**GREENWOOD PUBLIC SCHOOL, ADITYAPURAM**

**OUR MOTTO-DEVELOPMENT WITH DELIGHT**

**CLASS-VII SUBJECT- SOCIAL SCIENCE**

**TERM-1 SYLLABUS**

**Geography**

# Chapter 3 - The Movements Of The Earth

#### Question 1:

Which are the three types of plate movements?

#### ANSWER:

The three types of lithospheric plate movements are as follows:

* Divergent plate movement: It occurs when two plates move away from each other.
* Convergent plate movement: It occurs when, due to the forces of compression, two plates move towards each other and they collide.
* Transform plate movement: It occurs when two plates slide past each other.

#### Question 2:

How are rift valleys formed?

#### ANSWER:

A rift valley is formed on a divergent plate boundary when a block of land between two almost parallel faults sinks down. For example, the Narmada Valley in India, lying between the Satpura and Vindhya ranges, is a rift valley.

#### Question 3:

Where are most of the active volcanoes of the world located?

#### ANSWER:

Most of the active volcanoes are located in the Pacific Ring of Fire. This is a circular belt around the Pacific Ocean. The ring of fire coincides with the edges of the Pacific Plate.

#### Question 4:

Which instrument records the tremors of an earthquake?

#### ANSWER:

Seismograph is the instrument that records the tremors of an earthquake. This instrument also helps seismologists to map the interior of the Earth.

#### Question 5:

When did the Bhuj Earthquake occur? What was its magnitude?

#### ANSWER:

The Bhuj Earthquake occurred on the 56thRepublic Day of India, that is, on 26thJanuary 2001. The earthquake occurred at 08:46 in the morning with a magnitude of 7.9 on the Richter scale.

#### Question6:

Vent and crater

#### ANSWER:

|  |  |
| --- | --- |
| **Vent** | **Crater** |
| 1. A passage through which the magma travels to the Earth's surface is known as a vent. | A circular depression of the volcano is called a crater. |
| 2. A vent enables a volcanic eruption. | A crater is formed as a result of a volcanic eruption. |
| 3. A vent has only one opening or a crater. | A crater may have several vents. |

#### Question 7:

Dormant and extinct volcano

#### ANSWER:

|  |  |
| --- | --- |
| **Dormant Volcano** | **Extinct Volcano** |
| 1. Dormant volcanoes are the ones that have not erupted in a long time but may erupt in the future. | Extinct volcanoes are the one that have not erupted in a long time and will never erupt in the future. |
| 2. A dormant volcano has erupted before in the last 10,000 years. | An extinct volcano has not erupted in the last 10,000 years. |
| 3. Examples: Mt. Fujiyama and Mt. Vesuvius | Examples: Mt. Kenya and Mt. Aconcagua |

#### Question 8:

Folding and faulting

#### ANSWER:

|  |  |
| --- | --- |
| **Folding** | **Faulting** |
| 1. Folding occurs when the Earth's rock layers become folded. | Faulting occurs when the Earth's crust gets cracked forming a fault. |
| 2. It happens when two lithospheric plates collide with each other. | It happens when two lithospheric plates move away from each other. |
| 3. Folding occurs when a force of compression is created. | Faulting occurs when a force of tension is created. |
| 4. Fold mountains are formed as a result of folding. Example: The Himalayas | Block mountains and rift valleys are formed as a result of faulting.  Examples: Satpura ranges and the Narmada Valley |

#### Question 9:

Focus and epicentre

#### ANSWER:

|  |  |
| --- | --- |
| **Focus** | **Epicentre** |
| 1. Focus is the location from where the earthquake originates. | Epicentre is the point above the focus on the surface of the Earth. |
| 2. Focus lies inside the Earth's surface. | Epicentre lies on the Earth's surface. |
| 3.It is the place from where the earthquake starts. | It is the place where most of the damage happens due to earthquake. |

#### Question 10:

Formation of block mountains.

#### ANSWER:

Block mountains are formed when the land between the two almost parallel faults is uplifted due to a force of tension exerted during a divergent plate movement. As a result of this tension, the side rocks surrounding the central block go down, leaving the central block of the rock uplifted.

Examples: The Vindhayas and the Satpura ranges in India

#### Question 11:

A quiet volcanic eruption forms lava sheets.

