for a very short time is known as
(a) lightning
(b) thunder
(c) earthquake
(d) Tsunami

Answer: (c) earthquake

5. A major Tsunami occurred in the Indian Ocean on
(a) 26th December 2001
(b) 26th December 2002
(c) 26th December 2003
(d) 26th December 2004

Answer: (d) 26th December 2004

6. Instrument used to find the source of seismic waves is known as
(a) seismometer
(b) voltammeter
(c) galvanometer
(d) ammeter

Answer: (a) seismometer

7. Richter scale is used to measure the magnitude of
(a) lightning
(b) charges
(c) earthquake
(d) rainfall

Answer: (c) earthquake

8. Which of the following cannot be changed easily by friction?
(a) A plastic scale
(b) A copper rod
(c) An inflated balloon
(d) A woolen cloth
Answer: (b) a copper rod

9. 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
Answer: (b) Becomes positively charged while the cloth has a negative charge.

True/False

Tick T for true and F for false in the following statements:

1. Like charges attract each other. (T/F)

2. A charged glass rod attracts a charged plastic straw. (T/F)

3. Lightning conductor cannot protect a building from lightning. (T/F)

4. Earthquakes can be predicated in advance. (T/F)

Answer:

1. False

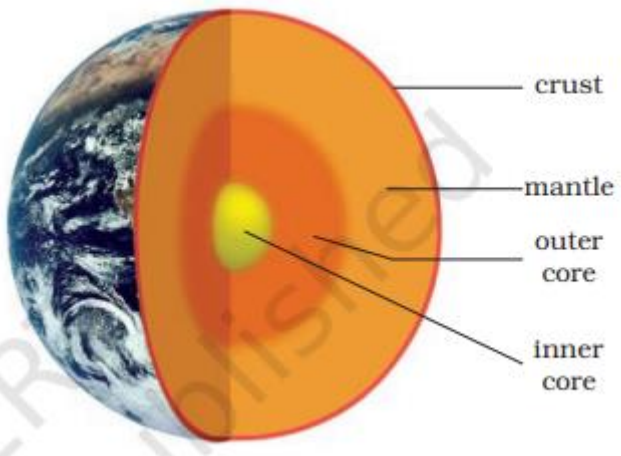
2. True

3. False

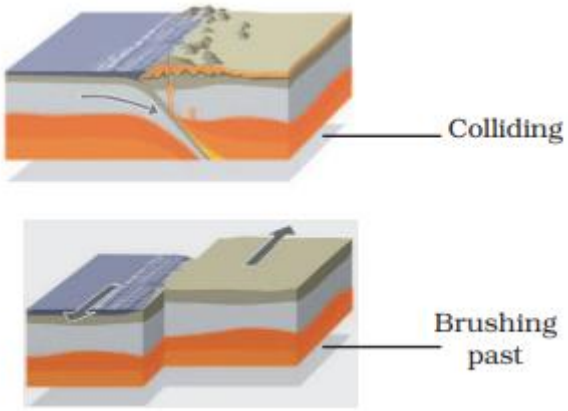
4. False

DIAGRAMS:

Structure of the earth



Movements of earth's plates



SUMMARY

- Positive and negative charges are the two types of charges.
- Unlike charges attract one another while like charges repel one another.
- Static charges are the electrical charges created by rubbing.
- Electric current is made up of moving charges.
- To determine whether a body is charged or not, use an electroscope.
- Lightning is a result of an electric discharge that occurs between clouds and the earth or between various clouds.
- An abrupt shaking or trembling of the earth is referred to as an earthquake.