

CHAPTER 5

MAJOR DOMAINS OF THE EARTH

2Marks Questions:

1. What are the four major domains of the earth?

Answers:

Major Domains of the Earth

- Lithosphere
- Atmosphere
- Hydrosphere
- Biosphere

2. Name the major continents of the earth.

Answers: Major continents of the Earth

- Asia
- Europe
- Africa
- North America
- South America
- Australia
- Antarctica

3. Name the two continents that lie entirely in the Southern Hemisphere.

Answers: Two continents lying entirely in the Southern hemisphere are:

- Australia and
- Antarctica

4. Name the different layers of the atmosphere.

Answers: Layers of (the) Atmosphere

- Troposphere
- Stratosphere
- Mesosphere
- Thermosphere
- Exosphere

5. Why is the earth called the ‘blue planet’?

Answers:

The Earth is called the blue planet because,

- it is the only planet (so far) which has water,
- it looks blue from the sky because of presence of water on it.

6. Why is the Northern Hemisphere called the land Hemisphere?

Answers:

The Northern Hemisphere is called the Land Hemisphere because of the following reasons:

- Greater part of the landmass lies in the Northern Hemisphere. It is more than 70% of the total area.
- Water bodies area is smaller in this Hemisphere. It is only 30% of the total area of the Northern Hemisphere.

7. Why is the biosphere important for living organisms?

Answers:

Importance of Biosphere

- Biosphere sustains all life forms.
- It provides food to them.
- It provides stage to all forms of life to act upon.
- It should be pollution free because pollution is injurious to life forms.

4Marks Questions:

1. Mention the three main components of the environment.

Answer: The three main components of the environment are – the lithosphere, the atmosphere and the hydrosphere. The lithosphere is the solid portion of the earth. The gaseous layers that surround the earth is the atmosphere. The atmosphere is made up of oxygen, nitrogen, carbondioxide and other gases. The hydrosphere refers to the big area of water that covers the earth's surface. This water is in the forms of ice, water and water vapour.

2. Write a short note on the 'hydrosphere'.

Answer:

The hydrosphere refer to the water bodies that are found on the earth's surface. More than 71% of the earth is covered with water. This water is found in all its forms—ice, water and water vapour. Running water in oceans and rivers and in lakes, ice in glaciers, underground water and the water vapour in atmosphere. More than 97% of the earth's water is found in oceans. The ocean water is very salty, hence not of human utility. A large proportion of the rest of water is in the form of the icesheets and glaciers or under the ground. A very small percentage (0.03%) is available as fresh water. It is this water that we use.

3. Explain biosphere—the domain of life.

Answer:

The biosphere is a narrow zone of the earth where land, water and air interact with each other to support life. It is in this zone that life exists. There are several species of organisms that vary in size from microbes and bacteria to large mammals. All living organisms including humans are linked to each other and to the biosphere for survival.

4. Give an account of the composition of the atmosphere. Also, discuss the importance of the components.

Answer:

The atmosphere is composed mainly of nitrogen and oxygen. Together they make up about 99% of clean, dry air. Nitrogen 78% and oxygen 21%. Apart from these two major gases, there are other gases too in the atmosphere. These gases include carbon dioxide, argon and others comprise 1% by volume. Oxygen is the breath of life while nitrogen helps in the growth of living organisms.

5.Explain the concept of the Biosphere and its significance in the context of the Earth.

Answer:The Biosphere is the narrow zone where land, water, and air intersect, creating an environment suitable for life. It encompasses all living organisms on Earth, ranging from microscopic bacteria to large mammals, including humans. The significance of the Biosphere lies in its role as the domain where unique life forms exist and interact. It supports various ecosystems and is crucial for the survival of all organisms. The balance within the Biosphere is essential for maintaining environmental stability, and human activities impact this balance. Understanding and preserving the Biosphere is crucial for sustainable living on Earth.

