

Chapter – 6

The Living Organisms and Their Surroundings

2marks:

1. What is a habitat?

Answer:

The place where organisms live is called the habitat. Habitat means a dwelling place (a home). The habitat provides food, water, air, shelter and other needs to organisms.

2. How is a cactus adapted to survive in a desert?

Answer:

Adaptations of a cactus are as follows:

- The leaf is replaced by the spine to reduce transpiration
- Stems carry out photosynthesis
- A thick waxy layer surrounds the leaf to retain water
- The roots of a cactus are deeply rooted inside the soil to absorb water

3.Differentiate between a biotic and an abiotic component of an ecosystem.

Answer:

Biotic components are living things in an ecosystem, such as plants and animals, while abiotic components are non-living things like sunlight, soil, air, and water.

4.How do organisms adapt to their surroundings?

Answer:

Organisms adapt to their surroundings through physical features, behaviours, or physiological changes that help them survive and reproduce in their specific habitat.

5.Define decomposers and provide an example.

Answer:

Decomposers are organisms that break down dead plants and animals into simpler substances. Example: Bacteria and fungi.

6.Explain the importance of conservation of natural resources for living organisms.

Answer:

Conservation of natural resources is crucial for maintaining a balanced ecosystem. It ensures a sustainable environment by preserving habitats, biodiversity, and the overall well-being of living organisms.

7.Describe the role of the Sun in the food chain.

Answer:

The Sun is the primary source of energy in a food chain. It provides sunlight for plants to undergo photosynthesis, and these plants, in turn, serve as the base of the food chain, transferring energy to herbivores, then to carnivores, and so on.

5marks:

1.Explain the interdependence of living organisms in an ecosystem. Provide examples to illustrate how different species rely on each other for survival and sustenance.

Answer:

In an ecosystem, various species are interdependent for food, shelter, and other resources. For instance, pollinators like bees rely on flowering plants for nectar, while the plants depend on the pollinators for reproduction. Similarly, predators and prey maintain a delicate balance, and disruptions in one species can affect the entire ecosystem.

2.Discuss the impact of climate change on the migration patterns of birds. Include information on how altered temperature and habitat conditions influence the behaviour and survival of migratory bird species.

Answer:

Climate change has significant effects on bird migration. Rising temperatures can alter the timing of migration, affecting breeding and feeding patterns. Changes in habitat conditions, such as loss of wetlands, can disrupt traditional migratory routes. Some species may face challenges in finding suitable nesting sites or adequate food sources, leading to population declines.

3.Elaborate on the role of keystone species in maintaining biodiversity. Provide examples and explain how the loss of a keystone species can impact the structure and function of an ecosystem.

Answer:

Keystone species play a crucial role in maintaining the balance of an ecosystem. For example, sea otters in kelp forests control sea urchin populations, preventing overgrazing of kelp. If a keystone species is lost, it can lead to a domino effect, affecting the abundance of other species and potentially causing cascading disruptions throughout the ecosystem.

4.Compare and contrast the adaptations of a cactus and a mangrove plant to their respective environments. Include information on their structural, physiological, and behavioural adaptations.

Answer:

Cacti, adapted to arid environments, have features like water-storing stems and reduced leaves to minimize water loss. Mangrove plants in coastal areas have roots that can tolerate saltwater and assist in oxygen intake. The structural, physiological, and behavioural adaptations of these plants showcase their resilience in distinct environmental conditions.

5.Evaluate the impact of deforestation on the water cycle. Include information on how trees contribute to rainfall patterns, regulate water flow, and prevent soil erosion.

Answer:

Deforestation disrupts the water cycle by reducing transpiration and evaporation from trees. Trees play a vital role in maintaining local rainfall patterns, and their removal can lead to decreased precipitation. Additionally, the absence of tree roots can result in increased soil erosion and altered water flow, negatively affecting aquatic ecosystems downstream.

6.Analyze the concept of ecological succession. Provide examples of primary and secondary succession and explain the role of pioneer species in the colonization of barren habitats.

Answer:

Ecological succession is the process of gradual, sequential changes in a community over time. Primary succession occurs on bare, lifeless substrates (e.g., volcanic rock), while secondary succession follows disturbances like forest fires. Pioneer species, such as lichens and mosses, play a crucial role in soil formation and create conditions for more complex plant species to establish.

7.Discuss the importance of wetlands in maintaining ecological balance. Include information on the functions of wetlands, such as

water filtration, flood control, and habitat provision for diverse species.

Answer:

Wetlands are critical for ecological balance as they serve as natural filters, trapping pollutants and improving water quality. They play a key role in flood control by absorbing excess water during heavy rainfall. Additionally, wetlands provide habitats for a wide variety of species, contributing to overall biodiversity and supporting numerous ecological processes.

8.Explore the concept of bioaccumulation and its implications for food chains. Provide examples of pollutants that tend to bioaccumulate, explain how they enter food chains, and discuss potential consequences for higher trophic levels.

