8. DIFFERENT ECOSYSTEMS

TEACHING TASK (Page 3 – 6)

NEET LEVEL QUESTIONS

Multiple Choice Questions

1) Overpopulation of predators can lead to:

Answer: B) Decreased prey population

Explanation: Overpopulation of predators increases predation pressure, leading to a decline in prey populations due to excessive hunting or consumption. This can disrupt the balance of the ecosystem.

2) What effect do natural disasters have on ecosystems?

Answer: C) They cause immediate and dramatic changes

Explanation: Natural disasters like floods, hurricanes, or wildfires cause rapid and significant alterations in ecosystems, such as habitat destruction, species loss, or changes in resource availability.

3) How do humans impact ecosystems?

Answer: C) By causing changes, sometimes harmful, to the environment

Explanation: Human activities like deforestation, pollution, and urbanization often lead to habitat destruction, pollution, and loss of biodiversity, which can harm ecosystems.

4) What is the largest ecosystem on Earth called?

Answer: B) Biosphere

Explanation: The biosphere encompasses all ecosystems on Earth, including terrestrial, aquatic, and atmospheric environments where life exists.

5) Ecologists divide the biosphere into different ecosystems based on:

Answer: D) Various factors

Explanation: Ecosystems are classified based on a combination of abiotic (climate, soil, water) and biotic (plants, animals, microorganisms) factors that define their characteristics.

6) Which factors lead to the formation of unique ecosystems?

Answer: C) Both abiotic and biotic factors

Explanation: Unique ecosystems arise from the interaction of abiotic factors (e.g., temperature, water availability) and biotic factors (e.g., species composition and interactions).

7) What is the definition of an ecosystem?

Answer: C) A functional unit where organisms interact with their environment

Explanation: An ecosystem is a dynamic system where living organisms (biotic) interact with each other and their non-living environment (abiotic) to form a functional unit.

8) Which of the following is not an example of an ecosystem?

Answer: C) Single plant

Explanation: A single plant does not constitute an ecosystem, as an ecosystem involves interactions among multiple organisms and their environment. Forests, grasslands, and other examples involve such interactions.

9) Which of the following is not a type of ecosystem?

Answer: D) Oceanic

Explanation: Oceanic is not a distinct ecosystem type; it is part of the broader aquatic ecosystem category, which includes marine and freshwater ecosystems.

10) What defines an ecosystem as natural or artificial?

Answer: B) Presence of humans

Explanation: Artificial ecosystems, like aquariums or urban parks, are created or heavily influenced by human activities, whereas natural ecosystems, like forests or deserts, exist without significant human intervention.

NEET ADVANCED LEVEL QUESTIONS

More than One Answer Type

11) Which feeding levels are described in a food chain?

Answer: A) Producers, B) Decomposers, C) Herbivores, D) Omnivores

Explanation: A food chain includes producers (plants that produce energy via photosynthesis), herbivores (primary consumers that eat plants), omnivores (consume both plants and animals), and decomposers (break down dead organic matter).

12) Which factors can influence the formation of different ecosystems?

Answer: A) Abiotic factors, B) Biotic factors, C) Climatic conditions, D) Human activities

Explanation: Ecosystems are shaped by abiotic factors (e.g., temperature, water), biotic factors (e.g., species interactions), climatic conditions (e.g., rainfall, sunlight), and human activities (e.g., deforestation, urbanization).

13) Which human activities can impact ecosystems negatively?

Answer: A) Deforestation, C) Pollution

Explanation: Deforestation destroys habitats, and pollution degrades environmental quality, both negatively impacting ecosystems. Recycling and conservation efforts have positive or neutral effects.

Assertion and Reason Type

14) Reasoning: What causes the formation of different types of ecosystems?

Assertion: The unique combination of abiotic and biotic factors determines the formation of diverse ecosystems.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: The assertion is true because ecosystems are defined by the interplay of abiotic (e.g., climate, soil) and biotic (e.g., plants, animals) factors. The reason explains why diverse ecosystems form due to these unique combinations.

Reasoning: Why do organisms affect their environments?

15) Assertion: Organisms alter their environments to fulfill their survival needs, often leading to changes in the ecosystem.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Organisms modify their environments (e.g., beavers building dams, plants altering soil chemistry) to meet survival needs, which can lead to ecosystem changes. The reason directly explains the assertion.

Reasoning: How do natural disasters influence ecosystems?

