UNIQUE STUDY POINT

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Class: VI	**Subject:** Science	**Session:** 2025-26
Chapter: 02 - Oceans and Continents	**Time:** 1½ Hours	**Max. Marks:** 40

General Instructions:

1. All questions are compulsory.
2. This question paper contains 20 questions divided into five sections A, B, C, D and E.
3. Section A contains 10 MCQs of 1 mark each.
4. Section B contains 4 questions of 2 marks each.
5. Section C contains 3 questions of 3 marks each.
6. Section D contains 1 question of 5 marks.
7. Section E contains 2 Case Study Based questions of 4 marks each.

SECTION A - Multiple Choice Questions (1 mark each)

Q1. What are all the oceans on Earth collectively called?

(a) Global ocean

(b) World ocean

(c) Interconnected ocean system

(d) All of the above

Q2. Which ocean is located around the North Pole?

(a) Pacific Ocean

(b) Atlantic Ocean

(c) Arctic Ocean

(d) Southern Ocean

Q3. In which group of islands is Lakshadweep located?

(a) Bay of Bengal

(b) Arabian Sea

(c) Pacific Ocean

(d) Indian Ocean central region

Q4. What did early astronauts call Earth?

(a) The green planet

(b) The blue planet

(c) The water world

(d) The living planet

Q5. Which continent lies entirely in the Southern Hemisphere?

(a) South America
(b) Africa
(c) Australia
(d) Antarctica

Q6. What percentage of the world's oxygen is produced by oceans?
(a) About 25%
(b) About 40%
(c) More than half
(d) About 10%

Q7. Which ocean separates Europe from the Americas?
(a) Pacific Ocean
(b) Atlantic Ocean
(c) Indian Ocean
(d) Arctic Ocean

Q8. How many research stations has India established in Antarctica?
(a) One
(b) Two
(c) Three
(d) Four

Q9. What are tiny marine plants called?
(a) Seaweed
(b) Algae
(c) Plankton
(d) Coral

Q10. Which two continents together form the landmass sometimes called Eurasia?
(a) Africa and Asia
(b) Europe and Africa
(c) Europe and Asia
(d) Asia and Australia

SECTION B - Short Answer Questions (2 marks each)

Q11. Define the terms 'flora' and 'fauna' with examples from marine life.

Q12. Why are oceans and continents not equally distributed between hemispheres?

Q13. What is the significance of June 8th as declared by the United Nations?

Q14. How do clouds bring rain to continents? Explain briefly.

SECTION C - Short Answer Questions (3 marks each)

Q15. Why is there a water crisis despite Earth having abundant water? Explain the concept of water scarcity.

Q16. What are the conventional boundaries shown on ocean maps? Are oceans truly separate water

bodies?

Q17. Describe India's contribution to Antarctic research. Include information about research stations and scientific work.

SECTION D - Long Answer Question (5 marks)

Q18. Discuss natural disasters related to oceans. Include tsunamis and cyclones, their causes, effects, and measures taken to protect people from them.

SECTION E - Case Study Based Questions (4 marks each)

Q19. Read the case study and answer the questions that follow:

Ocean pollution has become one of the most serious environmental challenges of our time. Every year, humans dump approximately 8 million tonnes of plastic waste into the oceans. This plastic breaks down into smaller pieces called microplastics but never fully disappears. Marine animals often mistake plastic for food, leading to injury or death. Sea turtles eat plastic bags thinking they are jellyfish. Seabirds feed plastic pieces to their chicks. Fish consume microplastics, which then enter the human food chain when we eat seafood. Beyond plastic, oceans face pollution from oil spills, industrial waste, agricultural runoff containing pesticides and fertilizers, and sewage. Some areas of the ocean have become "dead zones" where marine life cannot survive due to oxygen depletion caused by pollution. Scientists warn that if current trends continue, there could be more plastic than fish in the oceans by weight within a few decades.

