

QUESTION BANK IN SCIENCE CLASS-X (TERM-II)

15

OUR ENVIRONMENT

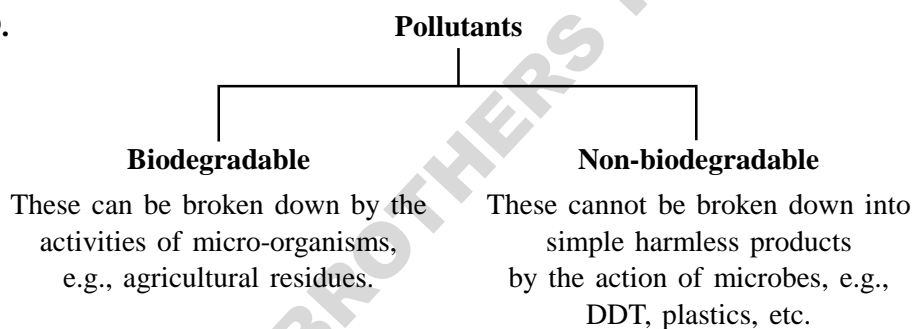
CONCEPTS

1. All the organisms such as plants, animals, micro-organisms and human beings as well as the physical surroundings interact with each other and maintain a balance in nature.
2. All the interacting organisms in an area together with the non-living constituents of the environment form an ecosystem.
3. An ecosystem consists of biotic components comprising of living organisms and abiotic components comprising of physical factors like temperature, rainfall, wind, soil and minerals.
4. The term 'environment' refers to the complete range of physical and biological conditions in which organisms live.
5. An environment has four components — atmosphere, hydrosphere, lithosphere and biosphere.
6. Environmental biology, also called ecology, is the study of relationships between living things and the non-living components.
7. An ecosystem is a self-sustaining, structural and functional unit of biosphere.
8. An ecosystem is an open system in terms of energy and a closed system as far as flow of minerals is concerned.
9. The small plants floating on the surface of water are phytoplanktons.
10. A pond, lake, river, forest, desert, even a man-made aquarium and a crop field are examples of ecosystems.
11. **Producers** or autotrophs synthesise their food by photosynthesis.
12. **Consumers** or heterotrophs are dependent upon other organisms for food.
13. Consumers may be classified as herbivores, carnivores, omnivores and parasites.
14. **Decomposers** or **saprophytes** consume and thus decompose, the dead remains of other organisms (both autotrophs and heterotrophs).
15. The sequential process of eating and being eaten is called a **food chain**.
16. The flow of energy in a food chain is unidirectional.
17. A simple food chain operating in a grassland can be shown as follows :

Grass → Deer → Lion.
18. The network of interconnected food chains is called a food web.
19. The various links or steps representing organisms in a food chain at which the transfer of food (and energy) takes place are called trophic levels.

20. There is a continuous transfer of energy from one trophic level to the next in a food chain.
21. Only 10 per cent of the total energy entering a particular trophic level is available for transferring to the next trophic level.
22. **Biomagnification** is the increase in harmful chemicals throughout the trophic levels.
23. The sum total of all the factors that make our surroundings is called the environment. Human activities have damaged the balance of this environment leading to problems like global warming, soil erosion, floods, etc.
24. The environmental problems are pollution, soil erosion, deforestation, thinning of ozone layer, global warming, depletion of natural resources, extinction of plant and animal species, formation of salt deserts, waste accumulation, etc.
25. Ozone is a molecule consisting of three atoms of oxygen.
26. Ultraviolet rays are known to cause skin cancer, eye damage and damage to the immune system.
27. There are several reasons for the depletion of ozone layer. The foremost is the use of chlorofluorocarbons (CFCs).
28. Municipal Solid Wastes (MSWs) are commonly called garbage.

29.



30. Main sources of non-biodegradable wastes are improved packaging methods and increased use of disposals. Biodegradable products work as pollutants only when in excess.
31. **Ecofriendly ways of waste disposal** —
- Most urban solid wastes can be burnt to make land fills.
 - Wastes like plastics, metals, etc., may be recycled.
 - Plastic wastes may be molten and mixed with asphalt to produce road making material.
 - Many domestic wastes like vegetable refuse can be composted and effectively used as manure.
 - Incineration, i.e., burning at a high temperature is recommended for many non-reutilisable waste.

I. SUMMATIVE ASSESSMENT

NCERT QUESTIONS WITH THEIR ANSWERS

SECTION A : IN-TEXT QUESTIONS

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

Ans. Substances which are broken down by enzymes of saprophytes over a period of time are called **biodegradable**. Garbage, sewage, livestock waste, agriculture waste, etc. are biodegradable.

The substances which cannot be broken down by enzymes of saprophytes over a period of time are called **non-biodegradable**. Waste plastic, polythene articles, etc. are non-biodegradable.

2. Give any two ways in which biodegradable substances would affect the environment.

Ans. (i) The huge amount of biodegradable produce foul gases and pollute the environment.
(ii) A number of pathogens and pests breed in such places and spread the diseases.

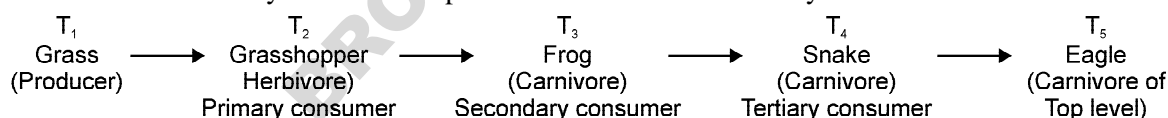
3. Give any two ways in which non-biodegradable substances would affect the environment.