16) Assertion: Natural disasters can swiftly alter ecosystems, causing significant disruptions to the balance of organisms and their environments.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Natural disasters (e.g., floods, fires) cause rapid changes, such as habitat loss or species displacement, disrupting ecosystem balance. The reason explains how disasters lead to these disruptions.

Matrix Matching Type

17) Match the ecosystem example with its characteristic feature.

Answer:

Forest Patch → C. Contains a variety of terrestrial plants and animals with a small area of water nearby.

Edge of a Pond → B. Contains a mix of aquatic and terrestrial species, often with a diverse range of plants and fish.

Manned Spaceship → A. Isolated environment with controlled conditions for human habitation in space.

Aquarium → D. Simulates a natural aquatic environment and houses fish, plants, and other aquatic organisms.

Explanation: Each ecosystem is matched based on its defining characteristics. For example, a forest patch includes diverse terrestrial species, while an aquarium mimics an aquatic environment.

Comprehension Type

18) Questions based on decomposers:

i. What is the primary function of decomposers in an ecosystem?

Answer: B) To break down organic matter and return nutrients to the soil

Explanation: Decomposers, like fungi and bacteria, break down dead organic matter, recycling nutrients like carbon and nitrogen back into the soil for use by plants.

ii. Why are decomposers essential for the nutrient cycle?

Answer: B) They transform organic matter into simpler substances that plants can absorb.

Explanation: Decomposers convert complex organic matter into simpler compounds (e.g., nitrates, phosphates), which plants can absorb, thus sustaining the nutrient cycle.

iii. What would likely happen to an ecosystem if decomposers were absent?

Answer: B) Nutrients would accumulate in organic matter, leading to nutrient depletion in the soil.

Explanation: Without decomposers, dead organic matter would pile up, locking nutrients away and depleting the soil, which would hinder plant growth and disrupt the ecosystem.

LEARNERS TASK (Page 6 – 8)

NEET LEVEL QUESTIONS

Multiple Choice Questions

1) What are the living components of an ecosystem called?

Answer: C) Biotic components

Explanation: Biotic components include all living organisms in an ecosystem, such as plants, animals, and microorganisms, as opposed to abiotic (non-living) factors.

2) Which of the following is not considered an abiotic component of an ecosystem?

Answer: D) Bacteria

Explanation: Bacteria are living organisms and thus biotic components. Abiotic components include non-living factors like sunlight, soil, and air.

3) Energy flow in an ecosystem primarily originates from:

Answer: C) Sunlight

Explanation: Sunlight is the primary energy source for ecosystems, captured by producers (plants) through photosynthesis to drive energy flow.

4) What is the role of decomposers in an ecosystem?

Answer: B) They break down organic matter and recycle nutrients.

Explanation: Decomposers, such as fungi and bacteria, decompose dead matter, recycling nutrients back into the ecosystem for use by other organisms.

5) Which level of the food chain includes animals that eat plants?

Answer: B) Herbivores

Explanation: Herbivores, or primary consumers, feed directly on plants (producers) in the food chain.

6) What defines the edge of an ecosystem?

Answer: C) Transition zone between different ecosystems

Explanation: The edge of an ecosystem, or ecotone, is the transitional area where two ecosystems meet, often showing characteristics of both.

7) Which of the following is not a characteristic of an ecosystem?

Answer: C) Human population density

Explanation: Human population density is not a defining feature of ecosystems, which are characterized by energy flow, biodiversity, and interactions between living and non-living components.

8) What differentiates a temporary ecosystem from a permanent one?

Answer: C) Duration of existence

Explanation: Temporary ecosystems, like a seasonal pond, exist for a limited time, while permanent ecosystems, like forests, persist over long periods.

9) What is the primary source of energy for all living things in an ecosystem?

Answer: C) Sunlight

Explanation: Sunlight drives photosynthesis in producers, providing the energy that sustains all life in an ecosystem.

10) Which of the following is not a feeding level in a food chain?

Answer: D) Decomposers

Explanation: Decomposers break down dead matter but are not considered a feeding level in the food chain, which typically includes producers, herbivores, and carnivores/omnivores.

NEET ADVANCED LEVEL QUESTIONS

More than One Answer Type

11) Which of the following are considered biotic components of an ecosystem?

Answer: A) Plants, B) Animals, C) Microorganisms

Explanation: Biotic components are living organisms, including plants, animals, and microorganisms. Sunlight is an abiotic factor.

12) Which interactions occur within an ecosystem besides feeding relationships?