#### ANSWER:

A quiet eruption occurs when the lava oozes out of the Earth's crust instead of coming out in an explosive manner. Quiet eruption causes the lava to flow and cover a large area, thereby creating layers upon layers of lava known as lava sheets.

#### Question 12:

Earthquakes are an environmental hazard.

#### ANSWER:

Earthquakes are the vibrations inside the Earth's crust that happen due to seismic disturbances or volcanic eruptions. Earthquakes are an environmental hazard as they cause widespread distress in the affected area and huge loss of life and property. Earthquakes disrupt telephone lines and transportation modes such as railways and roadways. They often damage national monuments. Buildings collapse due to vibrations and people get buried under the rubble. Electrical wires also get ruptured causing fire to breakout, creating havoc.

#### Question 13:

The Bhuj Earthquake is considered to be an exceptional event.

#### ANSWER:

The Bhuj Earthquake was of 7.9 magnitude on a Richter scale and is considered to be an exceptional event because it occurred at a considerable distance from any plate boundary. Such earthquakes are called intra-plate earthquakes. The Bhuj Earthquake was caused when the force of tension created due to two continental plates rubbing against each other was released.

#### Question 14:

Describe the three types of plate movements. Illustrate with suitable diagrams.

#### ANSWER:

The extreme heat of the core causes the melting of the rocks of the magma. The expansion of these molten rocks pushes the lithospheric plates towards or away from each other. This is known as plate tectonics.

**The three types of plate movements are as follows:**

1. Divergent plate movement: This occurs when two lithospheric plates move away from each other. This causes gaps and cracks at the plate boundaries. Magma from the mantle of the Earth rises through these cracks, cools and solidifies to form a new crust.

2. Convergent plate movement: This occurs when two plates move towards each other and collide due to forces of compression. The collision of two plates causes the formation of mountains.

For example, the convergent movement of the Eurasian and Indian Plates had caused the formation of the Himalayas.

3. Transform plate movement: This occurs when two plates slide past each other. The tremendous friction caused leads to devastating earthquakes.

The diagram of the three movements is given below:

#### Question 15:

What is folding? Explain the landform features produced by folding.

#### ANSWER:

A force of compression is created when two plates collide during a convergent plate movement. As a result, the rock layers of the Earth's crust get folded. This process is called folding. The surfaces that were originally flat become curved as a result of folding. The alternate upfolds that are formed on the rocks are called anticline and the downfolds are called syncline.

The landform features formed as a result of folding are known as fold mountains. These are formed when the rock formations and the crust lift and fold due to the collision of two tectonic plates. The fold mountains that are less rough-looking are formed adjacent to the sharp block mountains formed by faulting. For example, the Himalayas are the fold mountains formed as a result of collision between the Eurasian and the Indian plates.

#### Question 16:

Write a short note on a volcano, explaining its various parts with a help of a diagram.

#### ANSWER:

The magma from the interior of the Earth comes out to the surface through an opening known as volcano.On reaching the Earth's surface, the magma is known as lava, which comes out through a passage known as vent. The top of the mountain through which the volcano erupts has a funnel shaped depression known as a crater.

There can be two types of volcanic eruptions:  
  
(i) An explosive eruption occurs through a narrow vent at one point. Cone-shaped hills are formed when the erupted material accumulates around the vent. Mt Fujiyama in Japan is an example of a cone- shaped hill.  
(ii) A quiet eruption occurs through cracks in the Earth's surface. The lava spreads across a large area and forms lava sheets. This often leads to the formation of plains and plateaus. The Deccan plateau is an example of such a formation.  
  
The diagram that illustrates various parts of a volcano is shown below:

#### Question 17:

Describe the extent of destruction caused by the Bhuj Earthquake.

#### ANSWER:

The Bhuj Earthquake occurred on 26thJanuary 2001. It was a very destructive earthquake of 7.9 magnitude on the Richter scale, with its epicentre in an area called Lodi. This earthquake was devastating as it took lives of many people and caused damage to life and property in Gujarat as well as some parts of Eastern Pakistan. Ahmedabad, the commercial capital of the state, faced the consequences of the earthquake. More than 30,000 people lost their lives and almost 1,50,000 people were injured.  About 40 per cent of the homes, schools, hospitals and the roads in Bhuj were destroyed. Structures and historical monuments were ruined. Infrastructural failure included 60 per cent destruction of food and water supplies. Telephone lines and electricity supply lines were ruined and the total property damage was estimated at 5.5 billion US dollars.

