

OUR ENVIRONMENT

VERY SHORT ANSWER TYPE QUESTIONS [1 Mark]

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

Answer. If we kill all the organisms in one trophic level, the following effects will take place:

- The population of organisms in previous trophic level will increase.
- The organisms in next trophic level will not be able to get the food, so they will migrate to some other ecosystem or die.
- It will cause an ecological imbalance in the food chain.

2. **Why did United Nations act to control the production of chlorofluorocarbons (CFCs) used in refrigerators?**

Answer. CFCs deplete the ozone layer around the earth, hence their production is controlled by United Nations.

3. **Which compounds are responsible for the depletion of ozone layer?**

Answer. The compounds responsible for the depletion of ozone layer are chlorofluorocarbons (CFCs).

4. **Define 'trophic level'.**

Answer. Trophic level is the position that an organism occupies in a food chain, where transfer of food or energy takes place.

5. **What are the various steps in a food chain called?**

Answer. The various steps in a food chain are called trophic levels.

6. **What is the important function of presence of ozone in earth's atmosphere?**

Answer. The important function of presence of ozone in earth's atmosphere is that it shields the surface of the earth from ultraviolet (UV) radiations of the sun.

7. **Give an example to illustrate that indiscriminate use of pesticides may result-in the degradation of the environment.**

Answer. The pesticides used in crop field are washed down into the water bodies. From water bodies, these are absorbed by aquatic plants and animals of a food chain and thereby degrades the environment.

8. **Why is it necessary to conserve our environment?**

Answer. It is necessary to conserve our environment to prevent depletion of natural resources and environmental damage, thereby sustaining life.

9. **What is meant by a biodegradable waste?**

Answer. Biodegradable wastes are those substances which are broken down into simpler, harmless substances in nature in due course of time by the biological processes such as action of micro organisms like certain bacteria.

Examples: Urine and faecal matter, sewage, agricultural residue, paper, wood, cloth and cattle dung.

10. **What is the role of decomposers in the ecosystem?**

Answer. Role of decomposers in the environment:

- They return the nutrients to the nutrient pool.
- They help in completing the different bio-geochemical cycles, thus they maintain the balance in the ecosystem.

11. **What step is being taken to limit the damage to the ozone layer?**

Answer.

Judicious use of aerosol spray propellants such as fluorocarbon and chlorofluorocarbons which cause depletion or hole in ozone layer.

Control over large scale nuclear explosions and limited use of supersonic planes.

12. **Why are some substances non- biodegradable?**

Answer. Some substances are non-biodegradable because they cannot be broken down into simpler harmless substances in nature.

13. **Which class of chemicals is linked to the decrease in the amount of ozone in the upper atmosphere of the earth?**

Answer. The chemical compound Chlorofluorocarbon is responsible for decrease of ozone in the upper atmosphere of the earth.

14. **Name two decomposers operating in our ecosystem.**

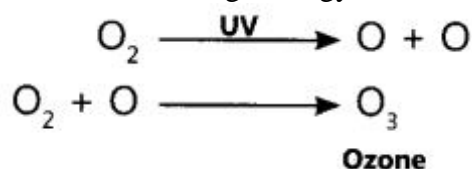
Answer. Bacteria and fungi.

15. **Select two non-biodegradable substances from the following waste generated in a kitchen: spoiled food, paper bags, milk bags, vegetable peels, tin cans, used tea leaves.**

Answer. Milk bags and tin cans.

16. **What happens when higher energy ultraviolet radiations act on the oxygen at the higher level of the atmosphere?**

Answer. When high energy ultraviolet radiations act on oxygen, ozone is produced:



17. **In a food chain, 10,000 joules of energy is available to the producer. How much energy will be available to the secondary consumer to transfer it to the tertiary consumer?**

Answer. 10 J will be available to the secondary consumer to transfer to the tertiary consumer.

18. **Write the name and formula of a molecule made up of three atoms of oxygen.**

Answer. Ozone and its chemical formula is O_3 .

19. **List two man-made ecosystems.**

Answer. Garden and Pond are man-made ecosystems.

20. **Consider the following food chain which occurs in a forest: Grass -> Deer -> Lion**

If 10000 J of solar energy is available to the grass, how much energy would be available to the deer to transfer it to the lion?

Answer. 10 J energy would be available to deer to transfer to lion.

