

## Unit 15(Some Natural Phenomena)

### Multiple Choice Questions (MCQs)

#### Question 1

An electroscope is a device which is used to find if an object is

- (a) charged (b) magnetic (c) free of cracks (d) hot

**Answer.**

(a) An electroscope is a device, which is used to test whether an object is charged or not. It consists of closely placed two metallic strips. When both the strips are charged with similar charges, they repel each other and become wide open.

#### Question 2

Electric current is to be passed from one body to another. For this purpose, the two bodies

- must be joined by (a) cotton thread (b) plastic string  
(c) copper wire (d) rubber band

**Answer.**

(c) Two bodies must be joined by any conducting wire, i.e. copper wire for the flow of current.

#### Question 3

The movement of the earth's plates causes

- (a) cyclones (b) lightning  
(c) earthquake (d) thunderstorms

**Answer.**

(c) When the earth's plates brush past one another or undergo collision, causes earthquake. An earthquake can cause huge damage to buildings, dams, etc.

#### Question 4

Two charged objects are brought close to each other. Choose the most appropriate statement from the following options

- (a) They may attract  
(b) They may repel  
(c) They may attract or repel depending on the type of charges they carry  
(d) There will be no effect

**Answer.**

(c) Two charged objects may attract, if they carry opposite charges, while they repel, if they carry similar charges.

#### Question 5

Which of the following is not likely to cause tsunami?

- (a) A major nuclear explosion under sea  
(b) Earthquake  
(c) Volcanic eruption  
(d) Lightning

**Answer.**

(d) Tsunami refers to the powerful sea waves generated due to the disturbance under the sea. It is not likely to occur in case of lightning, because lightning is an electric spark caused by the accumulation of charges in clouds.

**Question 6**

The earth's plate responsible for causing earthquake is

- (a) the crust of the earth (b) the mantle of the earth  
(c) the inner core of the earth (d) the outer core of the earth

**Answer.**

(a) An earthquake is a sudden shaking or trembling of the earth which lasts for a very short time. It is caused by the disturbance deep down inside the uppermost layer of the earth called the crust.

**Question 7**

Consider the list of terms given below:

- (i) Seismic zone (ii) Fault zone  
(iii) Mantle (iv) Inner core

The boundaries of the earth's plate are known as

- (a) (i) and (ii) (b) (i) and (iii) (c) (iii) and (iv) (d) (ii), (iii) and (iv)

**Answer.**

(a) Since earthquakes are caused by the movement of plates, the boundaries of the plates are weak zones where earthquakes are more likely to occur. These weak zones are also known as seismic or fault zones.

**Question 8**

The outermost layer of the earth is called

- (a) mantle (b) outer core (c) crust (d) inner core

**Answer.**

(c) The outermost layer of the earth is called crust. It is also known as earth's crust.

**Question 9**

Major earthquakes are less likely to occur in

- (a) North-East India (b) Rajasthan (c) Rann of Kutch (d) Orissa

**Answer.**

(d) Major earthquakes are less likely to occur in Orissa. The most threatened areas in India are Kashmir, Western and Central Himalayas, the whole of North-East, Rann of Kutch, Rajasthan and Indo-Gangetic Plane.

**Question10**

Consider the list of terms given below:

(i) Tsunami (ii) Landslides

(iii) Floods (iv) Lightning

Earthquakes can cause

(a) (i), (ii) and (iii) (b) (ii) and (iv) (c) (ii), (iii) and (iv) (d) (iii) and (iv)

**Answer.**

(a) Earthquake is a sudden shaking or trembling of the earth due to the collision between the earth's plates or brushing past of one plate over the other. It can cause Tsunami, floods and landslides.

## Very Short Answer Type Questions

### Question 11

State whether the following statements are True/False

(i) Earthquakes occur anytime all over the world. .

(ii) The plates of the outermost layer of the earth are always in continuous motion.

(iii) Tremors on the earth can also be caused by the eruption of a volcano.

(iv) The process of electric discharge cannot occur between clouds and the earth.

(v) Bathing outdoors should be avoided during thunderstorm.

**Answer.**

(i) True, it is not possible to predict the occurrence of an earthquake.

(ii) True

(iii) True

(iv) False, the process of electric discharge occurs between the earth and the clouds and ultimately, it leads to the lightning.

(v) True

### Question 12

Is it possible to predict the occurrence of an earthquake?

**Answer.**

No, scientists have tried lots of different ways of predicting earthquake but none have been successful so far. They have a pretty good idea of where an earthquake is most likely to hit but they still cannot tell exactly when it will happen.

### Question 13

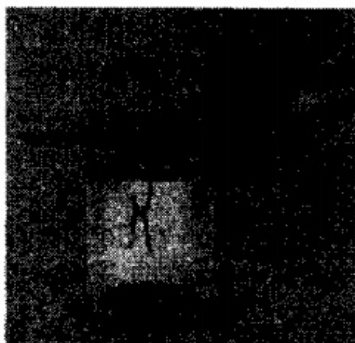
If a charged plastic straw is brought near another uncharged plastic straw, what will happen?

**Answer.**

The charged plastic straw will attract another uncharged plastic straw, when brought near to it because charges of different kind attract each other.

### Question 14

The aluminium strips in an electroscope as shown in figure are replaced by plastic strips and a charged body is brought in contact with the metal clip. What will happen?



**Answer.**

If aluminium strips are replaced by plastic strips, hence no divergence of the strips will take

place, we cannot predict whether the object is charged or not.

### Question 15

Plastic straws A and B are rubbed with dry cotton cloth. What will happen, if they are brought near each other?

#### Answer.

When both the straws are rubbed with a dry cotton cloth, they will acquire the similar charge and hence they will repel each other.