**MCQ:**

#### Question 1:

This is not one of the seven major lithospheric plates  
  
a. Mediterranean Plate  
b. Pacific Plate  
c. African Plate  
d. North American Plate

#### ANSWER:

The correct answer is option **(a)**.

Explanation: Pieces of the Earth's crust and the uppermost mantle that together form the lithosphere are known as tectonic plates or lithospheric plates. Mediterranean Plate is not a tectonic plate. The seven major lithospheric plates are the African Plate, the Eurasian Plate, the Pacific Plate, the North American Plate, the South American Plate, the Antarctic Plate and the Indo-Australian Plate.

#### Question 2:

A good example of a volcano is  
  
a. Mt. Fujiyama  
b. Mt. Everest  
c. Mt. K2  
d. Mt. Nanda Devi

#### ANSWER:

The correct answer is option **(a)**.

Explanation: In an explosive volcanic eruption, the magma flows out of a narrow vent at one point. The lava and other materials like ashes, gases and cinder accumulate around the vent forming a conical hill. Mt. Fujiyama in Japan is an example of such a formation caused by explosive eruption.

#### Question 3:

Folding is caused by a force of  
  
a. gravity  
b. compression  
c. tension  
d. upliftment

#### ANSWER:

The correct answer is option **(b)**.

Explanation: Folding is a result of the force of compression when two lithospheric plates collide during a convergent plate movement. This causes the lifting and folding of the rock layers on the Earth's crust leading to the formation of fold mountains.

#### Question 4:

The magnitude of a very destructive earthquake is  
  
a. 4-5  
b. 7 or above  
c. 6-7  
d. below 3

#### ANSWER:

The correct answer is option **(b)**.

Explanation: The magnitude of an earthquake is measured by a Richter scale. The numbers on the scale range between 1 to 9. Earthquakes of magnitude 7 or above are destructive and can cause extreme damage to life and property.

#### Question 5:

The displacement of rock strata on either sides of a crack results in  
  
a. transform plate movement  
b. folding  
c. divergent plate movement  
d. faulting

#### ANSWER:

The correct answer is option **(d)**.

Explanation: When two lithospheric plates move away from each other during a divergent plate movement, a tension is caused that creates a crack on the Earth's crust. Faults are created due to the displacement of rock strata on either sides of the crack. This is known as faulting. Landform features that are formed as a result of faulting are block mountains and rift valleys.

# Chapter 4 - Landforms Of The Earth

#### Question 1:

What is gradation? What are the two types of forces that bring about gradation?

#### ANSWER:

The breaking down, transportation and deposition of rock minerals leading to the leveling of the Earth's surface is known as gradation

**The two forces that bring about gradation are as follows:**

1. Internal forces: These are the forces that act from within the Earth's surface. For example, volcanos and earthquakes
2. External forces: Such forces act over the Earth's surface. For
3. example, winds and waves

#### Question 2:

What is weathering?

#### ANSWER:

Weathering is a process in which huge rocks are broken down or decomposed into fine material. Several forces are responsible for this process. The most common agents of weathering are plants, animals and winds.

#### Question 3:

What is a gorge? Give an example.

#### ANSWER:

A gorge is an I-shaped, narrow and deep valley formed by a river when it erodes the rocks vertically. Indus and Brahmaputra rivers form deep gorges when they cut across the Himalayan ranges.

#### Question 4:

How is a waterfall formed?

#### ANSWER:

Waterfalls are an example of spectacular landforms formed by the rivers in mountains. They are formed in two ways:

1. When the slope of a river bed drops down all of a sudden, the water plunges down from the mountain in the form of a magnificent waterfall.
2. Faulting may also result into a break in the land surface and hence, the slope of the river bed drops and results into waterfall.

#### Question 5:

What is a delta? Name the biggest delta in the world.

#### ANSWER:

Delta is a triangular landform that a river forms near its mouth (where it meets the ocean or sea). Since the river deposits most of its sediments near the mouth, these deposited sediments force the river to split into several distributaries and this region is collectively known as Delta.

The Ganga-Brahmaputra Delta is the biggest delta in the world.

