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Q.1. Give reason to justify the following

- (a) The existence of decomposers is essential in a biosphere.
(b) Flow of energy in food chain is unidirectional.

[CBSE 2016]

Ans. (a) The existence of decomposers is essential in a biosphere because they breakdown complex organic substances into simple inorganic substances that can be absorbed by the plants. Thus, decomposers

(i) replenish the soil naturally.

(ii) helps in removing the biodegradable waste.

(b) In a food chain the energy moves progressively through the various trophic levels, it is no longer available to the previous level (autotrophs) and the energy captured by the autotrophs does not go back to the solar input. Hence, the flow of energy is unidirectional.

Q.2. "Energy flow in a food chain is unidirectional." Justify this statement. Explain how the pesticides enter a food chain and subsequently get into our body.

[CBSE 2015]

Ans. Because the energy moves progressively through the various trophic levels and is no longer available to the previous trophic level. The energy captured by autotrophs does not revert back to the solar input.

Pesticides, used for crop rotation when washed down into soil/water body, are absorbed by the plant/producer along with water and minerals.

Being non-biodegradable these chemicals get accumulated progressively in the food chain and enter our body.

Q.3. Aquariums need to be cleaned once in a while, whereas ponds or lakes do not require any cleaning. Explain.

[CBSE 2015]

Ans. There is a need to clean aquarium because it is not a 'self-sustained' ecosystem. Waste in be decomposed as micro aquarium cannot be organisms in it are not active. Ponds and lakes are natural, and self-sustained ecosystem in which microorganisms help in decomposing the waste matters.cultiu

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

[CBSE 2014]

Ans. Each and every trophic level depends for its energy needs on its previous trophic level, if all organisms of any of the trophic levels in a food chain are damaged, the organisms of other trophic levels will also be destroyed because energy flow is stopped from one trophic level to other trophic level.

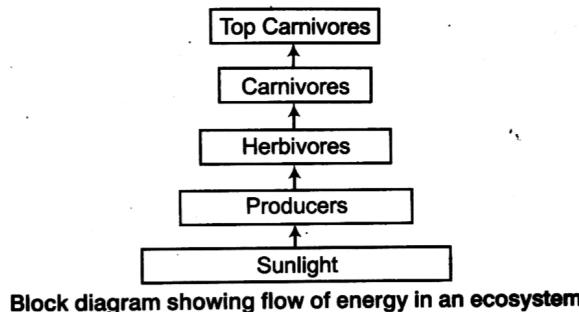
Q.5. What is biological magnification? Will the levels of this magnification be different at different levels of the ecosystem?

[CBSE 2014]

Ans. The accumulation of harmful chemicals in the body of living organisms at different trophic levels in a food chain is called biological magnification. Yes, the concentration of these harmful chemicals will be different at different trophic levels. It will be maximum at the last trophic level which is mostly of the top carnivores (quaternary consumers).

Q.6. Define an ecosystem. Draw a block diagram to show the flow of energy in an ecosystem. [CBSE 2019]

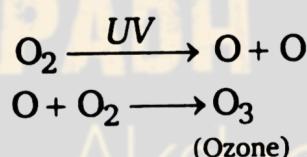
Ans. All the interacting organisms in an area together with the non-living constituents of the environment form an ecosystem. Ecosystem consists of biotic and abiotic components.



Q.7. State one important function of ozone layer in the atmosphere. How is it formed there? Which compounds are responsible for the depletion of ozone layer? How do these compounds enter into the atmosphere? [CBSE 2012,13,15]

Ans. Ozone present in the upper regions of the atmosphere protects us from dangerous UV radiations.

Formation of ozone layer Ozone at the higher levels of the atmosphere is a product of UV radiations acting on oxygen (O_2) molecule. The higher energy UV radiations split apart some molecular oxygen (O_2) into free oxygen (O) atoms. These atoms then combine with the molecular oxygen to form ozone as shown



Chlorofluorocarbons (CFCs) are responsible for the depletion of ozone layer. These compounds enter the atmosphere through sprays, aerosols, refrigerators, air conditioners etc., which use CFCs.