Ans. (i) Non-biodegradable clog the sewage system and pollute the soil.
(ii) Some of the non-biodegradable substances may be toxic for the humans and produce various diseases.

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1. What are trophic levels? Give an example of a food chain and state the different trophic levels in it.

Ans. Each step or functional level occupied by an organism in a food chain is called a trophic level. A food chain may have 3–5 trophic levels in a terrestrial ecosystem.



2. What is the role of decomposers in the ecosystem?

[2011 (T-II)]

Ans. The decomposers bacteria and fungi secrete enzymes over the organic remains. It causes breakdown of organic remains into simpler and soluble substances that are absorbed by saprophytes. They clean the earth from organic matter hence they are also known as natural scavengers.

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1. What is ozone and how does it affect any ecosystem?

OR

What is ozone? How does it protect the organisms on the Earth?

Ans. Ozone is a molecule of three atoms of oxygen (O_3) while the oxygen we breathe in is made up of two atoms (O_2). Ozone lies above the troposphere and extends between 8 – 50 km in different regions. It performs a very important function as it shields the atmosphere and protects the earth from UV-radiation. The UV-radiation is very harmful or highly damaging and causes skin cancer in humans.

2. How can you help in reducing the problem of waste disposal? Give any two methods.

Ans. We can reduce the problem of waste disposal by adopting the following methods —

- (i) By recycling and minimising the use of non-biodegradable wastes.
- (ii) By producing useful products like biogas, compost, vermicompost, etc. from the biodegradable wastes.

SECTION B : QUESTIONS AT THE END OF THE CHAPTER

1. Which of the following groups contain only biodegradable items?

- (a) Grass, flowers and leather
- (b) Grass, wood and plastic
- (c) Fruit-peels, cake and lime-juice
- (d) Cake, wood and grass

Ans. (c) Fruit-peels, cake and lime-juice.

2. Which of the following constitute a food-chain?

- (a) Grass, wheat and mango
- (b) Grass, goat and human
- (c) Goat, cow and elephant
- (d) Grass, fish and goat

Ans. (b) Grass, goat and human.

3. Which of the following are environment-friendly practices?

- (a) Carrying cloth-bags to put purchases in while shopping.
- (b) Switching off unnecessary lights and fans.
- (c) Walking to school instead of getting your mother to drop you on her scooter.
- (d) All the above.

Ans. (d) All the above.

4. What will happen if we kill all the organisms in one trophic level?

Ans. If we kill all the organisms in one trophic level, the organisms of the next trophic level will decrease in number due to non-availability of food. On the other hand the organisms of lower trophic level will increase because no organism will be there to feed upon them. So the ecosystem of that area will disturb.

5. Will the impact of removing all the organisms in a trophic level be different for different trophic levels? Can the organisms of any trophic level be removed without causing any damage to the ecosystem?

Ans. Removal of all the organisms of a trophic level will affect the entire ecosystem of that area. Its impact on different trophic levels will be different because of the organisms of a trophic level are directly dependent on them while the organisms of other trophic level are indirectly depend on them for their food. For example, killing of herbivores will increase the number of carnivores and killing of carnivores will increase the number of herbivores. Most of the organisms will die of starvation.

6. What is biomagnification or biological magnification? Will the level of this magnification be different at different trophic levels?

Ans. Unknowingly some harmful chemicals enter our body through the food chain. These chemicals are either washed down into the soil and finally enter the water table or are taken up from

the soil by the plants along with water and minerals and thus enter the food chain. As these chemicals are not degradable, these harmful chemicals get connected at each trophic level. This is termed as biomagnification or biological magnification. The concentration increases in successive trophic levels.

7. What are the problems caused by the non-biodegradable wastes that we generate?

Ans. Non-biodegradable wastes create several environmental problems. As for example, poisonous chemicals like DDT and other pesticides remain as such in the biosphere for a long time. These enter the food chain where they get biomagnified at each trophic level and it causes harm in every trophic level. Non-biodegradable wastes create pollution which in turn creates different diseases among the organisms.

8. If all the waste we generate is biodegradable, will this have no impact on the environment?

Ans. As biodegradable wastes can be easily recycled, they do not create pollution. Thus, pollution related diseases will not result as well as our environment will be also safe. If it is not cleaned regularly there may be some harmful effects such as —

- (i) production of foul gases.
- (ii) ugly look of the environment, as the microbes will not be able to decompose such a huge amount of wastes regularly.

9. Why is damage to the ozone layer a cause of concern? What steps are being taken to limit this damage?

Ans. Ozone layer has become a cause of concern because depletion of ozone layer can cause serious effects on human body and other organisms of the environment like —

- (i) Cancer in human beings.
- (ii) Loss of immunity in humans.
- (iii) Destruction of aquatic life and vegetation.
- (iv) Temperature changes and rainfall failures.

Steps being taken to reduce it are :

- (i) by reducing the use of CFCs — Many countries have already banned the use of CFCs.
- (ii) by developing substitutes of CFCs — Scientists have already developed some substitutes which are ozone-friendly.

ADDITIONAL QUESTIONS (As Per CCE Pattern)

A. Very Short Answer Questions

[1 Mark]

Previous Years' Questions

1. Why are green plants called producers? [2009]

Ans. Green plants are called producers, because they can synthesise organic food from inorganic raw materials by trapping the solar energy in the process of photosynthesis. This food is used by green plants as well as all other organisms called consumers.

2. Which compounds are responsible for the depletion of ozone layer? [2009]

Ans. Ozone depleting substances like chlorofluorocarbons, hydrocarbon, N_2O , chlorine, etc. are responsible for the depletion of ozone layer.

