

Important Questions for Class-X Science

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Class-X
Science
Chapter 15, Our Environment
Subjective

1) What are energy pyramids? (1 marks)

Answer: An energy pyramid is the graphic representation of a food chain in terms of the energy contained at each trophic level. The size of each level in an energy pyramid is dependent on the size of the level immediately below.

2) Name the process in which a harmful chemical enters the food chain and gets concentrated at each level in the food chain. (1 marks)

Answer: The process through which harmful chemicals such as pesticides, fertilizers used in agriculture are taken by plants while growing and further passed on to higher trophic level of every food chain is termed as biological magnification.

3) What is the role of ozone layer in the atmosphere? (2 marks)

Answer: Ozone layer protects the Earth's surface from the harmful UV radiations of the sun. Excess amount of chlorofluorocarbon compounds released from refrigerators and fire extinguishers into the atmosphere is found to endanger the ozone layer. Hence their depletion will lead to harmful effects on living organisms like skin cancer etc.

4) How disposable garbage can be made eco friendly? (2 marks)

Answer: Several methods for eco-friendly disposal of garbage have been noted like biodegradable and non-biodegradable wastes should be segregated so that biodegradable wastes can be used for preparing manure and non biodegradable wastes from industries should be treated before dumping.

5) Describe the flow of energy between various trophic levels of food chain. (5 marks)

Answer: The flow of energy is unidirectional. The energy that is captured by the autotrophs does not revert back to the solar input and the energy which is passed to herbivores does not come back to autotrophs. So, as it

moves progressively through various trophic levels it is no longer available to the previous levels.

- The green plants in a terrestrial ecosystem capture about 1% of the sunlight that falls on them and convert it into food energy.
- When green plants are eaten by primary consumers, a high amount of energy is lost as heat to the environment, some goes into digestion and rest into growth and reproduction. Only 10% of the energy is made available for the next level of consumers.
- The loss of energy at each level of the food chain is so great that only very little usable energy remains at the last level.
- Thus, there are generally a greater number of individuals at the lower trophic level of an ecosystem and less number of tertiary or quaternary consumers.

6) How are food chains and food web related to each other? (2 marks)

Answer: A food chain is the sequence of who eats whom in a biological community (an ecosystem) to obtain nutrition. A network of many food chains operating in an area is called a food web.

7) Name the two main components of our environment. (1 marks)

Answer: The two main components of environment are biotic (living organisms) and abiotic (non-living) components.

- 8) (a) When a population of animal 'X' was introduced into a grass land community, the number of lions increased while the number of rabbits decreased. What is animal 'X'?**
(b) Explain why productivity declines at each trophic level? (3 marks)

Answer: (a) Animal 'X' is a carnivore that is a predator of rabbits but a prey of the lions. The X animal can be a deer or fox, which eats rabbit and is itself eaten by lions. Since deer is a herbivore, X is possibly fox.

(b) In any food web, energy is lost each time one organism eats another. Because of this, there have to be many more plants than the plant-eaters. There are more autotrophs than heterotrophs, and more plant-eaters than meat-eaters. Each level can transfer only about 10% energy available to it because some of the energy is used up by the organism and some is lost as heat at each level.

**9) What are the various trophic levels of the food chain?
Explain with the help of an example of a food chain.
(5 marks)**

Answer: The trophic level of an organism is the position it holds in a food chain. A food chain usually consists of 4-5 levels.

1. Primary producers ; the organisms that make their own food from sunlight, forms the base of every food chain. These organisms are called as autotrophs.
2. Primary consumers are animals that eat primary producers; they are also called herbivores (plant-eaters).
3. Secondary consumers eat primary consumers. They are carnivores (meat-eaters) and omnivores (animals that eat both animals and plants).
4. Tertiary consumers eat secondary consumers.
5. Quaternary consumers eat tertiary consumers.

Food chains "end" with top predators, animals that have little or no natural enemies.

Example: Food chain in a Grassland biome.

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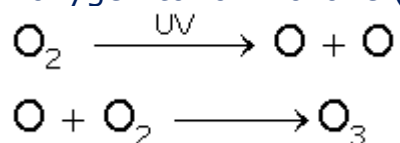
**10) Which organisms help in recycling dead plants and animals?
(3 marks)**

Answer: When any organism dies, it is eventually eaten by detritivores (like vultures, worms and crabs) and broken down by decomposers, mostly bacteria and fungi. These are the decomposers which break down organic material and release nutrients for recycling in to the food chain.

**11) (a) Describe the formation of ozone.
(b) What are the benefits of ozone layer?
(c) Name the pollutant responsible for ozone depletion.
(5 marks)**

Answer: (a) In the upper atmosphere, UV radiations split apart some molecular oxygen (O_2) into free oxygen atoms (O). These atoms combine

with molecular oxygen to form ozone (O₃).



(b) The sunlight consists of ultra violet radiations which are harmful for human beings as they can cause cancer, damage human immune system and cause cataract. They also reduce photosynthesis in plants. Thus, ozone layer is essential to life as it shields damaging ultra violet radiations from entering the troposphere and thus save us from the harmful effects of UV radiations .

(c) Chlorofluorocarbon compounds (CFCs) are responsible for depleting ozone layer. CFCs are synthetic chemicals used as refrigerants and in fire extinguishers.