#### Question 6:

What are moraines?

#### ANSWER:

The rock material deposited alongside the valley due to the melting of glaciers is known as moraine or glacial moraine*.*It is composed of debris varying in size, ranging from fine silt to large stones or boulders.

#### Question 7:

What are mushroom rocks?

#### ANSWER:

Due to the action of strong winds carrying dust particles, sand and gravel, the erosion of rocks takes place. Since the wind is unable to carry dust particles at great height, it erodes the lower part of rocks more than the upper part. This results into a relatively narrow base and extensive top of the rocks, resembling the shape of a mushroom. Hence, these rocks are known as mushroom rocks*.*

#### Question 8:

How is a sand dune formed?

#### ANSWER:

Sand dunes are formed when an obstacle comes in the path of the movement of sand-carrying winds. The coarse sand particles get deposited in the form of a hillock or mound with its windward side as gentle and leeward side as steep. Sand dunes vary in height, ranging from few metres to several hundred metres.

#### Question 9:

What are lagoons? Give an example?

#### ANSWER:

Lagoon is a very common coastal feature found all over the world. It is formed when a shallow water body is separated from sea water or any large water body by a small land mass, resulting in the formation of a relief feature that resembles a partially enclosed lake.

#### Question 10:

Name two sea beaches of India.

#### ANSWER:

Beaches are formed when tides leave sand, gravel and pebbles on the shore and they get deposited over a long period of time. India has an incredibly long coastline and hence, there are large number of beautiful beaches in the country.

Following are the names of two beaches of India:

1. Kovalam beach: It is a white, sandy beach on the Malabar coast in Kerala.
2. Varca beach:It is a long strip of land in Goa with quiet and calm atmosphere.

#### Question 11:

Degradation and aggradation

#### ANSWER:

The process of levelling of the surface of the Earth is known as gradation. This results from a range of factors like waves, glaciers and running water. These factors are cumulatively referred as agents of gradation.

Degradation is the process of reduction in height of various landforms resulting from the action of several agents of gradation by breaking down the rocks into small fragments. Aggradation, on the other hand,is the increase in height of a landform that results from the deposition of rock fragments in low lying areas.

Hence both these processes maintain balance of the Earth's surface.

#### Question 12:

Weathering and erosion

#### ANSWER:

|  |  |
| --- | --- |
| **Weathering** | **Erosion** |
| Weathering is the process of decomposition of rocks resulting from the loosening of rock particles. | When the disintegrated particles formed due to weathering start moving from one place to another then it is known as erosion. |
| There are several agents of weathering like heat, cold, chemical factors and water. | Agents responsible for erosion and deposition of particles from one place to another are glaciers, sea waves, running water, wind, etc. |
| This process does not involve the movement of particles form one place to another. | The second stage of weathering is known as erosion (the movement of particles and their deposition). |
| No new landform is created as a result of weathering. | New landforms are created due to erosion, for example, sand dunes. |

#### Question 13:

Tributary and distributary

#### ANSWER:

Tributaries and distributaries are streams of fresh water bodies varying in their direction of flow. Tributaries are  small streams of water that join the mainstream river to increase its water supply. They originate from glaciers, lakes and underground water streams. They join the river during its course mostly in its middle and younger stage. Distributaries, on the other hand,  occur as a result of branching of a river near its mouth at a low-lying delta region. River carries a huge amount of silt and gravel at it mouth and this enhanced volume results into the branching of the river from it main channel. These streams are known as distributaries.

#### Question 14:

A river flows very slowly as it approaches the sea.

#### ANSWER:

The place where a river meets the sea or any other water body is known as its mouth. By the time the river reaches its mouth, it is carrying with it a large amount of silt, alluvium and water that reduces its speed.

#### Question 15:

Wind erosion is more prominent in the deserts.

#### ANSWER:

Winds that carry with themselves a huge amount of sand, dust particles and gravel are a strong agent of erosion. Deserts, due to lack of vegetation, are more prone to erosion. The absence of vegetation, which holds the land firmly, results in the sand laying loose that causes the erosion.

#### Question 16:

Describe the landforms formed by a river in the plains.