6. Differentiate between the Troposphere and the Thermosphere in the Earth's atmosphere.

Answer:The Earth's atmosphere is divided into layers, and two of these layers are the Troposphere and the Thermosphere.
Troposphere:Location: The Troposphere is the lowest layer, extending from the Earth's surface up to about 8-15 kilometers.

Temperature: Temperature decreases with altitude in the Troposphere.
Weather Events: All weather events, including clouds, rain, and storms, occur in this layer.
Air Pressure: Air pressure is the highest at the surface and decreases with height.

Thermosphere:Location: The Thermosphere is located above the Troposphere and extends to about 600 kilometers and beyond.

Temperature: Temperatures in the Thermosphere increase significantly with altitude.

Composition: This layer is characterized by a low density of air molecules.

Ionization: It is the layer where the ionization of atoms occurs, leading to the presence of the ionosphere.

In summary, the Troposphere is where weather phenomena occur, and temperatures decrease with height, while the Thermosphere is characterized by high temperatures and plays a role in ionization processes.

7Marks Questions:

1. Give the details of all the major continents.

Answer: There are seven major continents—Asia, Europe, Africa, North America, South America, Australia and Antarctica.

1. Asia is the largest continent. It covers about one-third of the total land area of the earth. It lies in the Eastern Hemisphere. The Tropic of Cancer passes through this continent. Asia is separated from Europe by the Ural mountains on the west. The combined land mass of Europe and Asia is called Eurasia (Europe + Asia).

2. Europe. This continent lies to the west of Asia. The Arctic circle passes through it. It is bound by water bodies on three sides.

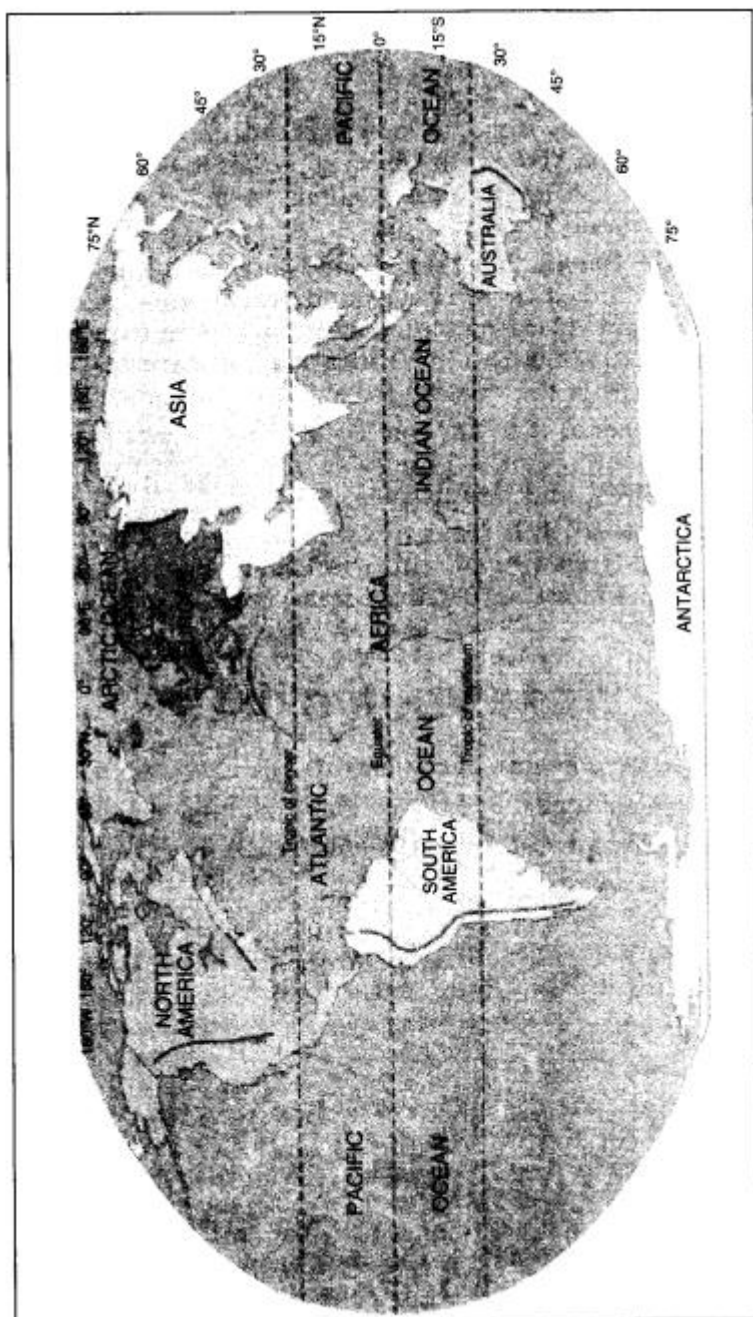
3. Africa. It is the second largest continent after Asia. The Equator or 0° latitude runs almost through the middle of the continent. A large part of Africa lies in the Northern Hemisphere. It is the only continent through which the Tropic of Cancer, the Equator and the Tropic of Capricorn pass. It is bound on all sides by oceans and seas. The world's largest hot desert, i.e. the Sahara Desert lies in this continent. The world's longest river the Nile flows through it.

