

## NCERT Solutions for class 12 biology chapter 14 ecosystem: Solved Exercise Questions

Q1. How is diapause different from hibernation?

**Answer:**

Differentiation between diapause and hibernation:

Diapause	Hibernation
It is a state of suspended development to cope with unfavourable conditions	A state in which animals escape winters by entering into a resting state in which their metabolism slows down.
Zooplanktons and insects show diapause	Hibernation is shown by bats, squirrels and rodents

Q1. Fill in the blanks. (a) Plants are called as \_\_\_\_\_ because they fix carbon dioxide.

**Answer:**

Plants are called as autotrophs because they fix carbon dioxide.

Q1. Fill in the blanks. (b) In an ecosystem dominated by trees, the pyramid (of numbers) is \_\_\_\_\_ type.

**Answer:**

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

**Q1. Fill in the blanks.**

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

**Answer:**

In aquatic ecosystems, the limiting factor for productivity is light .

**Q1 . Fill in the blanks.**

(d) Common detritivores in our ecosystem are \_\_\_\_\_.

**Answer:**

Common detritivores in our ecosystem are earthworms

**Q1. Fill in the blanks.**

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

**Answer:**

The major reservoir of carbon on earth is ocean.

**Q2 . Which one of the following has the largest population in a food chain?**

(a) Producers

(b) Primary consumers

(c) Secondary consumers

(d) Decomposers

**Answer:**

(d) Decomposers

Decomposers are microorganisms including fungi and bacteria. These break down the remains of dead plants and animals. Decomposers form the largest community of organisms in a food chain.

**Q3. The second trophic level in a lake is**

(a) Phytoplankton

(b) Zooplankton

(c) Benthos

(d) Fishes

**Answer:**

(b) Zooplankton

In a lake, the first trophic level is formed by phytoplankton while the second trophic level is formed by zooplankton.

**Q4. Secondary producers are:**

(a) Herbivores

- (b) Producers
- (c) Carnivores
- (d) None of the above

Answer:

- (d) None of the above

In a food chain, plants are the only producers, there are no other producers. Herbivores and carnivores are primary and secondary consumers respectively.

**Q5. What is the percentage of photosynthetically active radiation (PAR) in the incident solar radiation?**

- (a) 100%
- (b) 50 %
- (c) 1-5%
- (d) 2-10%

**Answer:**

- (b) 50%

Out of total incident solar radiation, 50 % is formed by photosynthetically active radiation

**Q6. Distinguish between**

(a) Grazing food chain and detritus food chain

**Answer:**

Grazing food chain	Detritus food chain
Solar energy is utilised	Biomass energy stored in bodies of plants and animals is utilised
The grazing food chain starts from producers	The detritus food chain starts from detritus i.e. dead plants and animals
It includes a number of trophic levels	Detritus food chain includes a lesser number of trophic levels

**Q6. Distinguish between**

(b) Production and decomposition

**Answer:**

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
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**Q6. Distinguish between**

**(c) Upright and inverted pyramid**

**Answer:**

Upright pyramid	Inverted pyramid
Upright pyramids show a decrease in number and biomass from producer level to the tertiary consumer level	Inverted pyramids depict an increase in number and biomass from producer level to tertiary consumer level
Pyramid of energy is upright	Pyramid of biomass and number can be inverted

**Q6. Distinguish between**

**(d) Food chain and Food web**

**Answer:**

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

**Q6. Distinguish between (e) Litter and detritus**

**Answer:**

Litter	Detritus
The term litter refers to any kind of waste generated	The term detritus refers to the dead waste of plants and animals bodies
Litter can be biodegradable as well as non- biodegradable	Detritus is biodegradable

**Q6. Distinguish between (f) Primary and secondary productivity**

**Answer:**

Primary productivity	Secondary productivity
Primary productivity refers to the amount of organic matter produced by producers per unit area over a period of time	Secondary productivity refers to the rate of production of organic matter by consumers over a period of time

**Q7. Describe the components of an ecosystem.**

**Answer:**

An ecosystem refers to be the functional unit of nature in which living organisms interact among themselves and also with their surrounding physical environment in order to perform nutrient cycling, energy flow, decomposition and productivity. There are many types of ecosystems such as pond ecosystem, forest ecosystem etc.