Answer:

Bioaccumulation is the gradual buildup of pollutants in organisms over time. Persistent organic pollutants (POPs) like certain pesticides and heavy metals tend to bioaccumulate. These substances enter food chains through various pathways, and as they move up the trophic levels, their concentrations increase. This can lead to health issues for predators at the top of the food chain, including humans, as they are exposed to higher levels of pollutants.

3. Fill in the blanks

- (a) The presence of specific features, which enable a plant or an animal to live in a particular habitat, is called _____.
- (b) The habitats of the plants and animals that live on land are called _____ habitat.
- (c) The habitats of plants and animals that live in water are called _____habitats.
- (d) Soil, water and air are the _____ factors of a habitat.
- (e) Changes in our surroundings that make us respond to them are called _____.

Solution:

- (a) The presence of specific features, which enable a plant or an animal to live in a particular habitat, is called **adaptation**.
- (b) The habitats of the plants and animals that live on land are called **terrestrial** habitats.
- (c) The habitats of plants and animals that live in water are called **aquatic** habitats.
- (d) Soil, water and air are the **abiotic** factors of a habitat.
- (e) Changes in our surroundings that make us respond to them are called **stimuli**.

4. Which of the things in the following list are nonliving?

Plough, mushroom, sewing machine, radio, boat, water hyacinth, earthworm

Solution:

Plough, sewing machine, radio and boat are non living things

5. Give an example of a non living thing which shows any two characteristics of living things.

Answer:

Example: car

Features:

- It can move like living beings
- It needs energy to do work

6. Which of the non living things listed below were once part of a living thing?

Butter, Leather, soil, wool, electric bulb, cooking oil, salt, apple, rubber

Answer:

Butter, Leather, wool, cooking oil, apple and rubber were once part of a living thing

7. List the common characteristics of living things.

Answer:

Common characteristics of living things are as follows:

- i) Respiration
- ii) Food intake
- iii) Respond to stimuli
- iv) Excretion
- v) Movement

vi) Reproduction

vii) Grow and die

8. Explain why speed is important for survival in the grasslands for animals that live there. (Hint: There are few trees or places for animals to hide in grassland habitats.)

Answer:

Speed is important for survival in the grasslands for animals to avoid predation from their predators. For example, a tiger eats deer; to survive, the deer has to run faster than the tiger.

Multiple choice:

1.What is the primary source of energy for almost all ecosystems on Earth?

A) Wind

B) Soil

C) Sunlight

D) Fossil fuels

Answer:

C) Sunlight

2.Which of the following is a biotic component of an ecosystem?

A) Soil

B) Sunlight

C) Water

D) Trees

Answer:

D) Trees

3.What is the process by which green plants manufacture their food using sunlight?

A) Respiration

B) Digestion

C) Photosynthesis

D) Transpiration

Answer:

C) Photosynthesis

4.Which of the following is an example of an abiotic factor in an ecosystem?

A) Rabbit

B) River

C) Eagle

D) Oak tree

Answer:

B) River

5.What term is used to describe the role of an organism in an ecosystem, including its relationships with other organisms and the environment?

- A) Habitat**
- B) Niche**
- C) Ecosystem**
- D) Community**

Answer:

- B) Niche**

6.What is the role of decomposers in an ecosystem?

- A) Convert sunlight into energy**
- B) Break down dead organic matter**
- C) Predatory activities**
- D) Photosynthesis**

Answer:

- B) Break down dead organic matter**

7.Which biome is characterized by low temperatures, permafrost, and a short growing season?

- A) Tropical rainforest**
- B) Tundra**
- C) Desert**

D) Grassland

Answer:

B) Tundra

8.What is the process by which an organism gradually adjusts to its environment over time?

A) Adaptation

B) Evolution

C) Speciation

D) Mutation

Answer:

A) Adaptation

9.What is the primary function of wetlands in an ecosystem?

A) Absorb excess sunlight

B) Control air pollution

C) Provide habitat for diverse species

D) Generate electricity

Answer:

C) Provide habitat for diverse species

10.Which human activity is a major contributor to deforestation?

- A) Recycling**
- B) Afforestation**
- C) Logging**
- D) Wildlife conservation**

Answer:

C) Logging

Summary:

In ecosystems, sunlight stands out as the primary source of energy, fueling the intricate web of life. Biotic components, such as trees, contribute to the ecosystem's vitality, illustrating the dynamic interplay between living organisms. Green plants harness sunlight through photosynthesis, a pivotal process where they convert light energy into sustenance, fundamentally shaping the foundation of food chains. Abiotic factors, like rivers, complement the biological aspects, further defining the intricate balance within an ecosystem.

An organism's role, known as its niche, encapsulates its interactions and contributions to the ecosystem. Decomposers, vital in this ecological tapestry, diligently break down deceased organic matter, facilitating nutrient recycling. The tundra biome, with its permafrost and abbreviated growing season, showcases the diverse environmental conditions that shape ecosystems.

Adaptation, a gradual adjustment to the environment, underscores the resilience of organisms over time. Wetlands emerge as critical players, providing a haven for diverse species and contributing significantly to overall biodiversity.