

EXERCISE QUESTIONS

CHAPTER-14 ECOSYSTEM

1. Fill in the blanks.

(a) Plants are called as _____ because they fix carbon dioxide.

(b) In an ecosystem dominated by trees, the pyramid (of numbers) is _____ type.

(c) In aquatic ecosystems, the limiting factor for the productivity is _____.

(d) Common detritivores in our ecosystem are _____.

(e) The major reservoir of carbon on earth is _____.

Ans –(a) producers

(b) upright

(c) availability of sunlight

(d) bacteria, fungi and earthworm

(e) oceans

2. Which one of the following has the largest population in a food chain?

(a) Producers

(b) Primary consumers

(c) Secondary consumers

(d) Decomposers

Ans - (d) Decomposers

3. The second trophic level in a lake is

(a) Phytoplankton

(b) Zooplankton

(c) Benthos

(d) Fishes

Ans - (b) Zooplankton

Zooplankton are primary consumers in aquatic food chains that feed upon phytoplankton.

4. Secondary producers are

(a) Herbivores

(b) Producers

(c) Carnivores

(d) None of the above

Ans - (a) Herbivores

5. What is the percentage of photosynthetically active radiation (PAR) in the incident solar radiation?

(a) 100% (b) 50 %

(c) 1-5% (d) 2-10%

Ans – (b) 50%

6. Distinguish between

(a) Grazing food chain and detritus food chain

(b) Production and decomposition

(c) Upright and inverted pyramid

(d) Food chain and Food web

(e) Litter and detritus

(f) Primary and secondary productivity

Ans - (a) Grazing food chain and detritus food chain

	Grazing food chain	Detritus food chain
1.	In this food chain, energy is derived from the Sun.	1. In this food chain, energy comes from organic matter (or detritus) generated in trophic levels of the grazing food chain.
2.	It begins with producers, present at the first trophic level. The plant biomass is then eaten by herbivores, which in turn are consumed by a variety of carnivores.	2. It begins with detritus such as dead bodies of animals or fallen leaves, which are then eaten by decomposers or detritivores. These detritivores are in turn consumed by their predators.
3.	This food chain is usually large.	3. It is usually smaller as compared to the

		grazing food chain.
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Production	Decomposition
It is the process of formation of organic matter by producers by means of photosynthesis	It is the process of breakdown of complex organic matter into simple organic molecules
It requires sunlight	It can take place in the absence of sunlight also

(c) Upright and inverted pyramid

Upright pyramid	Inverted pyramid
1. The pyramid of energy is always upright.	1. The pyramid of biomass and the pyramid of numbers can be inverted.
2. In the upright pyramid, the number and biomass of organisms in the producer level of an ecosystem is the highest, which keeps on decreasing at each trophic level in a food chain.	2. In an inverted pyramid, the number and biomass of organisms in the producer level of an ecosystem is the lowest,

(d) food chain and food web

Food chain	Food web
A series of living organisms present at different trophic levels and related to food habits	An interconnected web of a number of food chains.
The members at higher trophic level feed upon the members of lower trophic levels.	Different organisms have more than one food sources

7. Describe the components of an ecosystem.

Ans - An ecosystem is described as an interdependent system that consists of both the area's non-living and living inhabitants. The processes of nutrient cycling, energy flow, decomposition, and productivity show how the living and non-living parts of an ecosystem interact with one another and work as a unit. Numerous ecosystems exist, including ponds, forests, grasslands, and others. An ecosystem is made up of two parts, which are: Biotic element: It is the part of an ecosystem that is alive and consists of biotic elements including producers, consumers, decomposers, etc. Algae and plants are producers. Since they are pigmented with chlorophyll, they can perform photosynthesis in the presence of light. They are sometimes known as converters or transducers as a result.