Components of ecosystem

The components of the ecosystem can be divided into abiotic components and biotic components

1. Abiotic components- These include the non-living components of nature such as light, temperature, water, soil, air, inorganic nutrients etc.

2. Biotic components- The biotic components of an ecosystem refer to the living organisms present in that ecosystem. The biotic components are divided as producers, consumers and decomposers. Producers are plants, consumers include animals which can be herbivores or carnivores and decomposers include microorganisms like fungi and bacteria.

**Q8.** Define ecological pyramids and describe with examples, pyramids of number and biomass.

**Answer:**

Ecological pyramid- The graphical representation of an ecological parameter such as number, biomass or energy, sequence wise in various trophic levels of a food chain in which producers are at the base, herbivores in the middle and carnivores at the top level. Ecological pyramids can be upright, inverted, or spindle-shaped. The three common types of ecological pyramids include the pyramid of number, pyramid of biomass and pyramid of energy.

1. Pyramids of number- It is the number of individuals per unit area at various trophic levels. It is generally upright, however, the pyramid of number in case of a big tree is generally inverted because number of insects that feed on tree generally exceeds in number.

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.

**Q9.** What is primary productivity? Give brief description of factors that affect primary productivity.

**Answer:**

Primary productivity refers to the amount of organic matter or biomass produced by producers per unit area over a period of time. The primary productivity of an ecosystem depends upon a number of factors such as light, temperature, water, precipitation, availability of nutrients etc.

**Q10.** Define decomposition and describe the processes and products of decomposition.

**Answer:**

Decomposition is the process of breaking down of complex organic matter of detritus into inorganic substances such as carbon dioxide, water and nutrients. Dead remains of plants and animals constitute detritus. The process of decomposition involves steps like fragmentation, leaching, catabolism, humification and mineralization.

1. Fragmentation of Detritus- In this step, the detritus is broken down into small fragments by earthworms

2. Leaching- In leaching the water-soluble nutrients, seep down into the soil and become unavailable salts.

3. Catabolism- The small fragments of decomposed by decomposers like fungi and bacteria with the help of action of enzymes.

4. Humification- In this step, humus is formed. Humus is a dark coloured, amorphous solid substance that acts as a nutrient reserve.

5. Mineralization- In this step by the action of microbes, the inorganic nutrients are released from the humus.

**Q11. Give an account of energy flow in an ecosystem**

**Answer:**

Energy Flow in an ecosystem:

All living organisms are dependent for their food on producers, directly or indirectly. There is a unidirectional flow of energy from the sun to producers and then to consumers. Photosynthetically active radiation (PAR) is responsible for the synthesis of food by plants. Animals obtain their food from plants, so they are called consumers. The process of eating and being eaten is called a food chain in which energy flows from producers to consumers. For example, in Grazing food chain, the grass is eaten by goats which are further eaten by man. Similarly, in the detritus food chain, the sequence begins with dead organic matter. It is made up of decomposers which are heterotrophic organisms (fungi and bacteria). These are also known as saprotrophs. Decomposers secrete digestive enzymes that breakdown dead and waste materials into simple, inorganic materials, which are subsequently absorbed by them. Natural interconnection of food chain forms the food web. Thus, in an ecosystem, energy flow occurs through food chains and food webs.

