

Ecosystem

Case Study Based Questions

Case Study 1

Ecosystem

An ecosystem can simply be defined as the functional unit of nature with which living organisms survive and interact among them and with the physical environment that surrounds them. Ecosystems can broadly be classified into natural and man-made.

Natural ecosystems can further be bifurcated into:

- (a) Terrestrial Ecosystems: These include grasslands, deserts, forests, etc. and
- (b) Aquatic Ecosystems: These ecosystems include water bodies such as wetland, lake, river, estuary, etc. On the other hand, aquariums, croplands etc. are man-made ecosystems. The major or primary function of an ecosystem is the conversion of inorganic materials to organic matter.

Q1. The term 'Ecosystem' was given by:

- a. Odum
- b. A.G. Tansley
- c. Hatch - Slack
- d. Robert Hooke

Q2. The biotic and abiotic components are linked with each other through..... energy flow and material flow.

- a. bidirectional, cyclic
- b. cyclic, bidirectional
- c. unidirectional, cyclic
- d. cyclic, unidirectional

Q3. Living organisms are produced through:

- a. biological evolution
- b. physical evolution
- c. bio-chemical evolution
- d. chemical evolution



Q4. What does a biotic community called when it is regulated by abiotic components?

- a. Biomass
- b. Biosphere
- c. Ecosystem
- d. Bio-geography

Q5. What makes an ecosystem healthy and maintained?

- a. Bio-geochemical cycle
- b. Energy-flow
- c. Cycling of nutrients
- d. All of these

Answers

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

Case Study 2

Productivity

Productivity is the rate of biomass production. It is expressed in $\text{gm}^2 \text{yr}^{-1}$ or $(\text{kcal m}^2) \text{yr}^{-1}$. The amount of biomass or organic matter produced per unit area over a time period by plants during photosynthesis is called primary production. The primary productivity can be divided into Gross Primary Productivity (GPP) and Net Primary Productivity (NPP). NPP is the available biomass for the consumption to heterotrophs, i.e. herbivores and decomposers. Annual net primary productivity of the whole biosphere is about 170 billion tonnes (dry weight) of organic matter. Of this, despite of occupying about 70% of the surface of earth, the productivity of the oceans is only 55 billion tonnes.

Q1. Its value depends on the chlorophyll content.

- a. Primary productivity
- b. GPP
- c. NPP
- d. Secondary productivity



Q2. GPP.....+ Respiratory loss.

- a. NPP
- b. Primary productivity
- c. Secondary productivity
- d. GPP

Q3. The amount of storage of organic matter not used by heterotrophs (consumers) is known as

- a. NPP
- b. Primary productivity
- c. Secondary productivity
- d. GPP

Q4. In aquatic habitat, productivity.....with the increasing depth.

- a. increases
- b. becomes high
- c. becomes low
- d. decreases

Q5. What is right option for productivity in desert, grasslands and forest?

- a. High, medium, low
- b. Medium, high, low
- c. Low, medium, high
- d. High, low, medium

Answers

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

Case Study 3

Energy Flow

Living organisms, depend on each other for their food requirement and form a chain called food chain. The transfer of food energy from producers, through a series of



organisms is known as food chain. (Herbivores - Carnivores - Decomposers). Food chain starts from primary producers and ends with carnivores. The animals are inter-dependent for food and they form a net which is termed as a food web. Trophic level is one kind of producer- consumer arrangement, where each food level provides "successive levels of nourishment in the food chain and food web of a community."

Q1. Grazing food chain begins with

- a. decomposers
- b. carnivores
- c. producers
- d. consumers

Q2. 'Detritus' means:

- a. primary source of energy is dead organic matter.
- b. secondary source of energy is dead organic matter.
- c. primary source of energy is living organic matter.
- d. primary source of energy is living inorganic matter.

Q3. Which term is used for indicating interdependent food in net form?

- a. Food chain
- b. Food web
- c. Nutrient web
- d. All of these

Q4. How do flow of energy and nutrient-cycling represented in an ecosystem?

- a. By structure and function
- b. By nutrient pyramid
- c. By composition of ecosystem
- d. Food chain

Q5. In the arrangement of producers and consumers, each food level is known as:

- a. food chain
- b. food web
- c. trophic level
- d. food level

Answers

1. (a)
2. (a)
3. (b)
4. (d)
5. (c)

Case Study 4

Decomposition

Decomposition is the breaking down of complex organic substrates into simpler inorganic forms by decomposers. The various steps of decomposition are:

Fragmentation: Breaking down of detritus into smaller particles by the action of detritivores such as fungi, earthworm, etc. **Leaching:** Downward movement of water-soluble nutrients into the soil horizon and their precipitation as insoluble salts.

Catabolism: Break down of detritus into simpler inorganic forms by enzymes from fungi and bacteria.

Humification: Formation and continuous deposition of a dark amorphous substance known as the humus.

Mineralisation: The further breakdown of humus by some microorganisms to form simple inorganic nutrients.

Read the given passage carefully and give the answer of the following questions:

Q1. What do you mean by decomposition?

Ans. The process by which dead or complex organic material is broken down into simpler forms of matter which mixes with soil is called decomposition.

Q2. What do decomposers need to eat to live and grow?

Ans. Decomposers need dead matter to eat to live and grow.

Q3. Name any three common decomposers of an ecosystem.

Ans. Bacteria, fungi, earthworms.

OR

When humus is degraded, salts and ions are released in the forms which are available to plants. What is this called?

Ans. Mineralisation