#### ANSWER:

Major landforms formed by a river in plains are as follows:

1. **Meanders**:When the river enters the plain, it losses it swiftness and the valley widens due to the continuos erosion of banks of the river. The river makes several bends along its flow and these bends and loops are termed as meanders.  
  
2. **Ox-bow lakes**: As a result of continuos flow of the river, in the long run, the bends and loops come closer and with time, the river cuts across the loops separating them from the mainstream. These circular loops that get separated from the mainstream are termed as ox-bow lakes.

3. **Flood plains**: During floods, rivers bring with them a huge amount of silt and alluvium that gets deposited along the bank of rivers raising their height and forming fertile flood plains.

4. **Natural levees​**: Long ridges with relatively lesser height formed at the bank of rivers are termed as natural levees due to the coarse material deposited by the river.  
  
5. **Sand bars**: These are the landforms formed inside the river at the mouth by deposition of large volume of sand, pebbles, alluvium and water.

6. **Distributaries**: Due to excessive load of water and silt at the mouth of river, the mainstream gets divided into several small channels of water known as distributaries.  
  
7. **Deltas**: When soil  gets deposited between the distributaries in a triangular form, it is referred to as Delta. Deltas are very fertile lands found at the mouth of the river. For example, the Ganga-Brahmaputra delta is a very fertile delta found in West Bengal.

#### Question 17:

How do sea waves modify the coastal regions?

#### ANSWER:

Sea waves are an important agent of erosion along with currents, storms and tides. But this erosion is mainly confined to sea coast only and results into several coastal landforms. Some of them can be understood with following points:  
  
1. **Sea caves**: Due to the action of strong waves, the rock surface gets disintegrated and develops cavities. With time and continuos action of these sea waves, such cavities get enlarged and mould into cave-like structures referred to as sea caves.

2.**Sea arch**: When a single standing rock in the sea is faced with strong waves, its middle portion gets eroded. This forms a door  passage or an arch-like structure known as sea arch.

3.**Stacks**: As a result of the continuos action of sea waves over a long period of time, the roof of the sea arch also gets eroded leaving behind only the pillars known as stacks.

4. **Sea cliff**: When a sea wave strikes the surface of rock facing the sea for a long period, it erodes its roughness making it very sharp and steep towards the side of the sea. These landforms are referred as sea cliffs.

5. **Beach**: When the sea is calm, it deposits the silt, alluvium, sand and gravel that it brought with itself along the seashore. This results into the formation of long beaches.   
  
6. **Lagoon**: A partially enclosed lake formed when the sea water is trapped between the sea coast and sand bar is known as a lagoon. (Sand bars are the landforms formed inside the river at the mouth by deposition of a large volume of sand, pebbles, alluvium and water.)

**MCQ:**

#### Question 1:

Which of the following features is not formed by a river in the mountains?  
  
a. gorge  
b. canyon  
c. meander  
d. waterfall

#### ANSWER:

The correct answer is option (c).  
  
Explanation:Except meanders, all the other three features are formed in the mountains. Meanders are formed by the rivers in plains. They are the loops and curves that are formed by the rivers during their flow in the plains.

#### Question 2:

A valley formed by a glacier resembles the letter  
  
a. V  
b. U  
c. I  
d. L

#### ANSWER:

The correct answer is option (b).  
  
Explanation: A glacier forms a valley with steep sides and flat bottom by eroding rock minerals. This valley resembles the English alphabet 'U'  and hence, is known as the U-shaped Valley.

#### Question 3:

Loess is a type of  
  
a. soil  
b. rock  
c. lake  
d. sand dune

#### ANSWER:

The correct answer is option (a).  
  
**Explanation:** Loess is a fine silted soil formed by the deposition of dust brought by the action of winds. It can be very fertile under favourable climatic conditions.

#### Question 4:

Which of the following lakes in India is a lagoon?  
  
a. Wular  
b. Sambhar  
c. Govind Sagar  
d. Chilka

#### ANSWER:

The correct answer is option (d).

Explanation: Chilka, a salt water lake of Orissa, is a very large lagoon. Wular, on the other hand, is a fresh water lake of Jammu & Kashmir, Sambhar is an inland salt lake of Rajasthan and Govind Sagar is a man-made reservoir in Himachal Pradesh.

# Chapter 5 - Composition And Structure Of The Atmosphere

#### Question 1:

Name the five layers of the atmosphere?

