Chapter 7: Energy Flow in an Ecosystem

Question. 1. Fill in the blanks:
(1) There is a definite sequence in these interactions which is called the **food chain**.
(2) Each level in the food chain is called a **trophic level**.
(3) The **sun** is the most important source of energy in any ecosystem.
(4) The **gaseous cycle** is a speedier cycle than the sedimentation cycle.
(5)

Question. 2. Find the odd one out and give reason:
(1) Bat, Elephant, Squirrel, Bear.
Answer: Bear. (The others are primary consumers.)
(2) Deer, Tiger, Eagle, Leopard.
Answer: Deer. (The others are apex carnivores.)
(3) Crow, Pig, Frog, Vulture.
Answer: Frog. (The others are detritivores.)
(4) Frog, Owl, Fox, Deer.
Answer: Deer. (The others are secondary consumers.)
(5) Worm, Shellfish, Sparrow, Crab.
Answer: Sparrow. (The others are detritivores.)

Question 3. Find the correlation between the first given pair and rewrite the answer:
(1) Rabbit: Primary consumer:: Hawk: **Apex consumer**
(2) Plants: Producers:: Bacteria: **Decomposers**
(3) Tundra: Land biome:: Ocean: **Aquatic biome**
(4) Address of living organism in an eco- system: Habitat:: Role/Profession of living organism in an ecosystem: **Niche**
(5) Producer: Autotroph:: Consumer: **Heterotroph**.

Question 4. Difference between:
(1) Gaseous cycle and

Gaseous cycle	**Sedimentary cycle**
An accumulation of the main abiotic gaseous nutrient materials is found in the earth's atmosphere.	An accumulation of the main abiotic nutrient materials is found in soil, sediment and sedimentary rocks, etc. of the earth.
Includes nitrogen, oxygen, carbon dioxide, water vapour, etc.	Includes soil components like iron, calcium, phosphorus, etc

(2) Producer and Consumer:

Producer	**Consumer**
Producer is autotrophic.	Consumer is heterotrophic.
Producers form the first trophic level of food chain and food web.	Consumers form the second, third and apex trophic level of food chain and food web.
Producers trap the solar energy and convert it into chemical energy.	Consumers, make use of chemical energy of food and use it for its nutrition.
Most plants in the world are producers.	Animals in the world are consumers.

Question 4. Define the following:
(1) Omnivores: Those, who feed on plant matter as well as animal matter are omnivores.
(2) Ecosystem: The biotic and abiotic factors in an environment and their interactions with one another form an ecosystem.

(3) Bio-geochemical cycle: The cyclic path in which nutrients are transferred through air, water or soil into the bodies of living organisms and back to the air, water and soil is called a bio-geochemical cycle.
(4) Energy pyramid or pyramid of energy: Pattern of energy exchange in an ecosystem is called pyramid of energy.
(5) Food chain: Linkages of organisms within an ecosystem with respect to eating and being eaten is called a food chain.
(6) Food web: The intricate network of intertwining of food chains with one another is called Food web.
(7) Decomposers: Organisms that decompose and break down the organic matter obtained from dead and decaying bodies into inorganic nutrients and return them into the soil are called decomposers.

Question 5: Complete the paragraph by choosing the words given in the bracket:
(apex, biotic, Carnivores, Herbivores, proteins, carbon dioxide)

Plants convert carbon dioxide into carbohydrates by the process of **photosynthesis**.

Similarly, they produce carbon compounds like **proteins** and fats, too. **Herbivores** feed upon plants. **Carnivores** feed upon herbivores. In this way, **biotic** carbon is transported from plants to herbivores, from herbivores to carnivores and from carnivores to **apex** consumers.

Question 5. Answer the following questions:
(1) Explain in detail the interrelationship between the food chain and food webs.
Answer. (1) In every ecosystem, interaction go on continuously between producers, consumers and saprophytes.
(2) These interactions follow a definite sequence called the food chain.
(3) Each food chain consists of four, five or more links.
(4) An ecosystem consisting of interconnected food chains at various levels constitute a food web.

(2) What type of changes occur in the amount of energy during its transfer from plants to apex consumers?

Answer. (1) Green plants of the ecosystem store large amount of energy in the form of carbohydrates and proteins.

(2) Before reaching the decomposers, this energy is passed through different trophic levels like primary consumer, secondary consumer, tertiary consumer, etc.

(3) The level of energy goes on decreasing while moving through one trophic level to the other because some amount of energy is liberated in the form of heat.

(4) The apex consumer receives the least amount of energy.

