



CLASS X
BIOLOGY
CHAPTER 17
OUR ENVIRONMENT

SOLUTIONS

TEXTUAL QUESTIONS AND ANSWERS

Let us answer. (Page 317)

1. Why are some substances biodegradable and some non-biodegradable?

Ans: The process of degradation of wastes requires specific enzymes produced by micro-organisms. Organic matter can be acted upon by enzymes easily and are broken down in nature whereas man made materials are not easily acted upon by micro-organisms. Therefore, some substances are **biodegradable** and some are **non-biodegradable**.

2. Explain how biodegradable substances would affect environment?

Ans: **Biodegradable substances** can be broken down naturally into harmless products. They create great environmental problem when release in the environment beyond the capacity of nature to degrade them. Moreover, they destroy the natural beauty of our surrounding, release foul smell and may provide breeding ground of many vector borne diseases.

3. Explain how non-biodegradable substances would affect environment?

Ans: **Non-biodegradable wastes** such as pesticides cause serious environmental problems or pollution, their **(plastics, polythene)** recycling release toxic gases, also degrade soil. It may enter our body through food chain and cause harmful effect. They persist in the environment for long period of time or may harm various members of ecosystem. A number of synthetic chemicals like **CFCs cause ozone depletion**.

Let us answer (Page 320)

1. How does sun act as the source of energy for all the organisms on earth?

Ans: In an ecosystem, green plants trap solar energy and converted it into food. The foods manufactured by the green plants are utilized by themselves and also by herbivores which are then passes on consumers. Thus, sun act as the source of energy for all the organisms on earth through **food chain**.



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2. How does food chain differ from food web?

Ans: The differences between food Chain and food web are listed below:

| DIFFERENCES | |
|--|--|
| FOOD CHAIN | FOOD WEB |
| 1. The transfer of food energy from one population to another population is called food chain. | 1. It is the interconnected pattern of food chain at various trophic levels. |
| 2. It is linear in structure. | 2. It is web like in structure. |
| 3. It consists of only one chain and is not realistic in nature. | 3. It consists of many food chains and is realistic in nature. |
| 4. There is no alternate source of food. | 4. It can provide alternate source food. |

3. Give two functions of insects in our ecosystem?

- a) Insects are best pollinators and also help in dispersal of spores.
- b) Insects are good prey for many animals like spider, toad and birds.

Let us answer. (Page 321)

1. What is ozone and how does it protect the organisms on earth?

Ans: **Ozone** is a deadly poisonous gas formed by three atoms of oxygen i.e. O_3 . It **filters harmful UV radiations (causing skin cancer) from reaching the surface of earth and acts as a protective shield.**

2. How can you help in improving the depleted ozone layer?

Ans: We can help in improving the **depleted ozone layer** by not using CFC or **reducing used of CFC** as refrigerant (a global initiative of UNEP to reduce level of CFCs by 50 %) and replacement of CFCs with substitute having less impact on ozone in the years to come.





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TEXTUAL EXERCISES

1. What are the impacts caused on the environment by the biodegradable and non-biodegradable wastes that we generate?

Ans: Such wastes bring about changes in the environment, affecting us causing great environmental problem or **pollution (any undesirable change in physical, chemical and biological characteristics of our environment)** and above all, our activities **degrade natural resources and deplete ozone layer.**

2. How can you handle the problem of solid waste in Manipur?

Ans: **The problem of solid waste in Manipur can be handled in the following ways:**

- a) Increasing facilities for effective collection of wastes.
- b) Disposing waste in specific landfill site in a scientific manner.
- c) Reduction of source, checking dumping of waste in Naga, Nambul river and Lamphel area etc.

3. What are the causes and effects of ozone layer depletion?

Ans: **The depletion of ozone** is caused by a number of synthetic chemicals like **CFCs**. It allows **harmful UV rays** to reach the part of Earth leading to sunburn, ageing, wrinkling of skin, cataract of eye, destruction of protein, mutation of genes leading to **skin cancer** or melanoma etc. in human beings.

4. Explain the role of decomposers in an ecosystem.

Ans: **Decomposers** are the agents of decomposition. It plays a very important role in cycling of nutrients by converting dead bodies of organisms (**plants and animals**) into organic and inorganic substances and thus provides nutrients to the plants and **detritivores like Earthworms**. They also **make soil fertile** and have become an integral part of our ecosystem.