3. What are two main components of our environment? [2009]
Ans. (a) **Biotic Components** (producers, herbivores, carnivores, decomposers.)
 (b) **Abiotic Components** (climatic factors, topographic factors, edaphic factors and inorganic nutrients).
4. Which disease is caused in human being due to depletion of ozone layer in the atmosphere? [2009]
Ans. Skin cancer.
5. Why is ozone layer getting depleted at higher levels of the atmosphere? [2008]
Ans. Due to the release of CFCs in the environment the ozone layer is getting depleted at higher levels of the atmosphere where low temperature favours the chemical reactions of depletion.
6. Name any two abiotic components of an environment. [2008]
Ans. (a) Climatic factors (light)
 (b) Edaphic factors (soil)

Other Important Questions

1. Define the term 'biome'. (V.Imp.)
Ans. Biome is a bigger unit than an ecosystem, of organisation and comprises all the ecosystems in a geographical area.
2. Name any two terrestrial ecosystems. (Imp.)
Ans. (a) Grassland, (b) Crop field
3. In what form, plants store the trapped solar energy?
Ans. Chemical energy.
4. How much energy is lost in transferring from one trophic level to other in a food chain? (V.Imp.)
Ans. 90%.
5. Name a natural ecosystem.
Ans. Pond ecosystem.
6. What are microconsumers?
Ans. The heterotrophs which are very small organisms like insects, zooplanktons, etc. are called microconsumers.
7. Define omnivores.
Ans. The animals which feed on both plants and animals are called omnivores. Examples — Human beings, cockroaches, crow, bear, cat, dog, ant, etc. (Imp.)
8. Write a three step food chain.
Ans. Plants (Producer) → Cow (Herbivore) → Lion (Carnivore)
9. What are top carnivores? (V.Imp.)
Ans. The organisms which occupy the top level or the highest trophic level of a food chain or food web are called top carnivores. Example — Tiger, lion, hawk, peacock, etc. are the top carnivores.

10. Define food web.

Ans. Food web is a network of interconnected food chains which provides a number of feeding connections amongst different organisms of a biotic community.

11. What is biomass? (Imp.)

Ans. The amount of organic matter present in an organism is called biomass.

12. Define biomagnification.

Ans. The increase in concentration of a chemical per unit weight of the organisms with successive rise in trophic level is called biomagnification.

13. Name the largest man-made ecosystem. (Imp.)

Ans. Aquarium.

14. What is composting?

Ans. Production of manure by decomposition of kitchen wastes and other biodegradable wastes is called composting.

15. Where is ozone layer located?

Ans. Ozone layer is located in the atmosphere as a part of stratosphere. (V.Imp.)

16. How does making of *kulhads* affect our environment?

Ans. Making a lakhs of *kulhads* daily may result in losses of fertile land and its top soil.

B. Short Answer Questions - I

[2 Marks]

Previous Years' Questions

1. Observe the food chain

Plant (1000 kJ) → Goat → Lion

(a) If autotrophs occupying the first trophic level are called producers what are herbivores called as?

(b) How much energy does the lion get in the above food chain? [2011 (T-II)]

Ans. (a) Herbivores occupying the second trophic level are called consumers.

(b) Plant → Goat → Lion
(1000 kJ) (100 kJ) (10 kJ)

The lion gets 10 kJ energy in the above food chain.

2. With the help of an example show that 'reuse' strategy is better than 'recycling'. [2010]

Ans. The plastic cans can be reused instead of recycling them. Reusing any waste does not require energy and no pollution is produced. While a lot of energy is required to melt the plastic cans then make them some other usable items.

Many harmful gases are also released during recycling a plastic waste.

3. Construct an aquatic food chain showing four trophic levels. [2010]

Ans. Aquatic Food Chain

Phytoplanktons → Zooplanktons → Small fish → Big fish
(Producers) (Herbivores) (Carnivore) (Carnivore)

4. What are biodegradable and non-biodegradable substances? Select two biodegradable pollutants from the following :

Agricultural waste, glass, plastic, sewage, DDT.

[2009]

Ans. Biodegradable substances : The substances which can be degraded or decomposed by the bacteria and fungi are called biodegradable substances.

Non-biodegradable substances : The substances which cannot be decomposed by bacteria and fungi are called non-biodegradable substances.

Agricultural waste and sewage are the biodegradable pollutants.

5. State two problems caused by the non-biodegradable waste that we generate in our daily life.

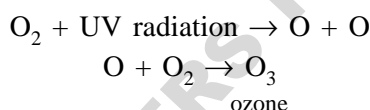
[2009]

Ans. (i) Non-biodegradable waste clogs the sewage system and pollutes the soil.
(ii) Some of the non-biodegradable substances may be toxic for humans and produce various diseases.

6. How is ozone formed in the upper atmosphere? Which compounds are responsible for the depletion of the ozone layer?

[2008]

Ans. The ozone layer occurs naturally in the stratosphere. The ozone layer is formed when intense UV radiation from the sun reacts with ordinary molecules of oxygen (O_2) in the stratosphere to dissociate into single oxygen atoms (O). Single oxygen atoms are very reactive; they combine with O_2 to form O_3 .



The CFCs (chlorofluorocarbons), halons, nitrous oxide, methane, carbon tetrachloride and chlorine are responsible for the depletion of the ozone layer.