(3) Write the main process of carbon cycle:

Answer:

Main processes in the carbon cycle

$$6\,CO_2 + 12\,H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} C_6H_{12}O_6 + 6\,H_2O + 6\,O_2\uparrow$$

$$C_6H_{12}O_6 + 6\,O_2 \xrightarrow{\text{Mitochondria}} 6\,CO_2\uparrow + 6\,H_2O + \text{Energy}$$

(4) Define food chain. Construct one food chain.

Answer:

Food Chain: Interactions go on continuously between producers, consumers and saprophytes. There is a definite sequence in these interactions which is called the food chain.

Food chain Constructing:

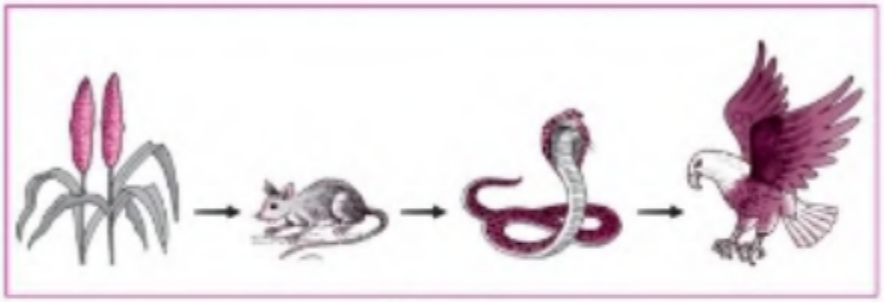


Fig. 7.9

Grain (Producer) → Rat (Primary consumer) → Snake (Secondary consumer) → Hawk (Apex carnivore)

OR

Fig. 7.11

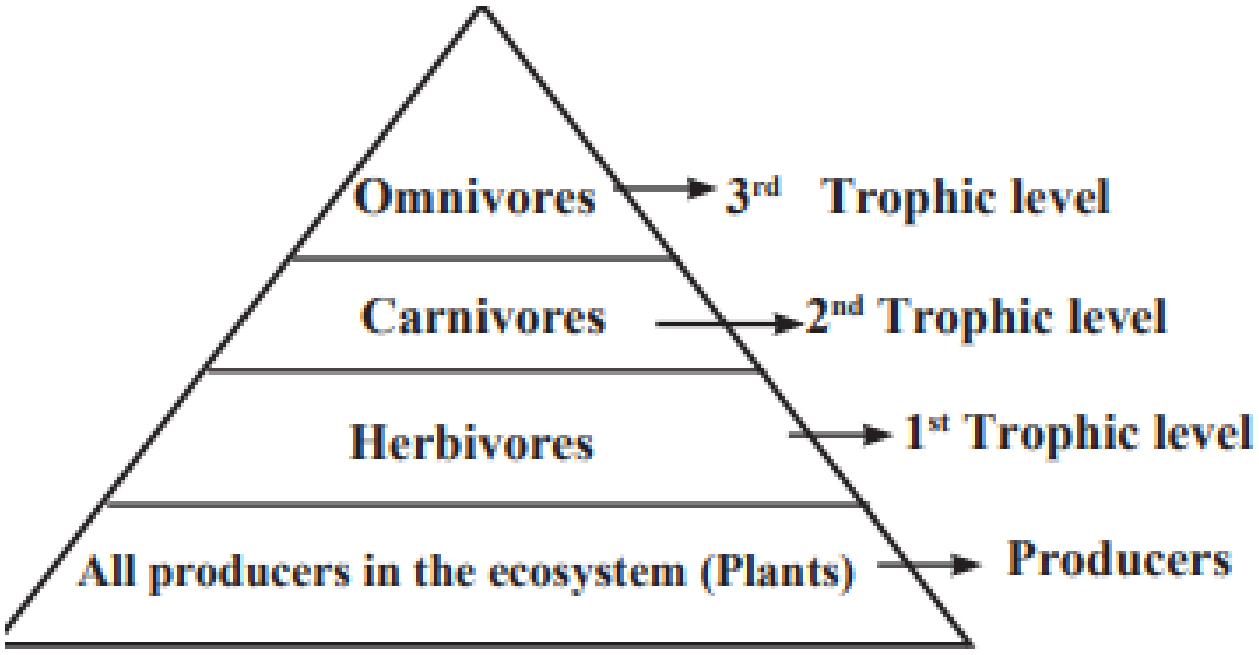
Grass (Producer) | Goat (Primary consumer) | Tiger (Secondary consumer)

OR

Fig. 7.10

Plant Plankton (Producer) | Small fish (Primary consumer) | Big fish (Secondary Consumer) | Bird (Kingfisher) (Apex carnivore)

Question 6. Draw neat and well labelled diagram of:
(1) Tropic level:



(2) Oxygen cycle