**Q12. Write important features of a sedimentary cycle in an ecosystem.**

**Answer:**

The important features of the sedimentary cycle are as follows:

1. These nutrient cycles have their reservoirs in the Earth's crust.
2. Sulphur, calcium, phosphorous etc have sedimentary cycles.
3. Sedimentary cycles are slow, they take more time to complete their circulation and are considered less perfect cycles

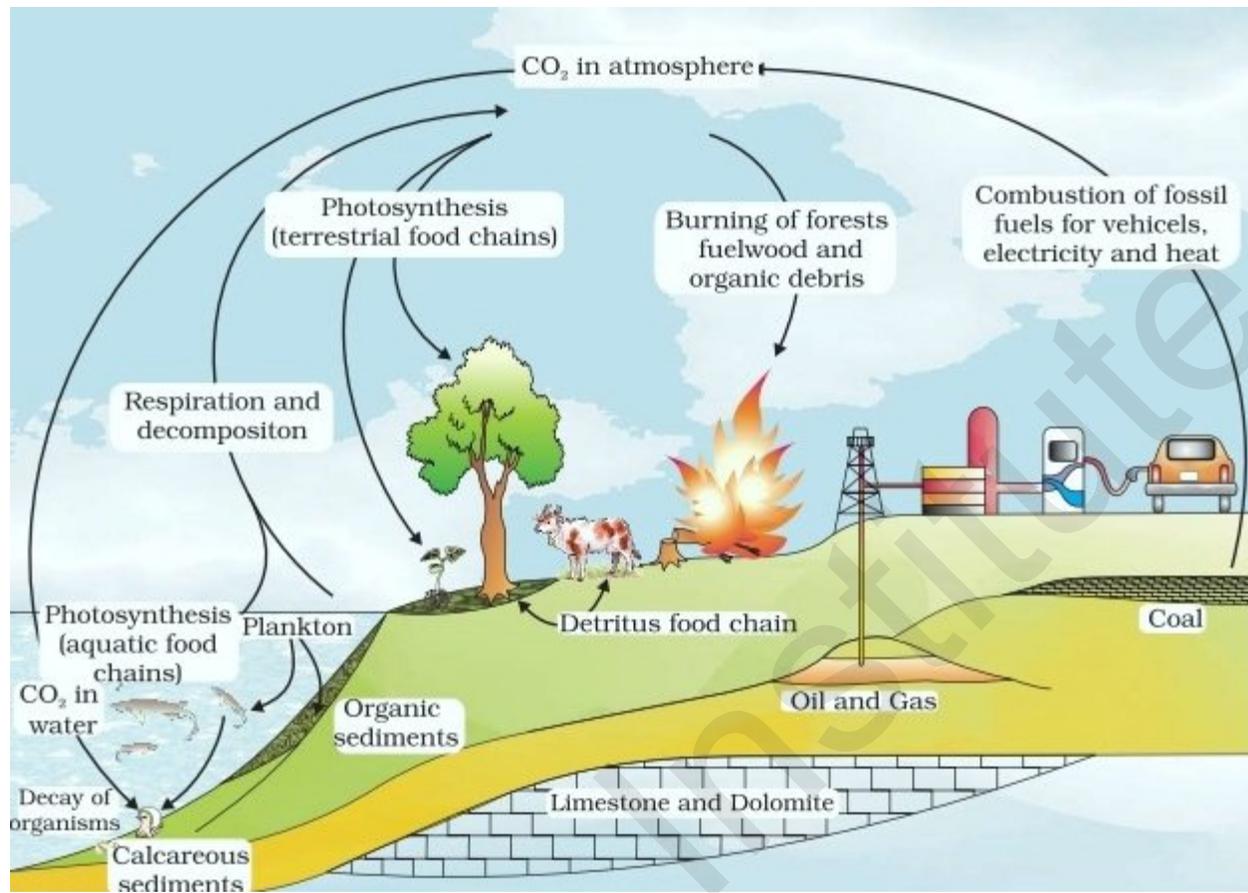
**Q13.** Outline salient features of carbon cycling in an ecosystem.

**Answer:**

Salient features of carbon cycling are as follows

1. Carbon cycling occurs through atmosphere, ocean and through the living and dead organisms.
2. Most of the carbon is fixed by plants during the process of photosynthesis and returns to the atmosphere in the form of CO<sub>2</sub> during respiration.
3. Burning of wood, forest fire and combustion of organic matter, fossil fuel, and volcanic activity are some other sources of releasing CO<sub>2</sub> in the atmosphere.

An outline of C-cycle is depicted in the figure given below:



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