Other Important Questions

1. What are the advantages of using disposable paper cups over disposable plastic cups? (V.Imp.)

Ans. The use of disposable paper cups has the following advantages over plastic cups :

- (i) Paper cups are biodegradable. Therefore, they are decomposed automatically by the action of micro-organisms in due course of time. On the other hand, plastic cups are non-biodegradable. They will remain as such and pollute the environment.
(ii) Paper cups can even be disposed off by burning without causing much air pollution. On the other hand, burning of plastic cups produces toxic gases which cause air pollution.

2. Give examples of a grassland and a pond food chain.

Ans. Grassland food chain :

Grass \rightarrow Deer \rightarrow Lion

Grass \rightarrow Insects \rightarrow Frogs \rightarrow Birds

Pond food chain :

Phytoplanktons \rightarrow Zooplanktons \rightarrow Small fish \rightarrow Big Fish

3. How does a food web an important factor of our environment? Describe its four benefits.

(Imp.)

Ans. Importance of food web

- (i) **Starvation :** Food web does not allow any population to starve when members of lower trophic level decrease in number.

- (ii) **Checking Overpopulation** : Food web does not allow a species to overgrow as increased availability will increase the chance of higher number of its predations.
- (iii) **Endangered Population** : It allows endangered population to grow in size.
- (iv) **Stability** : Food webs provide stability to ecosystems.

4. Give two advantages of cloth bags over plastic bags. (Imp.)

Ans. Advantages of cloth bags :

- (i) Cloth bags are more durable and can be used again and again (reused).
- (ii) They are made of biodegradable material so do not pollute the environment on disposal.

5. What is the role of decomposers in the environment? (V.Imp.)

Ans. Decomposers are saprophytes (bacteria and fungi) which feed on organic remains by a process of external digestion and absorption of solubilised materials. In this process they perform the following functions :

- (i) Cleansing the earth of organic remains and creating space for newer generations of organisms.
- (ii) Release of minerals from organic remains. The released minerals become available to plants for utilisation in synthesis of new organic matter. Decomposers, therefore, take part in bio-geochemical recycling.

6. Why do we need to clean an aquarium but not a pond?

Ans. An aquarium is an artificial system which is also incomplete due to absence of producers, food chains and decomposers. There is no recycling and self cleaning. However, a pond or a lake is a self sustained, natural and complete ecosystem where there is perfect recycling of nutrients.

7. What will be the consequences of the absence of decomposers in an ecosystem?

Ans. The absence of decomposers will cause —

- (i) Piling up of litter, excretions, dead bodies of animals and plants. There will be no free space for new organisms.
- (ii) The biogenetic nutrients will be tied up in organic matter.

8. Give four important reasons for excess waste generations.

Ans. (i) Increasing tendency to use disposable plates, spoons, cups and water containers.

(ii) A lot of leftover food is generated.

(iii) A number of reusable things are also disposed as wastes.

(iv) No separation of biodegradable waste from non-biodegradable substances.

9. Give two international efforts to check ozone depletion. (Imp.)

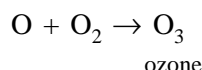
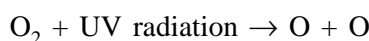
Ans. (i) **Montreal Protocol** (1987), United Nations Environment Programme succeed in forging an agreement between industrialised nations to limit the production of CFCs to half the level of 1986.

(ii) **Helsinki Declaration** (1989), most nations pledged to phase out CFCs and halons by 2000.

C. Short Answer Questions - II**[3 Marks]****Previous Year's Questions**

1. How is ozone formed in the upper atmosphere? Why is the damage of ozone layer a cause of concern to us? State cause of this damage. **[2008, 2009]**

Ans. The ozone layer occurs naturally in the stratosphere. The ozone layer is formed when intense UV radiation from the sun causes ordinary molecules of oxygen (O₂) in the stratosphere to dissociate into single oxygen atoms (O). Single oxygen atoms are very reactive and combine with O₂ to form O₃.



Ozone layer has become a cause of concern because depletion of ozone layer can cause serious effects on human body and other organisms of the environment like eye damage, skin damage, cancer, etc.

CFCs, nitrous oxide, methane, chlorine, halons, etc., are responsible for the damage of ozone layer.

2. Why are some substances biodegradable and some non-biodegradable? **[2008]**

Ans. Substances which can be degraded and disposed off naturally by saprophytic organisms or decomposers are called **biodegradable**, e.g., organic remains, garbage, sewage, livestock waste, etc. Substances which cannot be degraded by decomposers are known as **non-biodegradable**. They are man-made articles like pesticides, polythene, plastic, synthetic fibres, etc. Biodegradable articles are formed naturally in biosphere. Decomposers feed on them by secreting digestive juices and absorb the soluble substances. Non-biodegradable articles pile up in nature because decomposers do not have enzymes or digestive juices to degrade them.

3. "Damage to the ozone layer is a cause of concern." Justify the statement. Suggest any two steps to limit this damage. **[2008]**

Ans. Ozone layer present in the stratosphere has thinned out by about 8% over the equator and more so over the Antarctica where a big ozone hole (very thin layer) appears every year. This has increased the level of UV radiations reaching the earth. These radiations are causing increased number of skin cancers, eye diseases and reduced immunity in human beings. There is increased incidence of blinding of animals, death of young ones, reduced photosynthesis, higher number of mutations, etc.

Steps to Limit Damage. (i) Ban on production and use of CFCs.

(ii) Ban on production and use of other ozone depleting gases.