21. **Which of the following belong to the first trophic level of a food chain? Grass, Grasshopper, Plants, Rat, Tiger**

Answer. Grass and plants belong to the 1st trophic level of a food chain.

22. **Name the phenomenon in which non-biodegradable chemicals get accumulated progressively at each trophic level of a food chain.**

Answer. Biological magnification.

23. **How is the increase in demand for energy affecting our environment adversely?**

Answer. The increase in demand for energy affects our environment adversely. Due to this increase, pollutants like CO , CO_2 , SO_2 , etc., are released in to the atmosphere which leads to greenhouse effect.

24. **Why is ozone layer getting depleted at the higher levels of the atmosphere?**

Answer. Ozone layer is getting depleted at the higher levels of the atmosphere due to effect of chlorofluorocarbons (CFC_s) which are used as refrigerants and in fire extinguishers.

25. **Name any two abiotic components of an environment.**

Answer. Two abiotic components of an environment are temperature and rainfall.

26. **What are the two main components of our environment?**

Answer. The two main components of our environment are the biotic or living components and abiotic or non-living components.

27. **Why are green plants called 'producers'?**

Answer. Green plants are called 'producers' because they can produce food by photosynthesis in the presence of sunlight.

28. **Which disease is caused in human beings due to depletion of ozone layer in the atmosphere?**

Answer. Skin cancer is caused in human beings due to the depletion of ozone layer in the atmosphere.

29. Why should biodegradable and non-biodegradable wastes be discarded in two separate dustbins?

Answer. Biodegradable materials are broken down by microorganisms in nature into simple harmless substances. Non-biodegradable materials need a different treatment like heat and temperature and hence these should be discarded in separate bins.

30. List two natural ecosystems.

Answer. Two natural ecosystems are forest and river.

31. List two biotic components of a biosphere.

Answer. Two biotic components of a biosphere are plants and animals.

32. What will be the amount of energy available to the organism of the 2nd trophic level of a food chain, if the energy available at the first trophic level is 10,000 joules?

Answer. 100 Joules of energy will be available to the organism of the 2nd trophic level.

33. The following organisms form a food chain. Which of these will have the highest concentration of non-biodegradable chemicals? Name the phenomenon associated with it. Insects, Hawk, Grass, Snake, Frog.

Answer. Hawk will have highest concentration of non-biodegradable chemicals. The phenomenon is called biomagnification.

34. List two criteria of measuring the biodiversity of an area.

Answer. One measure of the biodiversity of an area is the number of species found there. Secondly, the range of different life forms is also important.

35. The first trophic level in a food chain is always a green plant. Why?

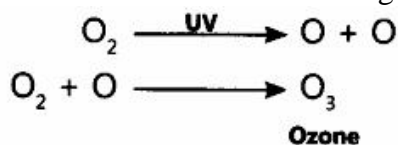
Answer. Only green plants can make their own food from sunlight. Green plants therefore, always occupy the 1st trophic level in a food chain.

SHORT ANSWER TYPE QUESTIONS [I] [2 Marks]

36. How is ozone formed in the upper atmosphere? Why is the damage of ozone layer a cause of concern to us? State a cause of this damage.

Answer. Ozone is formed in upper atmosphere by the reaction of ultraviolet (UV) radiations on oxygen (O_2) molecule.

The damage to ozone layer is a cause of concern to us as due to its damage, more ultraviolet rays reach the earth's surface causing various health hazards.



A cause of this damage is the presence of large amount of chlorofluorocarbons in the atmosphere.

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

Answer. Two problems caused by non-biodegradable waste that we generate in our daily life are:

- It clogs drains.
- It causes water and soil pollution.

38. What are biodegradable and non- biodegradable substances? Select two biodegradable pollutants from the following: Agricultural waste, glass, plastic, sewage, DDT.

Answer. Biodegradable substances are those substances which are broken down into simpler, harmless substances in nature in due course of time by the biological processes such as micro organisms like certain bacteria.

Non-biodegradable substances are those substances which cannot be broken down into simpler, harmless substances in nature.

Two biodegradable pollutants are agricultural waste and sewage.

39. **Construct an aquatic food chain showing four trophic levels.**

Answer. Food chain in aquatic ecosystem:

Phytoplankton → Zooplankton → Crustacean → Fish → Crane
(Producer) (Herbivore) (Carnivore) (Carnivore) (Top Carnivore)

40. **Explain ‘biological magnification’ with the help of an example.**

Answer. Pesticides used in crops are washed down into the soil. From soil these are absorbed by plants along with water and minerals and thus, they enter the food chain. While consuming the crops, human beings also consume these pesticides which get accumulated in our bodies. This phenomenon is known as biological magnification.