4. North America. It is the third largest continent of the world. It is linked to South America by a very narrow strip of land called the Isthmus of Panama. This continent lies completely in the Northern and Western Hemisphere.

5. South America. It lies mostly in the Southern Hemisphere. The Andes, world's longest mountain range, runs through its length from north to south. The world's largest river, the Amazon flows through this continent.

6. Australia. It is the smallest continent. It lies entirely in the Southern Hemisphere.

7. Antarctica. It lies completely in the Southern Hemisphere. It is a large continent. The South Pole lies almost at the centre of this continent. It is permanently covered with thick ice sheets because it is located in the South Polar region. Permanent human settlement is not found here.



2. Describe the major oceans of the Earth and explain one significant feature of each.

Answer:The Earth has five major oceans, each with distinct characteristics:

Pacific Ocean:Significant Feature: It is the largest ocean, covering approximately one-third of the Earth's surface.

Additional Information: The Mariana Trench, the deepest part of the Earth, is located in the Pacific Ocean.

Atlantic Ocean:Significant Feature: The Atlantic Ocean is the second-largest ocean and has an 'S' shape.

Additional Information: It is flanked by the Americas on the western side and Europe and Africa on the eastern side, with a highly indented coastline.

Indian Ocean:Significant Feature: It is the only ocean named after a country, India.**Additional Information:** The shape of the Indian Ocean is almost triangular, bordered by Asia to the north, Africa to the west, and Australia to the east.

Southern Ocean:Significant Feature: It encircles Antarctica and extends northward to 60 degrees south latitude.**Additional Information:** The Southern Ocean is less recognized than the other oceans but plays a crucial role in circumpolar ocean currents.

Arctic Ocean:Significant Feature: It surrounds the North Pole and is located within the Arctic Circle.

Additional Information: The Arctic Ocean is connected to the Pacific Ocean by the Bering Strait and is bound by the northern coasts of North America and Eurasia.Each ocean contributes uniquely to the Earth's hydrosphere, influencing global climate and weather patterns.

3. Discuss the challenges posed by human activities on the Biosphere and suggest measures for environmental sustainability.

Answer:

Human activities have significantly impacted the Biosphere, leading to environmental challenges. Deforestation, pollution, and climate change are some of the issues. To ensure environmental sustainability, several measures can be adopted:

Afforestation and Reforestation: Planting trees and restoring forests help counter the effects of deforestation, maintaining biodiversity and ecosystem balance.

Waste Management: Proper disposal and recycling of waste reduce pollution and prevent the degradation of land, water, and air in the Biosphere.