4. Distinguish between biodegradable and non-biodegradable substances. List two effects of each of them in our environment. **[2008]**

Ans.	Biodegradable Pollutants	Non-biodegradable Pollutants
	<ol style="list-style-type: none"> 1. They are biological in origin. 2. The wastes are degraded by micro-organisms. 3. They do not accumulate in nature. 4. The biodegradable wastes do not show biomagnification 5. The wastes can be converted into resource. <p>Examples : Garbage, kitchen wastes, sewage.</p>	<ol style="list-style-type: none"> 1. They are commonly man-made. 2. They are not degraded by micro-organisms. 3. They pile up and accumulate in nature. 4. The soluble non-degradable wastes enter food chains and undergo biomagnification. 5. Some wastes can be recycled. <p>Examples : Plastic, polythene, glass, metallic cans, etc.</p>

Effects of biodegradable substances on our environment :

- (i) They can be easily recycled, hence they do not create pollution.
- (ii) The degradation of agricultural waste helps in reducing the use of fertilisers in place of manures.

Effects of non-biodegradable substances on our environment :

- (i) Depletion of ozone layer
- (ii) Pollution, created by non-biodegradable substances cause different diseases among the living organisms.

5. What is biodegradable substances? Describe two ways in which non-biodegradable substances affect our environment. [2008]

Ans. Biodegradable substances : The substances which can be degrade or decomposed by the bacteria and fungi are called biodegradable substances.

Non-biodegradable substances : The substances which cannot be decomposed by bacteria and fungi are called non-biodegradable substances.

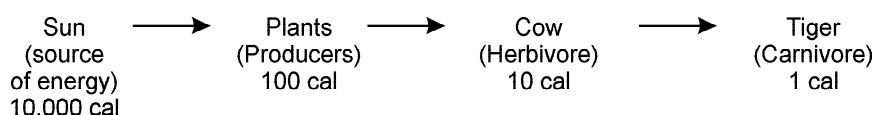
The non-biodegradable substances affect our environment as :

- (i) Non-biodegradable substances chock the sewage system and pollute the soil.
- (ii) Some of the non-biodegradable substances may toxic for the humans and produce various diseases.

Other Important Questions

1. The flow of energy in an ecosystem is unidirectional. Justify. (Imp.)

Ans. The green plants of an ecosystem receive the energy from sun and change it into chemical form. This energy is transferred from plants to herbivores and then to the next trophic level.



Since energy available decreases at every trophic level, very little of it is available at higher trophic levels. There is a loss of energy at every step of its transfer. Hence, it cannot flow in the reverse direction and is called unidirectional flow.

2. Suggest any five activities in our daily life which are ecofriendly.

Ans. We can follow some ecofriendly activities in our daily life. These are :

- (i) Cloth bags should be used in place of plastic bags or polythenes.
- (ii) Domestic wastes and kitchen wastes can be made use of as manures or compost for plants.
- (iii) We should reduce the wastage of foods, water, or any other thing.
- (iv) We should not use the electronic equipments using the ozone depleting gases or chemicals.
- (v) From biodegradable waste, biogas can be prepared which costs much less than other fuels.
- (vi) Separation of biodegradable and non-biodegradable wastes of our house.

3. If all the wastes we generate is biodegradable, will this have any impact on the environment? **(V.Imp.)**

Ans. If all the waste we generate is biodegradable there will not be any crucial impact on the environment, but it will depend on the system of waste management. If the workers collect the waste generated, everyday and transport it to the disposal site, the problem of foul gases and increasing pathogens can be avoided. It can be done by the use of machines and wearing of protective gear (dress) by the sanitary workers.

4. “The improper disposal of wastes is a curse to environment” Justify the statement.

Ans. The improper disposal of wastes results in addition of pollutants to the environment i.e. air, soil and water. It will harm all the living beings including plants, animals and humans. For example, the passage of sewage into water body will cause development of sludge, eutrophication, killing of aquatic animals and growth of human disease causing pathogens.

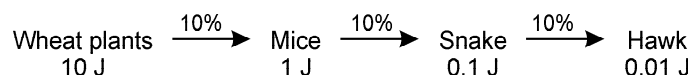
5. What is the difference in the food habits of organisms belonging to the first and third trophic levels of a food chain? Give one example each of the organisms belonging to these two trophic levels.

Ans. (i) The organisms belonging to the first trophic level are green plants (producers). They make their food by photosynthesis. Plants occupy the first trophic level.

(ii) The organisms belonging to the third trophic level are carnivores. They get their food from herbivores (who eat plants). Lion, tiger, hawk, etc. are at the third trophic level.

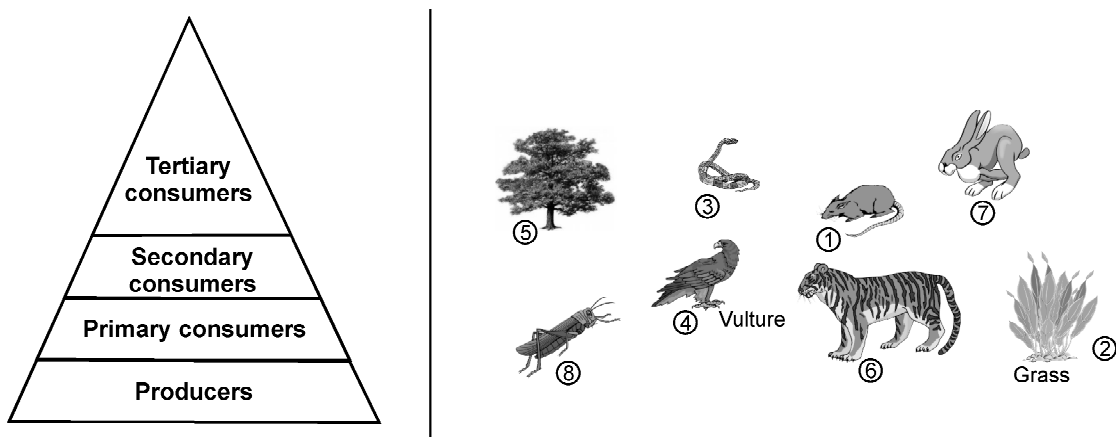
6. How much energy will be available to hawks in the food chain comprising hawk, snake, paddy and mice, if 1,000 J of energy is available to wheat plants from the sun? **(Imp.)**

Ans. Wheat plants represent the producer level. They trap only 1% of the sun's energy falling on them. So, the energy available in wheat will be 1% of 1,000 J which will be 10 J. We can now show the food chain and apply ten per cent law to it.

