

Our Environment

Ecosystem and Its Components (Questions 1-5)

1. What is an ecosystem? Explain the biotic and abiotic components of an ecosystem with examples.
2. Define the following terms: producers, primary consumers, secondary consumers, and decomposers. Give examples of each.
3. Construct a food chain with four trophic levels. Explain why food chains generally do not have more than four or five trophic levels.
4. What is a food web? How does it differ from a food chain? Why are food webs more stable than food chains?
5. Explain the flow of energy in an ecosystem. Why is energy flow unidirectional while matter flow is cyclic?

Trophic Levels and Energy Flow (Questions 6-10)

6. What are trophic levels? Draw a pyramid of energy and explain why it is always upright.
7. State the 10% law of energy transfer. If 10,000 J of energy is available at the producer level, how much energy will be available at the third trophic level?
8. Why are there more herbivores than carnivores in any ecosystem? Explain with reasons.
9. What would happen to an ecosystem if all decomposers were removed? Explain the importance of decomposers.
10. Compare the pyramid of numbers in a grassland ecosystem and a forest ecosystem. Why can the pyramid of numbers be inverted?

Biogeochemical Cycles (Questions 11-13)

11. What are biogeochemical cycles? Explain the carbon cycle with a labeled diagram.
12. Describe the nitrogen cycle. Why is nitrogen fixation important for plants?
13. How do human activities affect the carbon cycle? What are the consequences of increased carbon dioxide in the atmosphere?

Environmental Problems (Questions 14-17)

14. What is ozone depletion? What are the causes and effects of ozone layer depletion? How can it be prevented?

15. Explain the greenhouse effect. How does it lead to global warming? List the consequences of global warming.
16. What is biodegradable and non-biodegradable waste? Give examples of each. Why are non-biodegradable materials harmful to the environment?
17. What are the causes and effects of water pollution? Suggest measures to control water pollution.

Waste Management and Conservation (Questions 18-20)

18. Explain the concept of 3Rs (Reduce, Reuse, Recycle) in waste management. Give examples of how each can be practiced in daily life.
19. Why is it important to manage our garbage properly? What problems arise from improper waste disposal?
20. What steps can be taken to conserve our environment? How can individuals contribute to environmental protection?

Additional Application-Based Questions:

Higher Order Questions:

- A lake ecosystem has the following organisms: fish, water plants, small aquatic animals, bacteria. Arrange them in a food chain and explain what happens if fish are removed from the ecosystem.
- Why do we not find lions in forests where tigers live naturally? Explain in terms of ecological niches.
- How does deforestation affect the carbon and oxygen cycles? Explain the environmental consequences.
- What is biological magnification? Explain with the example of DDT accumulation in a food chain.

Analytical Questions:

- A farmer uses excessive fertilizers in his field. How can this affect the nearby water body? Explain the process of eutrophication.
- Why is plastic pollution a major environmental concern? What alternatives can be used to reduce plastic waste?
- How does burning of fossil fuels contribute to acid rain? What are the effects of acid rain on the environment?
- Explain why natural ecosystems are more stable than artificial ecosystems.

Practical Application Questions:

- Design a simple experiment to show that plants release oxygen during photosynthesis.
- How can kitchen waste be converted into useful compost? Explain the role of decomposers in this process.
- What measures should be taken to reduce air pollution in cities? How can individuals contribute?
- Explain how rainwater harvesting helps in water conservation and groundwater recharge.

Case Study Questions:

- A forest area has been cleared for agriculture. Predict the changes that will occur in the local ecosystem.
- The number of sparrows in urban areas has decreased drastically. What could be the possible reasons and solutions?
- How has the ban on plastic bags helped in environmental conservation? What other measures are needed?
- Explain how climate change affects different ecosystems around the world.