(i) How much plastic waste enters oceans annually? (1 mark)

(ii) What are microplastics? (1 mark)

(iii) How does ocean plastic pollution affect marine animals? Give one example. (1 mark)

(iv) Why are "dead zones" formed in some ocean areas? (1 mark)

Q20. Read the case study and answer the questions that follow:

The diversity of ocean life is truly remarkable. Coral reefs, often called the "rainforests of the sea," support about 25% of all marine species despite covering less than 1% of the ocean floor. These colorful underwater structures are actually colonies of tiny animals called coral polyps. Coral reefs provide habitat, food, and protection for thousands of fish species and other marine creatures. The deep ocean, below 1,000 meters, remains largely unexplored - humans have explored less than 5% of the ocean floor. This mysterious region contains unique life forms that have adapted to extreme conditions of high pressure, complete darkness, and near-freezing temperatures. Some deep-sea creatures produce their own light through bioluminescence. Scientists estimate that millions of marine species are yet to be discovered. Ocean biodiversity is crucial not just for marine ecosystems but also for human survival, as oceans regulate climate, produce oxygen, and provide food for billions of people.

(i) Why are coral reefs called "rainforests of the sea"? (1 mark)

(ii) What percentage of the ocean floor have humans explored? (1 mark)

(iii) What is bioluminescence? (1 mark)

(iv) Why is ocean biodiversity important for humans? (1 mark)

DETAILED ANSWER KEY - PAPER 04

SECTION A - Answers to MCQs

Answer 1: (d) All of the above

All oceans on Earth are interconnected and can be referred to as the global ocean, world ocean, or interconnected ocean system. Water constantly flows between all five oceans.

Answer 2: (c) Arctic Ocean

The Arctic Ocean is located around the North Pole and is the smallest of all five oceans. It is mostly covered with ice throughout the year.

Answer 3: (b) Arabian Sea

Lakshadweep Islands are located in the Arabian Sea, to the west of India. The Andaman and Nicobar Islands are in the Bay of Bengal to the east of India.

Answer 4: (b) The blue planet

Early astronauts lovingly called Earth the 'blue planet' because when viewed from space, the abundant water covering most of Earth's surface makes it appear predominantly blue.

Answer 5: (d) Antarctica

Antarctica lies entirely in the Southern Hemisphere, surrounding the South Pole. Australia is also mainly in the Southern Hemisphere, while South America and Africa straddle both hemispheres.

Answer 6: (c) More than half

Oceans produce more than half of the world's oxygen through photosynthesis by marine plants (algae and seaweeds). This is why oceans are called 'the planet's lungs'.

Answer 7: (b) Atlantic Ocean

The Atlantic Ocean separates Europe and Africa from the Americas (North and South America). It is the second largest ocean.

Answer 8: (c) Three

India has established three research stations in Antarctica: Dakshin Gangotri (1983), Maitri (1989), and Bharati (2012).

Answer 9: (b) Algae

Tiny marine plants are called algae. They are part of marine flora and play a crucial role in producing oxygen through photosynthesis.

Answer 10: (c) Europe and Asia

Europe and Asia together form a single continuous landmass called Eurasia. They are separated more by cultural and historical reasons than by clear geographical boundaries.

SECTION B - Answers to Short Answer Questions

Answer 11:

Flora: The term 'flora' refers to the plant life of a particular region or period of time.

Marine Flora Examples:

• Algae (tiny marine plants)

• Seaweed (various types of marine plants)

Fauna: The term 'fauna' refers to the animal life of a particular region or period of time.

Marine Fauna Examples:

• Fish (thousands of species of colorful fish)

• Dolphins (intelligent marine mammals)

Answer 12:

Oceans and continents are not equally distributed between the Northern and Southern Hemispheres due to the geological formation and arrangement of Earth's landmasses.

• The Northern Hemisphere has more landmass, containing most of the world's continents (all of Europe, most of Asia, North America, and parts of Africa and South America)

• The Southern Hemisphere has significantly more water coverage and is dominated by oceans (Pacific, Atlantic, Indian, and Southern Oceans), with less land (Antarctica, Australia, and parts of South America and Africa)

This unequal distribution affects climate patterns, ocean currents, and seasonal variations between the two hemispheres.