Answer: A) Reproduction, B) Shelter, C) Communication, D) Competition

Explanation: Ecosystems involve various interactions, such as reproduction (mating), shelter (organisms using habitats), communication (e.g., signaling), and competition (for resources).

13) Which organisms derive energy directly from the sun in an ecosystem?

Answer: A) Plants

Explanation: Plants (producers) capture solar energy through photosynthesis. Herbivores, carnivores, and decomposers rely indirectly on this energy.

Assertion and Reason Type

14) Reasoning: Why are decomposers essential components of an ecosystem?

Assertion: Decomposers play a crucial role in recycling nutrients within an ecosystem.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Decomposers recycle nutrients by breaking down dead matter, making them essential for ecosystem sustainability. The reason explains the assertion.

15) Reasoning: What is the significance of studying ecosystems?

Assertion: Understanding ecosystems helps in comprehending the intricate relationships between living organisms and their environments.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Studying ecosystems reveals how organisms interact with each other and their environment, which is critical for conservation and management. The reason supports the assertion.

16) Reasoning: How do human activities impact ecosystems?

Assertion: Human activities can disrupt the balance of ecosystems, leading to detrimental consequences for both flora and fauna.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Human activities like deforestation and pollution disrupt ecosystem balance, harming plants and animals. The reason explains the assertion.

Matrix Matching Type

17) Match the ecosystem type with its description.

Answer: Grassland → C. This ecosystem is dominated by grasses and is home to grazing mammals and predators like lions and cheetahs.

Rainforest → A. This ecosystem is characterized by high biodiversity and dense vegetation, with abundant rainfall and warm temperatures.

Desert → B. This ecosystem is known for its sparse vegetation, high temperatures during the day, and low temperatures at night.

Coral Reef → D. This ecosystem is formed by colonies of coral polyps and supports a wide variety of marine life.

Explanation: Each ecosystem is matched with its unique characteristics, such as grasslands supporting grazing animals or rainforests having high biodiversity.

Comprehension Type

18) Questions based on ecosystems:

i. What is the smallest scale at which an ecosystem can exist?

Answer: B) A single plant

Explanation: A micro-ecosystem, such as a single plant interacting with soil and microorganisms, represents the smallest scale of an ecosystem.

ii. What distinguishes the biosphere from other ecosystems?

Answer: D) Its vastness, encompassing the entirety of Earth's surface

Explanation: The biosphere is unique as it includes all ecosystems on Earth, covering terrestrial, aquatic, and atmospheric environments.

iii. How do ecosystems contribute to the functioning of the biosphere?

Answer: B) By influencing the climate and geography of the planet

Explanation: Ecosystems shape the biosphere by influencing climate (e.g., forests regulating CO_2) and geography (e.g., coral reefs shaping coastlines).

TEACHING TASK (Page 11 - 14)

NEET LEVEL QUESTIONS

Multiple Choice Questions

1) How do mangroves obtain mineral nutrients?

Answer: C) From fresh and salt water

Explanation: Mangroves grow in coastal areas where they absorb mineral nutrients from both freshwater (rivers) and saltwater (tides).

2) What is the primary source of energy for photosynthesis?

Answer: C) Sunlight

Explanation: Photosynthesis in plants relies on sunlight to convert carbon dioxide and water into glucose, providing energy for growth.

3) Which ecosystem covers about 17% of the Earth's land?

Answer: B) Forest

Explanation: Forests cover approximately 17% of Earth's land surface, providing critical habitats and supporting biodiversity.

4) Which organisms are classified as producers in a forest ecosystem?

Answer: C) Trees

Explanation: Trees, as photosynthetic plants, are the primary producers in forest ecosystems, generating energy for the food chain.

5) What is the primary function of shrubs in a desert ecosystem?

Answer: B) To store water in their stems

Explanation: Desert shrubs often have adaptations like water-storing stems to survive arid conditions, unlike providing shade or breaking down matter.

6) Which organisms are considered consumers in a mangrove ecosystem?

Answer: C) Shrimp and crabs

Explanation: Shrimp and crabs are consumers, feeding on organic matter or other organisms, unlike trees (producers) or bacteria (decomposers).

7) What percentage of light energy reaches plants for photosynthesis?

Answer: D) 2%

Explanation: Only about 2% of sunlight is captured by plants for photosynthesis due to reflection, scattering, and absorption by the atmosphere.

8) What adaptation allows camels to survive in desert environments?

Answer: D) All of the above

Explanation: Camels have long legs for mobility, large eyelids to protect against sand, and water storage in their bodies (e.g., fat in humps) to survive deserts.