Q.8. What would happen if number of carnivores decreases in an ecosystem? [CBSE 2013]

Ans. (i) Population of herbivores will increase beyond control.

(ii) Autotrophs will disappear from earth due to overgrazing done by herbivores.

(iii) Both these factors may disturb food chains thus affecting the ecosystem.

Q.9. State with reason any two possible consequences of elimination of decomposers from the earth. [CBSE 2015]

Ans. Two possible consequences of elimination of decomposers from the earth would be

1. Increase in complex organic substances will cause land and water pollution as well as air pollution.

2. It may disturb ecosystem as without decomposition, soil will not be replenished, which is essential for 'plants' which forms the basis of an ecosystem.

Q.10. If all the waste we generate is biodegradable, will this have no impact on the environment?

[CBSE 2012,13]

Ans. The biodegradable wastes do not persist for a long time in the environment. However, they also cause harmful effects but these effects are only for sometime. These wastes can be converted into broken into simple useful substances and broken substances by the action of microorganisms. So, there will be impact of biodegradable waste but for a short time.

Q.11. List two causes of depletion of ozone layer. Mention any two harmful effects of depletion of this layer.

[CBSE 2012]

Ans. Two causes of depletion of ozone layer are

- (i) Use of CFCs (Chlorofluorocarbons) in refrigeration.
- (ii) Use of CFCs in fire extinguishers and aerosol sprayers.

The harmful effects of depletion of ozone layer are

- (i) Due to depletion of ozone layer, UV radiations reach the earth. These UV radiations cause skin cancer, damage to eyes and immune system.
- (ii) This depletion of ozone layer may also lead to variations in global rainfall, ecological disturbances and dwindling of global food supplies.

Q.12. How can we help in reducing the problem of waste disposal? Suggest any three methods.

[CBSE 2019]

Ans. The problem of waste disposal can be reduced by the following ways:

(a) Recycling: Different kind of solid wastes like paper, plastics, etc., can be recycled. For example, waste paper is sent to the paper mills where it is reprocessed to produce new paper.

(b) Composting : Biodegradable domestic wastes such as left-over food, fruit and vegetable peels, leaves of potted plants, etc., can be converted into compost by burying them in a pit dug into ground.

(c) Biogas and manure : Organic wastes can also be decomposed anaerobically to yield biogas and manure.

(d) Burning : The solid combustible waste is burnt. It however, causes air pollution.

(e) Sewage treatment plants (STPs) : The dirty drain water containing urine and faeces, which is carried from our homes by underground pipes (called sewers) is called sewage. Sewage should always be disposed off by treating it in sewage treatment plants(STPs). The treatment results in the production of clean water, which is then discharged into river.

Q.13. Distinguish between biodegradable and non-biodegradable substances by given one example of each from our daily life. List two effects of each of them on our environment.

[CBSE 2012,13,14,15,16]

Ans

Biodegradable substances	Non-biodegradable substances
<ol style="list-style-type: none">1. Substances that are broken down by biological processes are said to be biodegradable.2. These substances get recycled and, therefore, do not require any dumping sites. Example Paper, cotton clothes, peel of vegetable etc.	<p>Substances that are not broken down by biological processes are said to be non-biodegradable.</p> <p>These substances require a lot of space for dumping which causes wastage of land.</p> <p>Example Plastic, glass, DDT etc.</p>

Effects of biodegradable substances

1. They release harmful gases like methane, ammonia, carbon dioxide, hydrogen sulphide etc. during decomposition process.
2. They release foul smell only during decomposition process but they do not cause any type of soil pollution.

Effects of non-biodegradable substances

1. They persist in the environment for a long time and thus, harm the various members of the ecosystem.
2. They release very harmful gases when they are acted upon by physical processes like heat and pressure.
3. They cause pollution of air, soil and water.