Renewable Energy: Shifting to renewable energy sources reduces the reliance on fossil fuels, decreasing air pollution and mitigating climate change.

Conservation of Water Resources: Responsible use of water resources, preventing contamination, and promoting water conservation practices are essential for sustaining the Biosphere.

Environmental Education: Creating awareness and educating people about the importance of the Biosphere and sustainable practices is crucial for fostering a sense of responsibility towards the environment.

Multiple Choice Questions

1) Life exists in this zone:

- | | |
|-----------------|-----------------|
| (a) Lithosphere | (b) Biosphere |
| (c) Hydrosphere | (d) Atmosphere. |

2) It is the only continent through which the tropic of Cancer, the Equator, and the Tropic of Capricorn pass:

- | | |
|------------|--------------------|
| (a) Asia | (b) Europe |
| (c) Africa | (d) North America. |

3) It is the world's longest mountain range

- | | |
|-------------------------|------------------------|
| (a) The Mt. Everest | (b) The Ural Mountains |
| (c) The Karakoram range | (d) The Andes. |

4)Which ocean is 'S' shaped?

- | | |
|-----------------------|------------------------|
| (a) The Pacific Ocean | (b) The Atlantic Ocean |
| (c) The Indian Ocean | (d) The Arctic Ocean. |

5) Which one is not the layer of the Atmosphere?

- | | | |
|----------------------|---------------------|---|
| (a) The Biosphere | (b) The Troposphere | • |
| (c) The Stratosphere | (d) The Mesosphere. | |

Answers:

- 1) — (b)**
2) — (c)
3) — (d)
4) — (b)
5) — (a)

Fill in the Blanks

1. The South Pole lies almost at the centre of.....
2. Africa is the second largest continent after
3. The world's longest river the Nile flows through
.....
4. The hydrosphere comprises water in the form of
....., water and
5. The Arctic Ocean is connected with the Pacific Ocean by a
narrow stretch of shallow water known as
6. The is the solid outermost shell of the Earth, including
the landforms, continents, and ocean floor.
7. The is the gaseous envelope surrounding the Earth,
consisting of various layers like the troposphere and stratosphere.
8. The _____ comprises all the water on Earth, including oceans,
seas, lakes, rivers, groundwater, and even water vapor.

Answers:

1. Antarctica
2. Asia
3. Africa
4. ice, water vapour
5. Bering Strait
6. Lithosphere
7. Atmosphere
8. Hydrosphere

Summary:

The lesson "Major Domains of the Earth" explores the fundamental geographical divisions of the Earth's surface, focusing on four major domains: the lithosphere, hydrosphere, atmosphere, and biosphere.

1. Lithosphere:

Definition: The solid outer layer of the Earth, consisting of the crust and uppermost part of the mantle.

Characteristics: Varied landforms, such as mountains, plains, and plateaus, are part of the lithosphere.

Significance: It serves as the foundation for terrestrial life and includes the Earth's continents and ocean basins.

2. Hydrosphere:

Definition: The total water component on Earth, encompassing oceans, seas, rivers, lakes, groundwater, and atmospheric water vapor.

Characteristics: Oceans cover the majority of the Earth's surface, and water is crucial for supporting life and shaping landscapes.

Significance: The hydrosphere plays a vital role in regulating climate, influencing weather patterns, and sustaining ecosystems.

3. Atmosphere:

Definition: The gaseous envelope surrounding the Earth, primarily composed of nitrogen, oxygen, carbon dioxide, and other trace gases.

Characteristics: Layers of the atmosphere, including the troposphere and stratosphere, influence weather, climate, and air circulation.

Significance: The atmosphere protects life on Earth by absorbing harmful solar radiation and maintaining suitable temperatures.

4. Biosphere:

Definition: The region on Earth where living organisms exist, including the interaction between living organisms and their environment.

Characteristics: Diverse ecosystems, from forests to deserts, are part of the biosphere, supporting a wide range of plant and animal life.