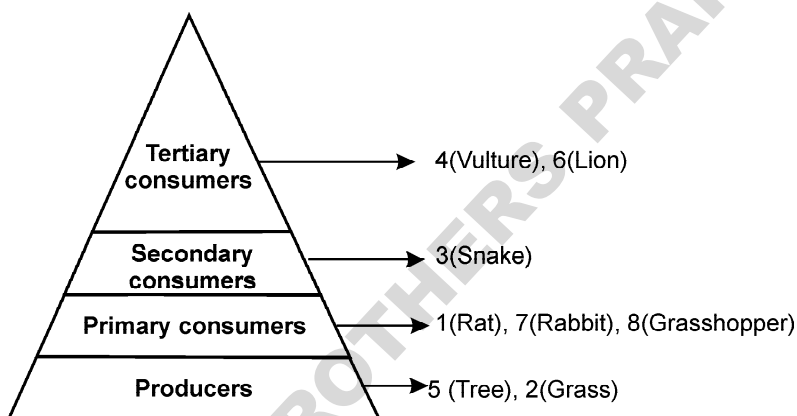


Thus, the energy available to the hawk will be 0.01 J.

7. Write the number given to any six of the organisms shown in figure given below, against their relevant Trophic levels.



Ans.



8. What are phytoplanktons and zoo-planktons? Give one example of each. **(Imp.)**

Ans. (i) The microscopic aquatic plants freely floating on the surface of water are called phytoplanktons. Phytoplanktons are capable of producing food by photosynthesis. The free floating algae are the example of phytoplanktons.

(ii) The microscopic aquatic animals, freely floating on water are called zooplanktons. The freely-floating protozoa are an example of zooplankton.

D. Long Answer Questions

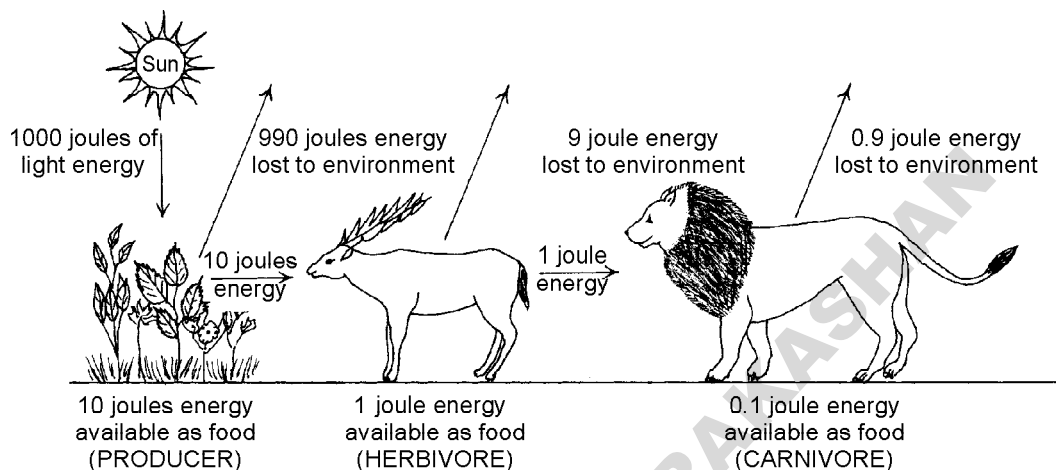
[5 Marks]

Other Important Questions

1. Why is maximum energy available at the producer level? **(Imp.)**

Ans. There is a continuous transfer of energy from one trophic level to the next in a food chain. At each trophic level a part of the energy is utilised by the organisms for their own metabolic activities and growth. At each trophic level some energy is also lost as heat which remains unutilised. This is called ten per cent law.

Since, there is a loss of energy as heat at each trophic level, the amount of energy available at each successive level goes on decreasing. Thus, the energy available is maximum at the producer level.



2. Name the wastes which are generated in your house daily. Give the measures you should take for their disposal. (V.Imp.)

Ans. Waste Materials generated daily in homes :

- Vegetable and fruit peels, stale food, food leftovers, used tea leaves, etc.
- Milk pouches, polythene bags, empty cartons, plastic and metallic cans.
- Waste newspapers, paper bags, paper envelopes, packing paper, empty bottles, cotton cloth pieces, etc.
- Dust and other sweepings.

Measures for Disposal of Wastes :

- Separation into different categories as — biodegradable and non-biodegradable, recyclable and non-recyclable wastes.
- Recyclable wastes i.e. waste paper, cloth, polythene or plastic bags, cartons, bottles, cans, etc. can be given to rag pickers for recycling.
- Preparation of compost or vermicompost from kitchen wastes for kitchen garden.
- The household garbage and other wastes can also be given to waste collectors for disposal.

3. What is an ecosystem? Describe briefly the components of an ecosystem.

Ans. An ecosystem is a distinctive and stable ecological unit in an area and consists of the following features :

- Different populations of organisms living and interacting together within a community.
- All abiotic factors of the environment.
- The energy flow through food-chains and webs.
- The cycling of nutrients to be re-used by the community.