Answer 13:

June 8th has been designated by the United Nations as World Oceans Day. The significance of this day is to:

• Remind humanity of the major role oceans play in everyday life

• Highlight that oceans serve as the lungs of our planet, producing most of the oxygen we breathe

• Emphasize that oceans are a major source of food and medicine

• Raise awareness about ocean conservation and the need to protect oceans from pollution and overfishing

• Encourage people worldwide to take action for ocean protection

Answer 14:

The process by which clouds bring rain to continents is part of the water cycle:

1. The sun's heat causes water to evaporate from ocean surfaces, forming water vapor

2. This water vapor rises into the atmosphere and cools down, condensing to form clouds

3. Wind carries these clouds from the oceans over the continents

4. When clouds become heavy with water droplets, they release precipitation as rain (or snow in cold regions)

For example, India's monsoon rains originate from evaporation over the Indian Ocean and Arabian Sea.

SECTION C - Answers to Short Answer Questions

Answer 15:

Despite Earth having abundant water, there is a water crisis due to the nature and distribution of this water:

Reasons for Water Scarcity:

1. Most water is seawater: About 97% of Earth's water is salty seawater in the oceans, which is unfit for consumption by most land animals, including humans. Drinking seawater can actually dehydrate the body.

2. Limited freshwater: Only about 3% of Earth's water is freshwater, and most of this is locked in glaciers and ice caps, making it inaccessible.

3. Uneven distribution: Available freshwater is not evenly distributed. Some regions have abundant water while others face severe shortages.

4. Pollution: Much of the available freshwater is polluted by human activities, making it unsafe for use.

5. Growing demand: Increasing population, agriculture, and industry are putting pressure on limited freshwater resources.

6. Groundwater depletion: Overuse is depleting underground water sources faster than they can be replenished.

Therefore, while Earth has abundant water overall, the scarcity of usable freshwater creates a water crisis in many parts of the world.

Answer 16:

The conventional boundaries shown on ocean maps divide the global ocean into five named oceans: Pacific, Atlantic, Indian, Arctic, and Southern.

Nature of these boundaries:

• These lines are conventions or agreements for geographical reference and are not actual physical separations
• The natural world does not follow such boundaries
• In reality, all oceans are interconnected and form one continuous body of water

Evidence of interconnection:

• Seawater constantly flows across different oceans through ocean currents
• Marine species can be found across multiple oceans as there are no barriers preventing their movement
• Water, nutrients, and heat are exchanged freely between all ocean regions
• Many marine species migrate between different named ocean regions

Therefore, while we name five separate oceans for convenience, they are actually parts of one interconnected global ocean system that covers most of Earth's surface.

Answer 17:

India has made significant contributions to Antarctic research through the Indian Antarctica Programme:

Timeline and Research Stations:

• The program began in 1981
• First research station: Dakshin Gangotri, established in 1983
• Second research station: Maitri, established in 1989
• Third research station: Bharati, established in 2012

Scientific Research:

• About 40 teams of Indian scientists have conducted research expeditions to Antarctica
• Primary research areas include:
- Evolution of climate and environment
- Atmospheric science
- Glaciology (study of ice and glaciers)
- Impact of Antarctica on global climate patterns

Facilities:

• Research stations have comprehensive facilities including:
- Scientific laboratories for conducting experiments
- Living quarters for scientists
- A library for research materials
- Even a post office

India's Antarctic research contributes to global understanding of climate change and environmental processes, demonstrating India's commitment to scientific exploration and international cooperation in polar research.