41. **Describe how decomposers facilitate recycling of matter in order to maintain balance in the ecosystem.**

Answer. Decomposers are micro organisms that obtain energy from the chemical breakdown of dead organisms of animals or plants. These micro organisms breakdown the complex organic substances of dead organisms into simple inorganic substances that go into the soil and are used up once more by the plants. Decomposers thus, help in recycling of matter.

42. **What is biodiversity? What will happen if biodiversity of an area is not preserved? Mention one effect of it.**

Answer. Biodiversity is the existence of a wide variety of species of plants, animals and microorganisms in a natural habitat within a particular environment or existence of genetic variation within a species. Biodiversity of an area is the number of species or range of different life forms found there. Forests are ‘biodiversity hotspots’.

Every living being is dependent on another living being. It is a chain. If biodiversity is not maintained, the links of the chain go missing. If one organism goes missing, this will affect all the living beings who are dependent on it.

43. **What is meant by biodiversity? List two advantages of conserving forests and wildlife.**

Answer. Biodiversity is the existence of a wide variety of species of plants, animals and microorganisms in a natural habitat within a particular environment.

Two reasons each of conserving:

(a) Forest

(i) It helps in retaining the sub-soil water.

(ii) It checks flood.

(b) Wildlife

(i) To maintain ecological equilibrium.

(ii) To protect the nature.

44. **Why we say energy flow in the biosphere is unidirectional?**

Answer. The energy flow through different steps in the food chain is unidirectional. This means that energy captured by autotrophs does not revert back to the solar input and it passes to the herbivores, i.e. it moves progressively through various trophic levels. Thus, energy flow from the sun through producers to consumers is in single direction only.

45. **How can we help in reducing the problem of waste disposal? Give any two methods.**

Answer. Problem of waste disposal can be solved by following methods:

(i) by disposing biodegradable and non-biodegradable waste separately.

(ii) by reusing materials as much as possible.

46. **“Damage to the ozone layer is a cause for concern.” Justify this statement. Suggest any two steps to limit this damage. ‘**

Answer. Ozone layer prevents the harmful ultraviolet radiation to enter the atmosphere and reach the earth’s surface. Depletion of ozone layer has become a cause for concern because it can cause serious effects on human body and other organisms of the environment like fatal diseases such as skin cancer, changes in genetic material DNA, eye damage, etc.

Two steps to limit this damage are as follows:

- Judicious use of aerosol spray propellants such as fluorocarbon and chlorofluorocarbons which cause depletion or hole in ozone layer.
- Control over large scale nuclear explosions and limited use of supersonic planes.

SHORT ANSWER TYPE QUESTION[II] [3 Marks]

47. (a) What is ‘environmental pollution’?

(b) Distinguish between biodegradable and non-biodegradable pollutants.

(c) Choose the biodegradable pollutants from the list given below:

Sewage, DDT, radioactive waste, agricultural waste.

Answer. (a) Environmental pollution is an undesirable change in the physical, chemical or biological

characteristics of the natural environment, brought about by man’s activities. This pollution may affect the soil, rivers, seas or the atmosphere.

(b)

| Biodegradable pollutants | Non-biodegradable pollutants |
|---|---|
| (i) These pollutants can be broken-down into nonpoisonous substances in nature by the action of microorganisms. | (i) These pollutants cannot be broken-down into non-poisonous substances by microorganisms. |
| (ii) They get recycled thus, do not need any dumping sites. | (ii) They cannot be recycled thus, require dumping sites. |
| (iii) These are obtained from living things. | (iii) These are obtained from non-living things. |
| (iv) They cause minimum environmental pollution. | (iv) They cause environmental pollution. |

(c) Biodegradable pollutants are sewage and agricultural waste.

48. **Why are bacteria and fungi called decomposers? List any two advantages of decomposers to the environment.**

Answer. Bacteria and fungi breakdown the dead remains and waste products of organisms. These micro organisms are called the decomposers as they breakdown the complex organic substances into simple inorganic substances that go into the soil and are used up once more by the plants.

Two advantages of decomposers to the environment are as follows:

- Decomposers feed, on the dead bodies of plants and animals. They return the simple components to soil and help in making the steady state of ecosystem by recycling of nutrients. They, therefore, create a balance in the environment.
- They also act as scavengers or cleansing agents of the atmosphere.