5. Can you imagine, what will happen if all the insects are eliminated from our environment?

Ans: If we kill all the insects, the transfer of energy to their predators will be stopped, the availability of food to the insect eating population will be greatly reduced subsequently it leading to **ecological imbalance.**



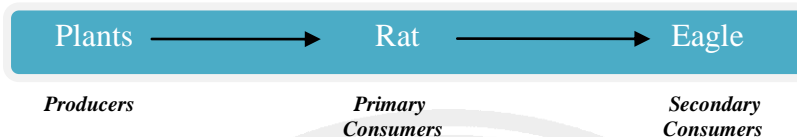
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6. Draw and level a food chain system showing interrelationship among the producers, primary consumers and secondary consumers.

Ans:



1. **Producers** represent the first trophic level.
2. **Herbivores or consumers** of the first order constitute the second trophic level (**primary consumers**).
3. **Consumers** of second order or carnivores form the third trophic level (**secondary consumers**).

EXTRA QUESTIONS & ANSWERS

1. What is an ecosystem?

Ans: The interacting organisms in an area together with the non-living components of the environment are called an **ecosystem**.

2. Define trophic level.

Ans: The various steps or levels through which the food energy passes are **trophic level**.

3. Why are men regarded as Omnivores?

Ans: Because men consume both plants and animals as food.

4. Construct a pyramid of energy of an ecosystem consisting of four trophic levels.

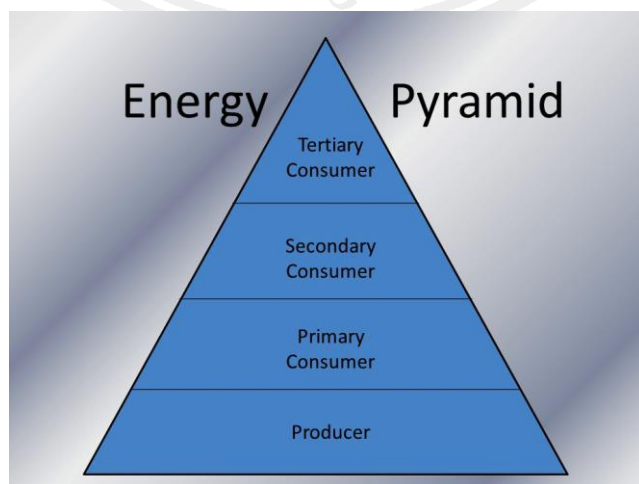


Fig. A pyramid of energy of an ecosystem (**always upright**) consisting of four trophic levels



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5. Describe the various components of an ecosystem.

Ans: An ecosystem has two components namely **biotic** and **abiotic** components. The biotic components include microorganisms, plants and animals including human being while the abiotic components include physical factors such as temperature, rainfall, wind, soil, minerals etc.

6. Give the names of any three natural ecosystems.

Ans: Forest, Desert, Pond

7. What is Ozone Shield?

Ans: Ozone present in the stratosphere filters away the UV rays and protects the earth from its harmful effects and known as **ozone shield**.

8. Differentiate between biodegradable and non-biodegradable waste.

Ans: The **differences** between biodegradable and non-biodegradable waste are given below:

| Biodegradable Wastes | Non-biodegradable wastes |
|---|---|
| 1. They are natural in origin. | 1. They are commonly man made. |
| 2. They can be easily broken down into harmless product by microorganisms. | 2. They cannot be broken down into harmless product by microorganisms (but can be degraded by heat and pressure). |
| 3. They do not accumulate in nature. | 3. They accumulate in nature. |
| 4. Such wastes can be converted into resources, increase fertility of the soil. | 4. Such wastes can't be recycled, create environmental problem. |

9. Define food Chain.

Ans: The transfer of food energy from one population to another is known as **food chain**.

10. Which organism constitutes the first trophic level?

Ans: Green plants or producers constitute the first trophic level.

11. State the roles played by insects. Give two points.

- Insects are pollinators and also help in dispersal of spores.
- They are prey for many other organisms. Above all insect larvae are also used as food.

12. Write the definition of trophic levels.

Ans: The various steps through which food energy passes in a food chain are known as **trophic levels**.



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13. State two benefits of **zero garbage campaign** at the capital city of Manipur.

a) Reduces air pollution.

b) Help to keep the city neat and clean, thereby reduces the impact of garbage in our environment.

14. If all of the ozone of the outer atmosphere is depleted, what will be the consequences?

Ans:

a) **Harmful UV radiations** will reach the surface of the Earth.

b) Sunburn, ageing, wrinkling of skin, cataract of eye, destruction of protein, mutation of genes leading to **skin cancer** or melanoma etc. occurs in human beings.

15. Construct one possible reason for inadequate facility for effective collection and disposable of solid waste from Imphal city.

Ans: Lack of specific landfill site for disposal of solid waste from Imphal city.