9) Which ecosystem is known for its unique mix of species due to extreme temperatures?

Answer: D) Tundra

Explanation: The tundra has extreme cold temperatures, leading to unique species adaptations, unlike forests or mangroves.

10) What is the primary role of decomposers in an ecosystem?

Answer: B) To break down dead organic matter

Explanation: Decomposers like fungi and bacteria recycle nutrients by breaking down dead plants and animals, not producing energy or regulating climate.

NEET ADVANCED LEVEL QUESTIONS

More than One Answer Type

11) Which organisms are consumers in the desert ecosystem?

Answer: A) Insects, B) Birds, C) Nocturnal rodents

Explanation: Insects, birds, and nocturnal rodents consume other organisms or plants, making them consumers. Thermophilic fungi are decomposers.

12) What are the main abiotic components of the Coringa mangrove ecosystem?

Answer: A) Marine and fresh water, B) Air, C) Soil, D) Temperature

Explanation: The Coringa mangrove ecosystem relies on abiotic factors like marine and freshwater, air, soil, and temperature, which shape its environment.

13) Which organisms are considered decomposers in the forest ecosystem?

Answer: A) Fungi, B) Bacteria

Explanation: Fungi and bacteria break down dead organic matter in forests, recycling nutrients. Crabs and hydra are not typical forest decomposers.

Assertion and Reason Type

14) Reasoning: Why are mangroves essential despite their relatively small area coverage?

Assertion: Despite their limited extent, mangroves play a crucial role in coastal ecosystems due to their high productivity and provision of vital habitats.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Mangroves, though small in area, are highly productive and support diverse species, serving as critical habitats. The reason explains their importance.

15) Reasoning: How do desert ecosystems challenge the conventional understanding of biodiversity?

Assertion: Desert ecosystems, despite their harsh conditions, exhibit unique species adaptations and interactions, showcasing biodiversity in unexpected ways.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Deserts have unique biodiversity due to specialized adaptations (e.g., water storage), challenging assumptions about low diversity. The reason supports the assertion.

16) Reasoning: How do forest ecosystems demonstrate resilience in the face of disturbances?

Assertion: Forests have evolved mechanisms to recover from natural disturbances such as fires or storms, showcasing their resilience and adaptability.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Forests recover from disturbances through mechanisms like seed banks or regrowth, demonstrating resilience. The reason explains this adaptability.

Matrix Matching Type

17) Match the organism with its role in the ecosystem.

Answer:

Shrimp → B. Consumer

Camel → B. Consumer

Fungi → C. Decomposer

Spirogyra → A. Producer

Explanation: Shrimp and camels consume other organisms (consumers), fungi decompose organic matter (decomposers), and Spirogyra, an alga, produces energy via photosynthesis (producer).

Comprehension Type

18) Questions based on desert shrubs:

i. What are desert shrubs primarily known for in terms of their physical characteristics?

Answer: A) Extensive root systems and thorn-covered stems and leaves

Explanation: Desert shrubs have deep roots to access water and thorns to deter herbivores, key adaptations for survival.

ii. How do desert shrubs survive in the desert environment?

Answer: B) By storing water in their stems and leaves

Explanation: Desert shrubs store water in their tissues to survive prolonged droughts, not by migrating or consuming other plants.

iii. What role do desert shrubs play in the desert ecosystem?

Answer: D) They are the primary producers, harnessing solar energy to sustain life in the desert.

Explanation: Desert shrubs, as primary producers, use photosynthesis to capture solar energy, supporting the desert food chain.

LEARNERS TASK (Page 14 - 16)

NEET LEVEL QUESTIONS

Multiple Choice Questions

1) Which ecosystem is known for being one of the most productive on Earth?

Answer: C) Mangrove

Explanation: Mangroves are highly productive ecosystems due to their rich nutrient cycling and support for diverse species in coastal areas.

2) What is the main source of energy for life on Earth?

Answer: C) Sunlight

Explanation: Sunlight powers photosynthesis, providing the energy that sustains life across ecosystems.

3) Which ecosystem receives fresh water from rivers and salt water from tides?

Answer: C) Mangrove

Explanation: Mangroves thrive in coastal areas where they receive freshwater from rivers and saltwater from tides.

4) What are the main consumers in a desert ecosystem?

Answer: A) Insects, reptiles, birds, and mammals

Explanation: These animals consume plants or other organisms in deserts, unlike fish or crustaceans, which are not typical desert consumers.