An ecosystem consists of two main components :

- (a) **Non-living or abiotic component** and
- (b) **Living or biotic component.**

Abiotic Component : Abiotic component includes

- (i) Physical environment (like soil, water and air).
- (ii) Inorganic substances or nutrients (such as carbon dioxide, oxygen, nitrogen, water and all the minerals).
- (iii) Climatic factors such as temperature, light, humidity, wind and atmospheric pressure.

Living components or the **biotic components** : It is the community of various organisms, plants, animals and microbes, comprising many different interdependent populations.

Depending upon their mode of nutrition, the biotic components of an ecosystem are primarily made up of three kinds of organisms — **producers** (autotrophs), **consumers** (heterotrophs) and **decomposers**.

4. Why are bacteria and fungi called decomposers? List any two advantages of decomposers to the environment. **(Imp.)**

Ans. The living organisms which decompose or consume the dead remains of other organisms are called decomposers.

Certain bacteria and fungi break down the complex organic compounds present in the dead organisms into simpler substances. So they are called decomposers.

Advantages of decomposers :

- (i) By decomposing the dead organisms, the decomposers clean the environment.
- (ii) After decomposing the dead organism the decomposed elements enter the soil, this maintains its fertility.

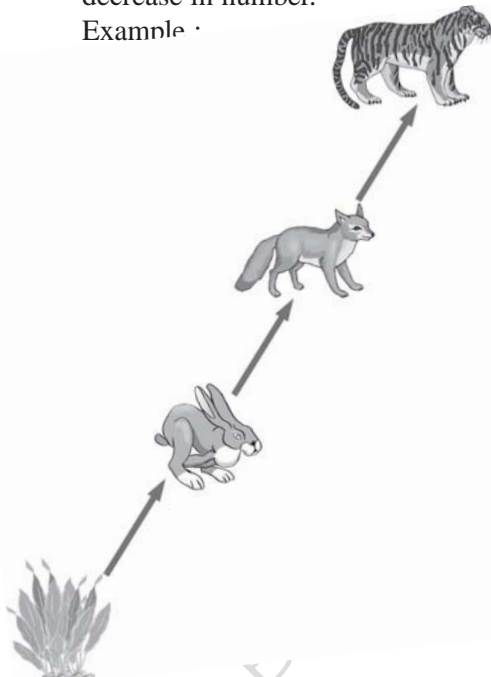
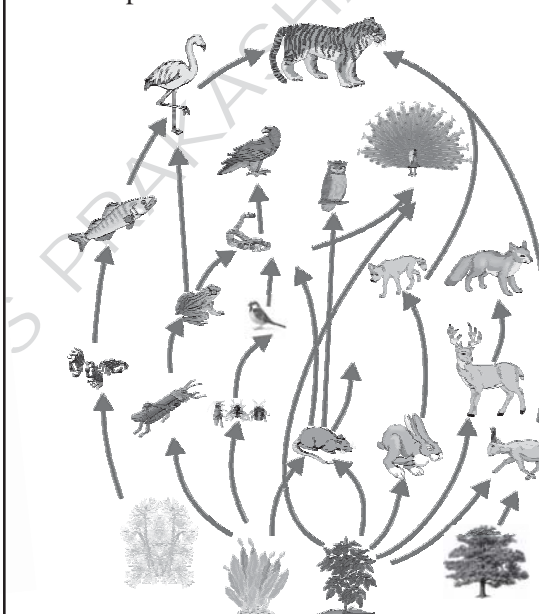
5. How do human activities affect the environment?

Ans. Humans through their dominating influence have changed the environment drastically in the following ways :

- (i) They are misusing the natural resources for their own sake.
- (ii) Population explosion is related with the need for rapid development. As a result, random exploitation of environmental resources is occurring.
- (iii) The air we breathe and the water we drink is getting polluted, rains are becoming erratic, forests are getting depleted and a large number of plants and animal species are disappearing.
- (iv) The topsoil is getting eroded and the ozone layer is getting depleted. This environmental degradation threatens the very existence of human beings. The tragedy is that these problems are being created by human beings themselves.

6. Differentiate between food chain and food web. Give suitable examples of each. Explain how harmful chemicals enter our bodies?

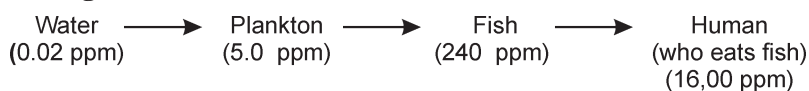
Ans.

Food chain	Food web
<ol style="list-style-type: none"> Food chain consists of a single series of food relations. It has a maximum 4-6 trophic levels of different species. Each organism uses a particular type of food. Starvation is observed whenever the members of lower trophic level decrease in number. <p>Example :</p> 	<ol style="list-style-type: none"> Food web is a complex network of several series of food chains or food relations. It has a number of trophic levels or populations of different species. Each organism can use different types of food. Food webs do not allow starvation and help in increasing the population of endangered species. <p>Example :</p> 

7. What is biological magnification? Explain the process of biological magnification.

Ans. Biological Magnification : The phenomenon through which the concentration of pollutants or toxic chemicals increases with increasing trophic level in a food chain is called **biological magnification**.

Biological Magnification :



For example : The non-biodegradable pollutants i.e., DDT once absorbed by an organism cannot be metabolised and broken down or excreted out.

- DDT, is a pesticide which is sprayed on water bodies to check the growth of mosquitoes but sometimes it happens that it enters the food chain.
- The concentration of DDT increased in phytoplankton relative to the concentration in water.