16. Why are insects regarded as necessary evils? Give two points.

Ans: **Insects** are very important in our ecosystem, perform pollination, help in dispersal of spores, and give us honey. Moreover insect larvae are used as food, also have medicinal values. In spite of all these useful roles play by insects, some other insects are harmful to our crops while others are vector for malaria and many other killer diseases. Therefore insects are regarded as necessary evils.

17. Suggest one reason for passing Environment Protection Act by the Govt. of India.

Ans: The Government of India has passed the **Environment Protection Act, 1986** as a measure **to protect and improve the quality of our environment**.

18. What is sewage?

Ans: **Sewage** is the liquid form of waste.

19. Name any two materials that remain unchanged over long period of time in our environment.

Ans: **Plastic and Glass**

20. Suggest any two important roles of enzymes.

Ans:

a) Digestion of food

b) Degradation of waste materials system.



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21. Can you name a very big ecosystem?

Ans: **Our Earth** is also a big ecosystem.

22. Mention two examples of artificial ecosystem?

Ans: Gardens and Crop- fields.

23. What are affected by non-living component of an ecosystem?

Ans: The growth, reproduction and other biological activities of the living component are affected by the non-living components.

24. Define the followings: Herbivores and Carnivores.

Ans:

Animals that feed on plants (plant tissue) are known as **herbivores. e.g. cow, sheep**

Animals that feed on herbivores are known as **carnivores. e.g. cat, eagle**

25. Is there any plant in the consumer level?

Ans: Yes, **insectivorous plants** can be considered as consumer while feeding on insects for nitrogen supply.

26. What will be the consequences if all decomposers are absent in an ecosystem?

Ans: The process of decomposition will stop, **recycling of materials in an ecosystem will not occur, plants fail to obtain nutrients from the soil.** Thus our environment will be filled with garbage, dead organisms etc.

27. Suggest one measure being taken up by UNEP to limit depletion of ozone.

Ans: In 1987, **UNEP (United Nations Environment Programme)** succeeded in arriving at an agreement to **reduce the level of CFCs** to 50% by 1999.

28. Mention any two ways in which non-biodegradable waste would affect the environment.

Ans:

a) **Pesticides** and several non-biodegradable chemicals enter our body through food chain and causes harmful effect.

b) **Recycling of plastic, polythene** releases toxic gases; **CFCs** causes ozone depletion.

29. The problem of waste disposal is a global issue. Can you suggest two methods that will help in reducing this problem?

Ans:

a) **Separating biodegradable and non-biodegradable waste;** then dumping biodegradable waste into specific landfill site or convert them into manure.

b) **Non-biodegradable wastes are destroyed by heat and pressure in controlled areas.**



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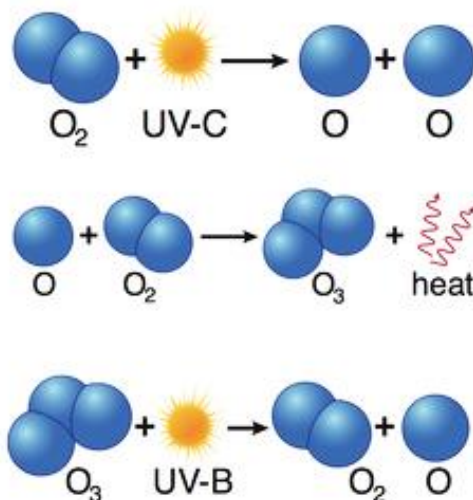
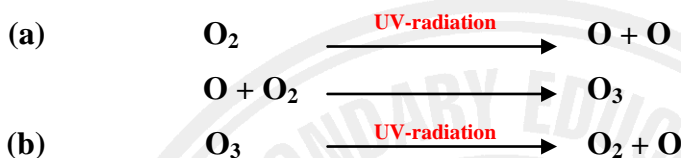
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30. If an organism says “R” feeds on seed eating bird. Can you identify the trophic level?

Ans: “R” occupies the third trophic level or secondary consumer.

31. Describe the process of formation and destruction of ozone?

Ans: **Ozone** is formed by three atoms of oxygen (O_3), being unstable it splits into O and O_2 by absorbing UV radiation. Then oxygen atom again combines with O_2 to form ozone. The formation of ozone also requires UV energy and the reaction involved are as follows:



Thus, the formation and destruction of ozone is a continuous process that requires UV energy.

32. Mention two sources of CFCs.

Ans: **Refrigerator and Fire-Extinguisher**

33. Ozone is a deadly poisonous gas. Why should we protect this poisonous gas from depletion at the higher level of atmosphere? Give one possible reason.