5) Which organisms are responsible for breaking down dead plants and animals in forests?

Answer: C) Fungi and bacteria

Explanation: Fungi and bacteria are the primary decomposers in forests, recycling nutrients from dead matter.

6) What is the primary function of mangroves in coastal areas?

Answer: C) Serving as feeding and breeding grounds

Explanation: Mangroves provide critical habitats for feeding and breeding of marine and terrestrial species in coastal ecosystems.

7) Where is the Coringa mangrove located?

Answer: B) South of Kakinada Bay

Explanation: The Coringa mangrove is located south of Kakinada Bay in Andhra Pradesh, India, a well-known mangrove ecosystem.

8) What type of plants store water in their stems to survive dry periods in deserts?

Answer: B) Succulent plants

Explanation: Succulent plants, like cacti, store water in their stems to survive arid conditions, unlike shrubs or grasses.

9) Which organisms are considered decomposers in a desert ecosystem?

Answer: C) Thermophilic fungi and bacteria

Explanation: Thermophilic fungi and bacteria, adapted to extreme conditions, decompose organic matter in deserts.

10) What is the main function of energy flow in an ecosystem?

Answer: C) To sustain life activities

Explanation: Energy flow, starting from the sun, supports growth, reproduction, and other life processes in ecosystems.

NEET ADVANCED LEVEL QUESTIONS

More than One Answer Type

11) What are examples of consumers in the Coringa mangrove ecosystem?

Answer: A) Shrimp, B) Crabs

Explanation: Shrimp and crabs feed on organic matter or other organisms, making them consumers. Spirogyra and mangrove trees are producers.

12) What are the primary producers in the desert ecosystem?

Answer: A) Shrubs, B) Grasses, C) Trees

Explanation: Shrubs, grasses, and trees (where present) perform photosynthesis, acting as primary producers. Spirogyra is not typical in deserts.

13) Which organisms are consumers in the forest ecosystem?

Answer: A) Herbivores, B) Carnivores

Explanation: Herbivores (e.g., deer) and carnivores (e.g., wolves) consume plants or other animals, making them consumers. Decomposers and trees have different roles.

Assertion and Reason Type

14) Reasoning: How do desert plants adapt to survive in harsh conditions?

Assertion: Desert plants, like succulents and shrubs, have specialized features such as storing water or having extensive root systems to withstand low rainfall.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Desert plants' adaptations, like water storage and deep roots, enable survival in low-water conditions. The reason explains the assertion.

15) Reasoning: Why are decomposers relatively scarce in desert ecosystems?

Assertion: Limited organic matter and vegetation in deserts result in fewer decomposers compared to other ecosystems.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Deserts have sparse vegetation and organic matter, limiting decomposer populations. The reason supports the assertion.

16) Reasoning: How do forests impact the environment on regional scales?

Assertion: Forests influence climate, nutrient dynamics, and water movement, thus affecting the surrounding regions.

Answer: A) Both Assertion and Reason are true, and Reason is the correct explanation for Assertion.

Explanation: Forests regulate climate (e.g., carbon sequestration), nutrient cycling, and water flow, impacting regional environments. The reason explains the assertion.

Matrix Matching Type

17) Match the ecosystem type with its characteristic features.

Answer:

Mangrove Ecosystem → C. Highly productive ecosystem located in shallow coastal areas, serving as important breeding grounds.

Desert Ecosystem → B. Supports organisms with adaptations for water conservation and survival in extreme temperatures.

Forest Ecosystem → A. Characterized by high biodiversity and extensive stratification of vegetation layers.

(No match for D, as it seems incomplete in the question.)

Explanation: Mangroves are productive coastal ecosystems, deserts support water-conserving species, and forests have high biodiversity and layered vegetation.

Comprehension Type

18) Questions based on energy flow:

i. Where does the energy that flows through ecosystems originate from?

Answer: C) Sun

Explanation: The sun provides the energy for photosynthesis, initiating energy flow in ecosystems.

ii. What process captures solar energy and converts it into chemical energy in ecosystems?

Answer: C) Photosynthesis

Explanation: Photosynthesis by producers converts solar energy into chemical energy stored in glucose.

iii. What happens to a significant portion of energy as it transfers between trophic levels in a food chain?

Answer: C) It is lost as heat during metabolic activities.

Explanation: During energy transfer between trophic levels, much of the energy is lost as heat due to metabolic inefficiencies, as per the second law of thermodynamics.