- (iii) Zooplanktons contain more DDT than phytoplanktons.
- (iv) The concentration of DDT increases in those different fishes which consume the zooplanktons.
- (v) The concentration again increases in those animals which consume the fishes, like human beings. As human beings occupy the top level in any food chain, the maximum concentration of harmful chemicals gets accumulated in the human body.

II. FORMATIVE ASSESSMENT

A. Activity

Aim: To separate biodegradable and non-biodegradable wastes.

Materials Required: A pot, old newspapers, toffee wrappers, fruit peels, aluminium cans, broken glass pieces.

Procedure:

1. Take some old newspapers, toffee wrappers, fruit peels, aluminium cans and broken glass pieces.
2. Put these items in a container.
3. Fill the container with soil and make the soil moist with water.
4. Label each container and bury each container in pits made in the soil.
5. Leave the container for about three weeks.
6. After three weeks, take out the container and note down the changes in the items which were kept in each container. See which items have rotted.

Observation: Record your observation in the following table.

S.No.	Item	Rotted completely	Partially rotted	No change at all
1				
2				
3				
4				
5				
6				

On the basis of above information, classify the items as

- (i) biodegradable and (ii) non-biodegradable.

B. Quiz

1. There is a gradual decline in the amount of energy available as we move from producer level to the next trophic levels. What is the reason behind this decline? Is the number of trophic levels in a food chain related to this decline? Give reason behind your answer.

Ans. There is a continuous transfer of energy from one trophic level to the next in a food chain. At each trophic level, a major part of the energy is utilised by the organisms for their own metabolic activities and growth. At each trophic level some energy is also lost as heat which remains unutilised. Hence, the amount of energy available at each successive level goes on decreasing.

Since very little energy is available at the level of consumers, food chains generally consists of only three or four steps.

2. DDT is a pesticide which is used in our fields for killing the pests but it is banned in most of the developed countries. What is the reason behind its banning?

Ans. DDT is not degradable. It get concentrated at each trophic level due to the process of biomagnification. DDT has been found to have maximum concentration in human being. Hence, it is banned in most developed countries.

C. Puzzles

1. Look across, up and down in the grid to find the answer of the following:

A	E	D	C	P	T	E	R	S	C
P	R	E	D	R	S	T	A	N	O
O	F	O	O	D	C	H	A	I	N
D	E	O	I	N	D	U	S	T	S
R	E	C	O	L	O	G	Y	I	U
I	S	N	I	D	T	R	G	O	M
E	M	O	N	T	W	R	E	A	E
P	R	O	D	U	C	E	R	S	R
A	G	R	E	M	C	E	B	D	S
D	E	C	O	M	P	O	S	E	R

- The organisms dependent on other organisms for food.
- Organism that decomposes, the dead remains of other organisms.
- The sequential process of eating and being eaten.
- The network of interconnected food chains.
- The study of relationships between living things and their non-living components.
- Organisms synthesise their own food by photosynthesis.

Ans. (i) CONSUMER (ii) DECOMPOSER (iii) FOOD CHAIN
(iv) FOOD WEB (v) ECOLOGY (vi) PRODUCER

2. Unscramble the following and write down the names of ten such wastes. Sort them as biodegradable and non-biodegradable wastes.

- PESRPWSAEN :
- CSITASPL :
- SASLG :
- GESEAW :
- OWOD :
- TEHNEYLOP :
- TOTONC :
- GUND :
- NIALS RION :
- TUIFR LPEE :

Ans. (i) NEWSPAPERS (ii) PLASTICS (iii) GLASS
(iv) SEWAGE (v) WOOD (vi) POLYTHENE
(vii) COTTON (viii) DUNG (ix) IRON NAILS
(x) FRUIT PEEL

D. Group Activities

1. Prepare an aquarium by using a big glass jar, water, oxygen pump (aerator), fish, water plants and fish food. Study the physical factors which need to be provided and controlled in an aquarium.
2. Prepare a list of waste materials produced in your home in a day. Categorise these wastes as biodegradable and non-biodegradable.

Compare this with the waste materials generated in your classroom and in your friend's home in a day. How much of this waste is biodegradable.

E. Seminar

1. **Topic**—Depletion of ozone layer

(**Hints**—Discuss the following points:

- | | |
|--------------------------|---------------------------------|
| (i) How is ozone formed? | (ii) Causes of ozone depletion. |
| (iii) Montreal Protocol. | (iv) Control measures. |

2. **Topic**—Importance of study of food chains

(**Hints**—Discuss the following points:

- | | |
|---|-----------------------------------|
| (i) Food chain | (ii) Flow of energy in food chain |
| (iii) Effect of chemical concentration in food chains.) | |

F. Debate

1. DDT, a commonly used pesticide, has been found to have maximum concentration in human beings.
2. Chlorofluorocarbons are responsible for ozone layer depletion.

G. Group Discussion

1. How do non-biodegradable wastes affect our environment?
2. The occurrence of pesticides in readymade food items.

H. Survey

A survey can be done on the waste disposed by your locality. Find out—

- (a) What amount of waste is disposed by each household?
- (b) Make a list of the biodegradable and non-biodegradable wastes disposed by each household.
- (c) What amount of waste is disposed by your locality each day?
- (d) What role does the resident welfare association and the municipal corporation play in dealing with the waste?

I. Project

To observe a pond ecosystem.

- What are the non-living components of this ecosystem?
- What are the living components of this ecosystem?
- Are the living organisms dependent on each other?
- Are the living organisms affected by the non-living components?