Ans: **Ozone present in the stratosphere filters away the ultraviolet radiation from sun and protects the earth from its harmful effect.**

34. What is the impact of ever increasing population on our environment?

Ans: There has been **increase in demand** for food, water, shelter, electricity, roads, automobiles and numerous other commodities. These demands exert a **tremendous pressure on our natural resources** and bring about undesirable changes in physical, chemical and biological characteristic in our environment.



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35. List the differences between herbivorous and carnivorous animals

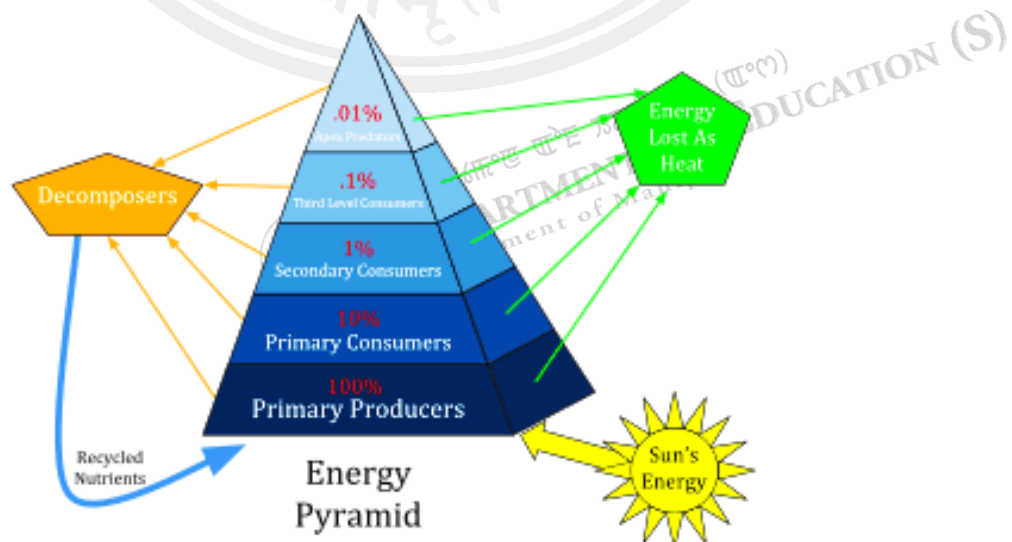
Ans:

| DIFFERENCES | |
|---|--|
| HERBIVOROUS | CARNIVOROUS |
| 1. They feed on plant tissue. | 1. They feed on animal tissue. |
| 2. They occupy 2 nd trophic level. | 2. They may occupy 3 rd or 4 th trophic level. |
| 3. Take longer time for digestion and absorption. | 3. Take comparatively less time for digestion and absorption. |
| 4. Very high chewing capacity. | 4. Do not chew. |
| 5. Example: Deer, Cow, Squirrel | 5. Example: Cat, Eagle, Fox |

36. What is Rule of 10s in Energy pyramid?

Ans: In the pyramid of energy, the amount of available energy decreases because organisms in each trophic level use the energy for life processes (movement, growth, reproduction) and the energy is released as heat from the body. This is the **(RULE OF 10s)** only about 10% of the energy at any given level is transferred to the next.

The energy of pyramid is always upright.



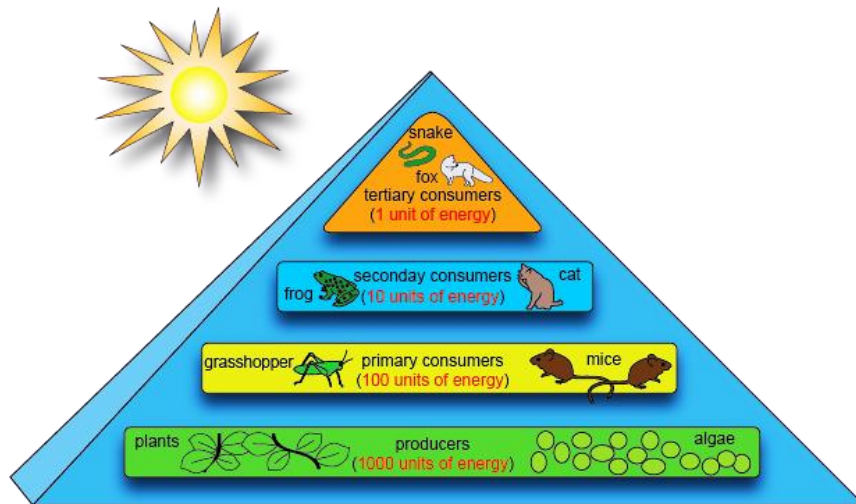


Fig. Diagram showing energy of pyramid