#### ANSWER:

The atmosphere of the Earth is divided into five layers based on their properties like composition, temperature and so on. Their names are as follows:

1. Troposphere
2. Stratosphere
3. Mesosphere
4. Thermosphere
5. Exosphere

#### Question 2:

How is the troposphere important for us?

#### ANSWER:

Troposphere is the densest layer of atmosphere that is composed of water vapour, dust particles and many other impurities. Due to this thickness, troposphere absorbs most of the heat radiated by the Earth's surface, thereby, maintaining the temperature of the surface. Also, this layer is characterised with several weather phenomena like cloud formations and thunderstorms.

#### Question 3:

What do you mean by the normal lapse rate of temperature?

#### ANSWER:

In troposphere, with increase in height, the density of air decreases and the temperature also starts falling. For every 165 metres, there occurs a 1 oC fall in temperature and this is known as the normal lapse rate of temperature.

#### Question 4:

What is the significance of the ozone layer?

#### ANSWER:

The ozone layer present in stratosphere is of great significance to human survival on the Earth. Ozone layer prevents the harmful ultraviolet radiation of the Sun from reaching the Earth's surface. If these rays would come to us directly, then they will cause problems like temperature rise and cancer.

#### Question 5:

Which layer of the atmosphere makes radio communication possible?

#### ANSWER:

The thermosphere layer of the atmosphere makes the radio communication possible on Earth. This layer is composed of several ions that reflect the radio waves back to Earth, making it possible to have wireless communication.

#### Question 6:

Troposphere and stratosphere

#### ANSWER:

|  |  |
| --- | --- |
| **Troposphere** | **Stratosphere** |
| It is the lowest layer of the Earth's atmosphere. | It is the second layer from the surface of the Earth. |
| It extends up to a height of 8 km at the poles and 18 km at the Equator. | This layer extends up to a height of 50 km from the Earth's surface. |
| Temperature decreases with increasing height. | At the lower surface, temperature is constant and with increase in height, temperature also increases. |
| Weather phenomena are witnessed hence, the air is turbulent due to thunderstorms and clouds. | There is absence of dust particles and clouds; therefore, the air is calm, thereby, providing smooth passage to aeroplanes. |

#### Question 7:

Mesosphere and thermosphere

#### ANSWER:

|  |  |
| --- | --- |
| **Mesosphere** | **Thermosphere** |
| This layer extends to a height of 80 km from the the Earth's surface. | This layer extends to a height of 450 km from the Earth's surface. |
| Temperature decreases with increase in height. | Temperature increases with increase in height. |
| The layer separating mesosphere and stratosphere is called stratopause. | The layer separating thermosphere and mesosphere is called mesopause. |
| Mesosphere lies above stratosphere. | Thermosphere lies above mesosphere. |

#### Question 8:

Tropopause and stratopause

#### ANSWER:

Tropopause: It is a thin layer that acts as a boundary between troposphere and stratosphere.  
  
Stratopause: It is a thin layer separating stratosphere and mesosphere.

#### Question 9:

About 99% of the total mass of the atmosphere lies within a height of 32 km from the earth's surface.

#### ANSWER:

With the increase in height, a reduction in density of air is witnessed. All the layers of atmosphere rest on one another and the upper layer constantly exerts pressure upon the lower layer. This increases the compactness of air near the Earth's surface. This is the reason that almost 99% of the total atmospheric mass lies within the height of 32 km from the Earth's surface.

#### Question 10:

Air temperature decreases with increasing height in the troposphere.

#### ANSWER:

In troposphere, with increasing height, the density of air decreases and the temperature starts falling. This decrease in temperature is because of the phenomenon called normal lapse rate of temperature, that is, for every 165 metres, there occurs a fall in temperature of 1 oC.

#### Question 11:

The thermosphere is also called ionosphere.

#### ANSWER:

The layer present right above the mesosphere extending to a height of 450 km is the thermosphere. This layer is composed of electrically charged ions that are responsible for reflecting the radio waves back to the Earth's surface. Due to the presence of these ions, thermosphere is also known as ionosphere.

#### Question 12:

With the help of a diagram describe the composition of atmosphere.

#### ANSWER:

Atmosphere of the Earth is composed of a large number of gases.It also includes dust particles, water vapour, pollen grains and other impurities like smoke and chemicals. They vary in their composition.