Q.1.(i) What is the full form of:

- (a) UNEP, (b) CFCs.

(ii) On what basis are organisms grouped as producers, consumers and decomposers?

(iii) Write two problems that would arise if there were no decomposers in an ecosystem.

[CBSE 2011,12,13]

Ans. (i) The full form of

- (a) UNEP United Nations Environment Programmes.
- (b) CFCs Chlorofluorocarbons.

(ii) Organisms can group as producers, consumers and decomposers according to the manner in which they obtain their sustenance from the environment.

(iii) Two problems that would arise in absence of decomposers in an ecosystem are

- (a) Decomposition of garbage as well as dead plants and animals will not take place.
- (b) Natural replenishment of soil will not take place.

Q.2. Define the following

(i) Food chain, (ii) Trophic level,

(iii) Producers, (iv) Parasites,

(v) Non-biodegradable substances.

[CBSE 2014]

Ans. (i) Food chain A succession of organisms in an ecological community that constitutes a continuation of food energy from one organism to another as each consumer a lower member and in turn is preyed upon by a higher member is called a food chain.

(ii) Trophic level Each step or level of the food chain is called trophic level.

(iii) Producers Producers are organisms like plants and blue green algae that produce complex organic compound from simple inorganic molecules using energy from sunlight in presence of chlorophyll.

(iv) Parasites An organism that lives on or in another organism, obtain nourishment and protection while offering no benefit in return is called a parasite.

(v) Non-biodegradable substance

Substances that cannot be broken down by biological processes are called non biodegradable substances.

Q.3. Name the following

(i) Organisms feeding on animal and plant food.

(ii) Organisms breaking down wastes of living beings.

(iii) The organisms occupying the first trophic level of any food chain.

(iv) A complex network of many interconnected food chains and feeding relationships.

(v) The cumulative increase in the concentrations of persistent a substance in successively higher levels of the food chain.

[CBSE 2012]

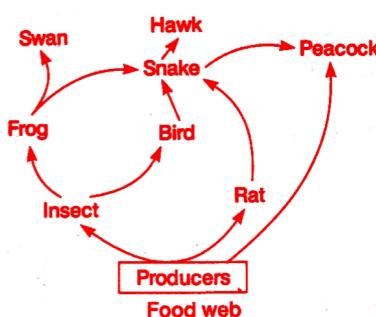
Ans. (i) Omnivores, (ii) Decomposers,

(iii) Producers, (iv) Food web,

(v) Biological magnification.

Q.4. What are food chains and food webs? Why are smaller food chains better? What is 10% flow? [CBSE 2011]

Ans. **Food chain** The flow of food from sun to autotrophs, from autotrophs to herbivores and from herbivores to carnivores is called food chain. A food chain can have two levels or five to six levels also.



Food web When an organism is eaten by two or more other kinds of organisms, instead of straight chain an interlinked chain is formed, is termed as food web. Smaller the food chain the energy available for the next level of consumer in such a chain is more. As the loss of energy at each step takes place and very little energy is left after four trophic levels.

The green plants in terrestrial ecosystem capture about 1% of the sun's energy and convert it into food energy. When green plants are eaten by primary consumers a great deal of energy is lost for the life processes and only 10% of the energy is available for the next level of consumers.

Q.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? [CBSE 2011,14]

Ans. Yes, the impact of removing all the organisms in a trophic level will be different for different trophic levels.

For example Consider the following food chain

Plants → Deer → Lion

If all the lions are removed, then the population of deer will increase to such a larger extent and this may result in the following problems

(i) Due to overgrazing caused by deers, soil erosion can take place and forest area will get affected.

(ii) Due to large deer population, competition for food will start.

Similarly, if deers are removed, then carnivores will get affected. Whereas removal of producers (plants) will affect both deers and lions.