8. Define ecological pyramids and describe with examples, pyramids of number and biomass.

Ans - An ecological parameter, such as number, biomass, or energy, is graphically represented as a pyramid in the various trophic levels of a food chain, with producers at the bottom, herbivores in the middle, and carnivores at the top. Ecological pyramids can be spindle-shaped, upright, or inverted. The pyramid of numbers, the pyramid of biomass, and the pyramid of energy are the three main forms of ecological pyramids.

1. The pyramids of numbers show the amount of people in a given area at different trophic levels. Although it is typically upright, the pyramid of numbers in the case of a large tree is typically inverted because the number of insects that feed on the tree is typically greater.
2. Pyramids of biomass- It represents the biomass in various trophic levels. A pyramid of biomass is upright except in an aquatic food chain. A pyramid of biomass in the sea is generally inverted because the biomass of fishes is generally more than that of phytoplankton.
3. Pyramids of energy- It is the graphic representation of the amount of energy trapped at different trophic levels per unit area. Pyramid of energy is always upright.

9. What is primary productivity? Give brief description of factors that affect primary productivity.

Ans - It is described as the volume of organic matter or biomass generated by farmers on a sustained basis per unit area. An ecosystem's primary production is influenced by a wide range of environmental elements, including light, temperature, water, precipitation, and others. Additionally, it is reliant on the availability of nutrients and plants that can perform photosynthesis.

10. Define decomposition and describe the processes and products of decomposition.

Ans - Decomposition is the physical and chemical conversion of complex organic residues into inorganic basic materials for recycling. Decomposers carry out this process.

Process: During decomposition, three different sorts of processes take place. They are catabolism, leaching, and debris fragmentation.

i. Detritus fragmentation is the breaking down of dead plants and animals into tiny pieces.

ii. Catabolism: This process involves the secretion of digestive enzymes by organisms that degrade debris. Complex organic chemicals that are insoluble are broken down into simpler, soluble organic compounds and inorganic materials.

iii. Leeching: The water percolates into the deeper soil layers together with the more easily soluble compounds that are produced during decomposition.

Humus and inorganic minerals or nutrients are two results of the breakdown process.

11. Give an account of energy flow in an ecosystem.

Ans - All living things are either directly or indirectly reliant on producers for their food. Energy travels in a single way, first from the sun to producers,

then to consumers. Plants make food by using photosynthetically active radiation (PAR), which is a type of light. Animals are referred to be consumers because they eat nourishment from plants. A food chain is the term used to describe the process of eating and being eaten, in which energy moves from producers to consumers. For instance, in the grazing food chain, goats consume the grass before man consumes it. Similar to this, the first component of the detritus food chain is dead organic matter. It is composed of heterotrophic creatures called decomposers (fungi and bacteria). Additionally called saprotrophs, these are.

12. Write important features of a sedimentary cycle in an ecosystem.

Ans - The Earth's crust or rocks serve as the reservoirs for sedimentary cycles. The sediments of the Earth include nutrient components. Sedimentary cycles exist for a number of elements, including calcium, phosphorus, potassium, and sulphur. Cycles of sedimentation move quite slowly. They are regarded as less ideal cycles since they take a long time to complete their circulation. This is due to the possibility that during recycling, nutritional components could become trapped in the reservoir pool, making it very difficult for them to escape and continue circulation. As a result, it typically disappears from circulation for a long time.

13. Outline salient features of carbon cycling in an ecosystem.

Ans - The atmosphere serves as the reservoir for the crucial gaseous cycle known as the carbon cycle. Carbon is an essential component of every living thing. All living things contain the essential element carbon. All biomolecules, including the lipids, proteins, and carbohydrates needed for life's functions, are composed of carbon. Through a fundamental process known as "photosynthesis," carbon gets absorbed into living things. In the process of photosynthesis, the carbon compound "glucose" is created by

combining sunlight and atmospheric carbon dioxide. Other living things need this glucose molecule. Thus, living things contain atmospheric carbon. To complete the cycle, it is now necessary to recycle this absorbed carbon dioxide back into the atmosphere.