## Short Answer Type Questions

### Question 16

During the construction of a building, the lightning conductor was left hanging in the air by mistake. Would the lightning conductor be still effective? Explain;

#### Answer.

Lightning conductor will not work, if left hanging in the air because in order to work, it must be connected to the ground by using any metal (copper) plate, so that the charge can pass through it to the ground.

### Question 17

If air and cloud were good conductors of electricity, do you think lightning could occur?

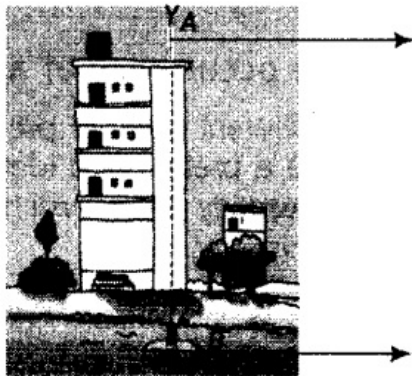
Explain.

#### Answer.

No, there will not be any lightning at all because charge separation cannot take place in conductors. So, all the charges collected at the clouds will continuously transfer through air, i.e. charge will not accumulate on cloud and so, there will be no lightning.

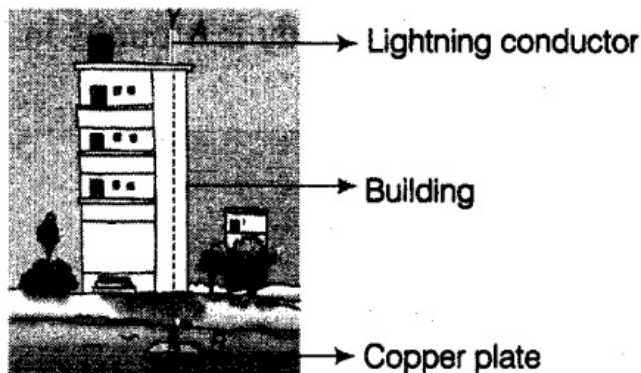
### Question 18

Identify the lightning conductor and the copper plate in figure.



#### Answer.

Lightning conductor (A) is a metallic rod taller than the building, installed in the walls of the building and is connected to the copper plate (S), buried deep in the ground, as shown in figure.



**Question 19**

If the materials used for constructing a building were good conductors, do you think lightning will strike the building. Will the lightning conductor be still required to be installed in the building?

**Answer.**

Lightning will not strike the building because charge separation cannot take place in conductors and so, all the lightning falling on the building will reside on the surface of the building.

So, there is no need of installing any lightning conductor because all the work of lightning conductor is done by the conducting material itself.

**Question 20**

You might have observed on a dry day that when you touch the screen of a television or computer monitor (with picture tube), you get a slight shock. Why does it happen?

**Answer.**

It happens because the television screen or computer monitor are charged and have static charges accumulated on them and when we touch them with our hands which are uncharged, the charges transfer through our hands and we get a slight shock.

**Question 21**

Explain how does lightning conductor protects a building from getting struck by lightning.

**Answer.**

Lightning conductor does not allow the charge to accumulate on a building and transfers all the charges to the earth, protecting the building from being struck by lightning.

**Question 22**

In an electroscope, if a negatively charged body is brought in contact with the metal dip, the strips of the electroscope diverge. If now another charged object carrying equal amount of positive charge is brought in contact with the clip, what will happen?

**Answer.**

If a positively charged object is brought in contact with the metal clip of an electroscope, the negative charge given earlier to the clip will be neutralised and the diverged strips will contract.

**Question 23**

The strips of an electroscope diverge when a charged body is brought in contact with the metal clip. Now the clip is touched gently by our hand. What will happen to the strips? Explain.

**Answer.**

If we touch the strip standing on the ground (not on any insulating base), then the charge on the strip will pass through our hand to the ground and the strips will contract.

## Long Answer Type Questions

**Question 24**

Explain how lightning takes place.

**Answer.**

During the development of a thunderstorm, the air currents move in upward direction while the water droplets move in downward direction. These movements cause separation of charges. The positive charges collect near the upper edges of the clouds and negative charges collect near the lower edges of the clouds.

Accumulation of positive charges near the ground also takes place. When the magnitude of collected charges become large, the air cannot resist their flow and as a result, negative and positive charges meet producing streaks of bright light and sound, called lightning.

**Question 25**

Mention three precautions that you will take to protect yourself if earthquake strikes when you are inside the house.

**Answer.**

Three precautions that we should take if we are inside the house during an earthquake

- (i) We should get under a table or a desk and stay there till the shaking stops.
- (ii) We should pick a safe place where tall and heavy things may not fall on us.
- (iii) If we are in bed, then we should not get up and protect our head with a pillow.

**Question 26**

Explain why it is safer to use a wireless telephone instead of a landline telephone during lightning.

**Answer.**

During lightning, an electric charge may discharge through telephone cords of landline telephone and may become dangerous. Therefore, it is safer to use mobile phones and wireless/cordless phones during lightning.

**Question 27**

What precautions would you take if lightning occurs while you are outside the house?

**Answer.**

Precautions to be taken, while we are outside the house during lightning

- (i) Do not stand underneath a natural lightning rod such as pole or a tall tree.
- (ii) Stand away from any fountain or any other water body.
- (iii) Stay away from tractors or other metal equipments like wire fences, metal pipes, rails, etc.

**Question 28**

If the metal clip used in the electroscope is replaced by an ebonite rod and a charged body is brought in contact with it, will there be any effect on the aluminium strips? Explain.

**Answer.**

No, there will not be any repulsion between the aluminium strips. The charged body will not transfer any type of charge to the ebonite rod as ebonite rod is an insulator. Therefore, there will be no charge on the aluminium strips and no repulsion of the strips will occur.