This all suggests that all different organisms in a food chain are linked together and removal of any organism will have different effect but it will cause an ill effect on the survival of that ecosystem.

Q.6. Give any two examples of each

- (i) Organisms occupying the trophic level (ii) Carnivores
- (iii) Biodegradable wastes of humans (iv) Ecosystem
- (v) Abiotic factors of an ecosystem

[CBSE 2014]

Ans. (i) Trees, Shrubs, (ii) Lion, Cheetah, (iii) Used and torn paper, broken pieces of wooden furnitures, (iv) Forest, Garden, (v) Temperature, rainfall.

Q.7. Why is damage to the ozone layer a cause for concern? What steps are being taken to limit this damage? [CBSE 2010,12,13,17]

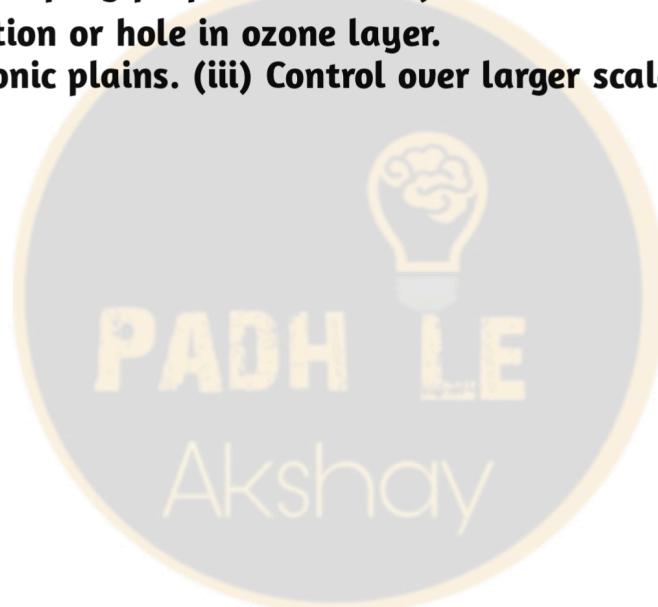
Ans. Enlargement of ozone hole will cause more ultraviolet rays to reach on the earth's surface.

This is very harmful for us, animals and microorganisms in the following ways

- (i) Ultraviolet radiations may cause skin disease, especially skin cancer.**
- (ii) Plant life will be disturbed due to retarded growth and destruction of pigments.**
- (iii) UV-rays may kill microorganisms, decomposers and other useful microbes. It may lead to ecological imbalance.**

Steps to prevent damage of ozone layer as

- (i) Judicious use of aerosol spray propellants such fluorocarbon and chlorofluorocarbons (CFCs) which cause depletion or hole in ozone layer.**
- (ii) Limited use of supersonic plains. (iii) Control over larger scale nuclear explosions.**



The activities of man had adverse effects on all forms of living organisms in the biosphere. Unlimited exploitation of nature by man disturbed the delicate ecological balance between the living and non-living components of the biosphere. The unfavourable conditions created by man himself threatened the survival not only of himself but also of the entire living organisms on the mother earth. One of your classmates is an active member of 'Eco club' of your school which is creating environmental awareness amongst the school students, spreading the same in the society and also working hard for preventing environmental degradation of the surroundings.



- (a) Why is it necessary to conserve our environment?
- (b) State the importance of green and blue dustbins in the safe disposal of the household waste.
- (c) List two values exhibited by your classmate who is an active member of Eco-club of your school.

Ans. (a) Two reasons for the conservation of the environment

- (i) To save air, water and soil from pollution.
- (ii) To maintain ecological balance in nature.

(b) Green dustbins are used for biodegradable waste, and blue dustbins for non biodegradable waste. This segregation is done for proper disposal of waste without wasting time and energy in segregating the biodegradable and non-biodegradable wastes.

(c) Values Cooperative spirit, concern about environment, civic sense. (any two)