SECTION D - Answer to Long Answer Question

Answer 18:

Oceans can give rise to several types of natural disasters that cause significant damage to coastal regions:

1. TSUNAMIS:

Causes:
• Powerful underwater earthquakes that displace large volumes of water
• Volcanic eruptions on the ocean floor
• Underwater landslides

Characteristics:

• Huge and powerful waves that can travel thousands of kilometers

• In deep ocean, travel very fast (up to 800 km/h) but are relatively low in height

• When approaching shallow coastal waters, slow down but grow dramatically in height (30 meters or more)

Effects:

• Can submerge entire coastal areas

• Cause widespread damage to buildings and infrastructure

• Result in massive loss of life

• Example: The 2004 Indian Ocean tsunami affected 14 countries and killed more than two lakh people. In India, Andaman and Nicobar Islands and coastal areas of Tamil Nadu and Kerala were severely affected.

2. CYCLONES:

Causes:

• Form over warm ocean waters when atmospheric conditions are favorable

• Powered by heat energy from warm ocean surface

Characteristics:

• Violent storms with extreme rainfall

• Very strong winds that can exceed 200 km/h

• Can cause storm surges (abnormal rise in sea level)

Effects:

• Widespread damage to coastal regions

• Flooding due to heavy rainfall and storm surge

• Destruction of homes, crops, and infrastructure

• Loss of life

PROTECTIVE MEASURES:

1. **Early Warning Systems:**

• Indian Ocean Tsunami Warning System for tsunami detection

• Meteorological satellites and ocean buoys for cyclone tracking

• These systems detect disasters before they hit, allowing time for evacuation

2. **Disaster Management:**

• India has National Disaster Management Authority (NDMA)

• Coordinates preparedness, response, and recovery efforts

• Conducts drills and awareness programs

3. **Infrastructure:**

• Building cyclone shelters in coastal areas

• Coastal embankments and sea walls

• Mangrove forests act as natural barriers

4. **Community Preparedness:**
• Public education about disaster risks
• Evacuation plans and routes
• Emergency supplies and communication systems

5. **International Cooperation:**
• Many countries collaborate in early warning systems
• Sharing of data and technology
• Coordinated response efforts

Conclusion: While ocean-related disasters cannot be prevented, early warning systems and proper disaster management can significantly reduce loss of life and property. It is crucial to maintain and improve these protective measures for coastal communities worldwide.

SECTION E - Answers to Case Study Based Questions

Answer 19:

(i) How much plastic waste enters oceans annually?
Approximately 8 million tonnes (or several million tonnes) of plastic waste is dumped into the oceans every year by humans.

(ii) What are microplastics?
Microplastics are smaller pieces formed when plastic waste breaks down in the ocean. However, plastic never fully disappears and these tiny pieces persist in the marine environment.

(iii) How does ocean plastic pollution affect marine animals? Give one example.
Ocean plastic pollution harms marine animals in several ways. One example is that sea turtles eat plastic bags thinking they are jellyfish, which can lead to injury or death. Another example is that seabirds feed plastic pieces to their chicks, or fish consume microplastics which then enter the human food chain.

(iv) Why are "dead zones" formed in some ocean areas?
"Dead zones" are formed due to oxygen depletion caused by pollution. In these areas, pollution (from sources like industrial waste, agricultural runoff, and sewage) creates conditions where marine life cannot survive due to lack of oxygen.

Answer 20:

(i) Why are coral reefs called "rainforests of the sea"?
Coral reefs are called "rainforests of the sea" because they support about 25% of all marine species despite covering less than 1% of the ocean floor, similar to how tropical rainforests support exceptional biodiversity on land.

(ii) What percentage of the ocean floor have humans explored?
Humans have explored less than 5% of the ocean floor. The deep ocean remains largely unexplored and mysterious.

(iii) What is bioluminescence?

Bioluminescence is the ability of some deep-sea creatures to produce their own light. These organisms have adapted to the complete darkness of the deep ocean by developing the capability to create light through biological processes.

(iv) Why is ocean biodiversity important for humans?
Ocean biodiversity is important for humans because: (1) Oceans regulate climate, affecting weather patterns globally; (2) Oceans produce oxygen that we breathe; (3) Oceans provide food (fish and seafood) for billions of people. The case study emphasizes that ocean biodiversity is crucial not just for marine ecosystems but also for human survival.