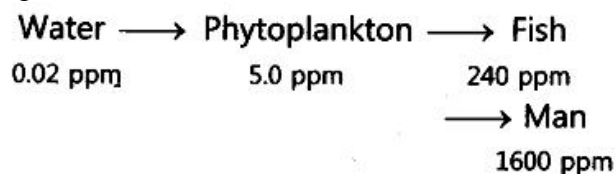
49. **Explain the phenomenon of “biological magnification” How does it affect organisms belonging to different trophic levels particularly the tertiary consumers?**

Answer. The process in which harmful chemicals enter a food chain and get accumulated progressively at each trophic level is called biological magnification.

Harmful and toxic chemicals enter our bodies when they are added to soil and water. Use of pesticides to protect the food crops from diseases and pests and chemical wastes of factories are dumped in open or disposed off into rivers. These chemicals are washed down into the soil and ultimately to water table or get absorbed or taken up from the soil by the plants along with water and minerals and in this way harmful chemicals enter the food chain. The quantity of these harmful chemicals increase with increase in trophic level of the food chain because these substances are not degradable. Man is at the top of the food chain, so concentration is maximum in human beings.

Thus, accumulation of DDT has been maximum in man as DDT is used to destroy pests. DDT is accumulated in the following way in this food chain:

This is the reason why our food grains such as wheat and rice, vegetables and fruits and even meat contain varying amounts of pesticides residues. So, the highest trophic level at the extreme right of food chain has the maximum concentration of harmful chemicals in a food chain.



LONG ANSWER TYPE QUESTIONS [5 MARKS]

50. A non-biodegradable toxic chemical has entered into the food chain. Which type of food habit will you suggest to a man, vegetarian or non-vegetarian? Explain with the help of a food chain. The food chain which you would suggest, is advantageous in an another aspect. How?

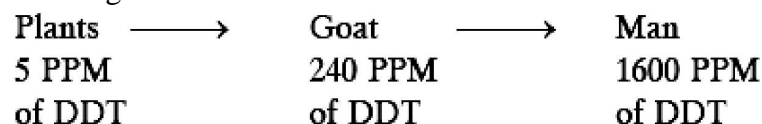
Answer. Vegetarian food chain will be suggested in case of entry of non-biodegradable toxic chemical into the food chain.

Non-biodegradable chemical gets concentrated at every trophic level by the process of biological magnification. As the concentration increases with the number of trophic level in a food chain, man will get high concentration of the chemical in a non-vegetarian food chain than in a vegetarian food chain, e.g.

Vegetarian food chain:



Non-vegetarian food chain:



Vegetarian food chain is advantageous in terms of energy available to man because it has less number of trophic levels. As 90% of energy is lost to the environment, at every trophic level, lesser number of trophic levels will result in lesser energy loss.

51. Write a note on the producers, consumers and decomposers of the biotic environment with examples of each.

Answer.

Producers: Those organisms which produce food by photosynthesis, i.e. organisms which can make organic compounds like sugar and starch from inorganic substances using the radiant energy of the sun in the presence of chlorophyll. Producers, therefore are considered as a source of energy for those above it in a food chain.

Examples: All green plants also called autotrophs and certain blue-green algae.

Consumers: Those organisms which depend upon the producers for food, either directly or indirectly by feeding on other consumers for their sustenance. Consumers, therefore, feed upon those below it in a food chain and are called heterotrophs. These can be classified into primary consumers or herbivores, secondary consumers or small carnivores, omnivores and parasites, e.g. cows, humans.

Examples of consumers:

Herbivores are the animals that consume or eat vegetation or plants, e.g. cows, horses.

Carnivores are the animals that eat flesh of other animals, e.g. tigers, wolves.

Omnivores are the animals that eat both plants and animals, e.g. humans, cockroaches.

Parasites are those organisms that live on (ectoparasites) or in (endoparasites), the body of another organism, i.e. host from which it obtains its nutrients, e.g. parasites of man includes fleas and lice (ectoparasites), various protozoans and tapeworms. (endoparasites)

Decomposers: They are those microorganisms that obtain energy from the chemical breakdown of dead organisms or animal or plant wastes. These microorganisms are the decomposers as they breakdown the complex organic substances into simple inorganic substances that enter into the soil and are again used up by the plants.

Examples: Bacteria and fungi.

