

# Class 12 Biology Chapter 12 Ecosystem Extra Questions **Answers at the Bottom**

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## Ch-12 Ecosystem

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- The metabolic process which causes a reduction in gross primary production
  - digestion
  - excretion
  - respiration
  - transportation
- Which of the following can be categorised as a photoautotroph?
  - Cuscuta
  - Euglena
  - Hydra
  - Rafflesia
- An ecological succession on bare land proceeds towards
  - Increasing wetness
  - Increasing fossils
  - Increasing dryness
  - Decreasing wetness
- Sparrow is
  - only 1<sup>o</sup> consumer
  - only 2<sup>o</sup> consumer
  - both 1<sup>o</sup> consumer and 2<sup>o</sup> consumer
  - 3<sup>o</sup> consumer
- The individual transitional communities are termed seral stages or
  - Seral species
  - Seral communities
  - Seral organisms
  - Climax organisms
- What are decomposers? What is their function in the ecosystem?
- No energy that is trapped into an organism remains in it forever. (True/False)
- Mention the role of pioneer species in primary succession on rocks.
- List the four important changes, taking place during biotic succession.
- The temperate regions show a lower value of primary productivity as compared to tropical regions. Give two reasons.
- Distinguish between: Grazing food chain and detritus food chain.

12. Distinguish between: Production and Decomposition
13. Describe the components of an ecosystem.
14. Describe the process of decomposition of detritus under the following heads Fragmentation, Leaching, Catabolism, Humification and Mineralization.
15. What is primary productivity? Give brief description of factors that affect primary productivity.

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### Answer

1.
  - c. respiration, **Explanation:** Net primary production is the rate at which all the plants in an ecosystem produce net useful chemical energy; it is equal to the difference between the rate at which the plants in an ecosystem produce useful chemical energy (GPP) and the rate at which they use some of that energy during respiration.  
So respiration is the metabolic process which causes a reduction in gross primary production.
2.
  - b. Euglena, **Explanation:** Photoautotrophs are organism that perform photosynthesis in presence of sunlight. Euglena contains chlorophyll and fixes the solar energy so, it acts as photoautotrophs.
3.
  - a. Increasing wetness, **Explanation:** An ecological succession on bare land proceeds towards increasing wetness. Availability of water help in faster growth of organism including plants.
4.
  - c. both 1<sup>o</sup> consumer and 2<sup>o</sup> consumer, **Explanation:** Sparrow feeds on fruits as well insects. Herbivores or plant eaters are primary consumer and carnivores that feed on herbivores are secondary consumer. So, Sparrow occupy both primary and secondary trophic levels.
5.
  - b. Seral communities, **Explanation:** A seral community or seral stage is an intermediate stage found in ecological succession in an ecosystem advancing towards its climax community. In many cases more than one seral stage evolves until climax conditions are attained.  
A prisere is a collection of seres making up the development of an area from non-vegetated surfaces to a climax community.
6. Decomposers are saprophagous / saprotrophs, which feed on dead bodies of organisms and organic wastes of living organisms.
  - They bring about decomposition and mineralisation of the dead matter to release them back for reuse by the autotrophs.

7. True

8. In primary succession on rocks, the pioneer species invade a bare area and give way for other species to grow.

9.

1. Small short lived plants (r-selection) to large long-lived plants (k-selection)
2. Unstable biotic community to stable biotic community.
3. Little diversity to a high degree of diversity.
4. Aquatic or dry conditions to mesic conditions.

10.

1. It is severely limited by a cold climate.
2. Temperate regions have short snow-free growing period in a year

11.

- Grazing food chain starts with green plants while detritus food chain starts with dead organic matter.
- Organic matter is decomposed in detritus but not in grazing.
- Grazing web adds energy into the ecosystem.
- Detritus has sub soil organisms while grazing web has macroscopic organisms.
- Grazing web helps in fixing inorganic nutrients. Detritus helps in fixing the inorganic nutrients.
- Grazing begins with green plants at the producer level while detritus begins with decomposers at the first trophic level.
- Solar energy is used in grazing web. Energy for detritus comes from the remains of detritus.
- Less fraction of energy flows through grazing web as compared to detritus.

12.

	Production	Decomposition
1.	It is the process of formation of fresh biomass from inorganic matter by the producers (plants) using sunlight.	It is the process by which complex organic material is broken down by the decomposers.
2.	Energy is trapped in this process.	Energy is released in this process.
3.	It requires sunlight.	It does not require sunlight.
4.	It is an anabolic process.	It is a catabolic process.
5	Example: Plants	Examples: Bacteria, Fungi

13. There are two components of the ecosystem:

1. **Biotic** : biotic factors are the factors in a biome/ecosystem/habitat that include all living things. This can later be broken down into producers, consumers decomposers, and scavengers. Abiotic factors are the ones that are nonliving. Biotic components are the living things that shape an ecosystem. They are, any living component that affects another organism. Such things include animals which consume the organism in question and the living food that the organism consumes.
2. **Abiotic**: Abiotic components are non-living chemical and physical factors in the environment. Abiotic phenomena underlie all of biology. Abiotic factors, while generally downplayed, can have enormous impact on evolution. From the viewpoint of biology, abiotic influences may be classified as light or more generally radiation, temperature, water the chemical surrounding composed of the terrestrial atmospheric gases, as well as soil. The macroscopic climate often influences each of the above. Not to mention pressure and even sound waves if working with marine, or deep underground biome.

14. **Decomposition**: It is a process in which decomposers break down complex organic matter into inorganic substances like carbon dioxide, water and nutrients and the process is called decomposition. Dead plant remains such as leaves, bark flower and raw material of animals, including fecal matter, constitute detritus, which is the raw material for decomposition.

The important steps in the process of decomposition are fragmentation, leaching, catabolism, humification and mineralization.

1. **Fragmentation**: Detritivorous like earthworm breakdown detritus into smaller particles. This process is called fragmentation.
2. **Leaching**: By this process water soluble inorganic nutrients go down into the soil horizon and get precipitated as unavailable salts.
3. **Catabolism**: Bacterial and fungal enzymes degrade detritus into simpler inorganic substances. This process is called as catabolism.
4. **Humification**: It leads to accumulation of a dark coloured amorphous substance called humus which is highly resistant to microbial action and undergoes decomposition at an extremely slow rate. Being colloidal in nature it serves as a reservoir of nutrients.
5. **Mineralization**: The humus is further degraded by some microbes and release of inorganic nutrients occur by the process of mineralization.

15. Primary production is the amount of biomass or organic matter produced per unit area over a time period by plants during photosynthesis.

**Factors:** Primary productivity depends upon sunlight, temperature, moisture, nutrients and photosynthetic efficiency of producers.

1. **Sunlight:** Maximum sunlight is available in tropics. There is a progressive reduction of its availability towards the poles. Therefore more photosynthesis and high productivity occurs in tropics. It decreases progressively towards the poles.
2. **Temperature:** Temperate forests have lesser productivity as compared to tropical forests due to cold climate during winter.
3. **Nutrients:** A regular availability of nutrients is required for sustaining plant growth and productivity of an ecosystem.