Nitrogen, which comprises 78% of the Earth's atmosphere, is a very essential element for maintaining the fertility of the soil along with the growth of plants and animals.

Oxygen, which is a life-giving gas, comprises 21% of the Earth's atmosphere.   
  
Carbon dioxide is needed by plants to make their own food. It also helps in maintaining the temperature of the Earth surface by absorbing the heat radiated from the Earth surface. Its composition is merely 0.03%, which is increasing day-by-day.  
  
Other gases like argon, helium and neon and water vapour and dust particles covers the remaining 1% of the atmospheric composition.

The composition of atmosphere can be better understood with the help of the following diagram:

#### Question 13:

Draw a labelled diagram of the structure of the atmosphere and write about the characteristics of its different layers.

#### ANSWER:

The atmosphere is divided into various layers that lie on one another and exert pressure on the layer lying below it. They are as follows:

1. **Troposphere**: It is the lowest layer of the Earth's surface that extends to a height of 8 km at the poles and 18 km at the Equator. This layer is characterised with weather phenomenon like cloud formation, thunderstorms, rainfall and snowfall. Here, temperature decreases with the increase in height.  
  
2. **Stratosphere**: This layer extends to a height of 50 km from the surface. Temperature increases with increase in height, and this layer is comparatively calm, making the conditions favourable for the movement of aircraft. Here, the presence of ozone layer is witnessed, which protects the Earth from harmful ultraviolet rays.  
  
3. **Mesosphere**: This layer extends to a height of around 80 km from the Earth's surface. Here, the temperature starts decreasing with the increasing height.  
  
4. **Thermosphere**: In this layer of atmosphere, the electrically charged ions are present that reflects the radio waves back to the Earth making the communication process possible on the Earth. This layer extends up to a height of around 450 km. It is also known as ionosphere.

5. **Exosphere**: This layer extends to a height of around 1,600 km and beyond that, it merges with the interplanetary space.

The layers can be understood with the help of below mentioned diagram:  
  
**Question 14:**

How is the atmosphere useful to us?

#### ANSWER:

The usefulness of the atmosphere can be understood with the below mentioned points:

* The components of atmosphere have a great utility. For example, nitrogen, the most important component of the atmosphere, is needed for the growth of plants and for the fertility of soil.
* Oxygen is a life-giving gas, which is the pre-requisite for human life on the Earth.
* Carbon dioxide is needed by plants to make their own food. It also helps in maintaining the temperature of the Earth's surface by absorbing the heat radiated from the Earth surface.
* The water vapour present in the atmosphere helps in bringing rainfall on Earth.
* Ozone layer protects the Earth from harmful ultraviolet rays emitted from the Sun.
* Even the dust particles are useful to us since they act as the base during condensation to form water droplets.

**MCQ:**

#### Question 1:

The lowest layer of the atmosphere is  
  
a. mesosphere  
b. stratosphere  
c. troposphere  
d. thermosphere

#### ANSWER:

The correct answer is option **(c)**.  
  
**Explanation**: Troposphere is the lowest layer of the Earth's atmosphere extending to a height of 8 kilometres at the poles and 18 kilometres at the Equator.

#### Question 2:

The uppermost layer of the atmosphere is  
  
a. troposphere  
b. exosphere  
c. mesosphere  
d. ionosphere

#### ANSWER:

The correct answer is option **(b).**  
  
**Explanation**: This layer extends to a height of around 1,600 kilometres and it further merges with the outer space making it difficult to know much about the layer.

#### Question 3:

The approximate height of the atmosphere is  
  
a. 1200 km  
b. 1400 km  
c. 1500 km  
d. 1600 km

#### ANSWER:

The correct option is **(d)**.  
  
**Explanation**: The uppermost layer of the Earth's atmosphere, that is, the exosphere extends up to a height of 1,600 km and beyond this point, the atmosphere merges with the interplanetary space.

#### Question 4:

All weather phenomena take place in the  
  
a. troposphere  
b. stratosphere  
c. mesosphere  
d. thermosphere

#### ANSWER:

The correct answer is option **(a)**.  
  
**Explanation**: Troposphere is the lowest layer of the Earth's atmosphere where all weather phenomena like formation of clouds, thunderstorms, rainfall and snowfall occur.