CBSE Test Paper 04

Chapter 15 Our Environment

1. Montreal protocol became effective in**: (1)**

    a. 1985
    b. 1987
    c. 1992
    d. 1989

2. A food chain always starts with**: (1)**

    a. Respiration
    b. Decomposition
    c. Photosynthesis
    d. Nitrogen fixation

3. According to 10% law, the energy available to each successive level is _____ of the previous level. **(1)**

    a. 100%
    b. 10%
    c. None
    d. 1%

4. In a given food chain, suppose the amount of energy available at the third trophic level is 50 KJ. What will be the energy available at the producer level? **(1)**

    a. 5000 KJ
    b. 50 KJ
    c. 5 KJ
    d. 500 KJ

5. Which of the following limits the number of trophic levels in a food chain? **(1)**

    a. Decrease in energy at higher trophic levels

b. Polluted air
c. Deficient food supply
d. Water

6. Name the radiations absorbed by ozone layer. Give any one cause of the depletion of the ozone layer. Name a disease likely to be caused due to depletion. **(1)**
7. What percentage of solar energy is trapped and utilized by plants? **(1)**
8. What are two main components of ecosystem? **(1)**
9. Write a food chain having two trophic levels. **(1)**
10. Give any two ways in which biodegradable substances would affect the environment. **(3)**
11. Write short note on food pyramid. **(3)**
12. State any three ways of effective Garbage disposal so that pollution caused by it can be minimized. **(3)**
13. Why plants are called as producers? **(3)**
14. What are the two main components of an ecosystem? Describe the physical factors which affect the distribution of organisms in different habitats. **(5)**
15. Why is it difficult to draw sharp boundaries between ecosystems? **(5)**

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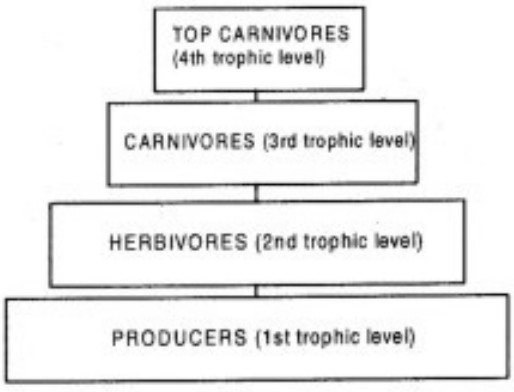
Answers

1. d. 1989
   Explanation: The **Montreal Protocol** became effective in 1989. The **Montreal Protocol** is a protocol to the Vienna Convention for the Protection of the Ozone Layer. It is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion.
2. c. Photosynthesis
   Explanation: A food chain in an ecosystem always starts with photosynthesis. The autotrophs or the producers are at the first trophic level. They fix up the solar energy and make it available for heterotrophs or the consumers.
3. b. 10%
   Explanation: According to 10% law, the energy available to each successive trophic level is 10% of the previous trophic level. An average of 10% of the food eaten by a consumer is turned into its own body and made available for the next level of consumers. 10% can be taken as the average value for the amount of organic matter that is present at each step and reaches the next level of consumers.
4. a. 5000 KJ
   Explanation: According to 10% law, the energy available to each successive trophic level is 10% of the previous trophic level.
   Given, energy available at the third trophic level = 50 KJ
   Energy available at second trophic level = 50 KJ x 10 = 500 KJ
   Therefore, energy available at the producer level (first trophic level) = 500 KJ x 10 = 5000 KJ
5. a. Decrease in energy at higher trophic levels
   Explanation: There is a loss of energy as the energy is transferred from a lower trophic level to a higher trophic level; this limits the number of trophic

levels in a food-chain. The food chains generally consist of only three or four steps since very little usable energy remains after four trophic levels.

6. Ozone layer absorbs the harmful ultraviolet radiations from sun.
   One cause of the depletion of the ozone layer is the use of Chlorofluorocarbons (CFC_s) in various objects such as refrigerators. Ozone layer depletion may lead to skin cancer in human beings.
7. Plants trap only 1% of total sun's energy, which is utilized by plants in the process of photosynthesis.
8. An ecosystem has two types of components, biotic component and abiotic component.
9. Plants $\rightarrow$ Man
10. Accumulation of biodegradable waste leads to the following problems.
    a. They will serve as breeding ground for flies and mosquitoes which are carriers of disease like cholera, malaria etc.
    b. Open decomposition of biodegradable waste produces mehane gas which is a green house gas & has a foul smell, thus causing air pollution.
11. Food pyramid: One of the consequences of a food chain is in loss of energy at each step. The more consumers in the chain, the less energy is available at the end. If the food chain is constructed so that the number of energy contents of the producers are placed on top of this pyramid is said to be constructed. A great number of producers are needed to support a lesser number of primary consumers, which in turn can support a still lesser number of secondary consumers and still a few number of tertiary consumers as shown in figure. Thus there is loss of mass and energy at each level of a food chain and if the different trophic levels are arranged, a pyramid is constructed.



12. Pollution caused by garbage can be controlled by-

(a) Recycling of certain wastes products like plastic and paper.
(b) Maximizing the use of biodegradable products like that of paper, cloth bags etc.
(c) Producing biogas from the organic wastes.
(d) Separation of biodegradable and non-bio-degradable waste during disposal.
(e) Making the compost of biodegradable wastes by decomposing them under the layers of soil.

13. Plants are called producers, because they produce thier own food. they do this by using light energy from the sun, carbon dioxide from the air and water from the soil to produce food in the form of glucose (sugar) the process is called photosynthesis.

14. Abiotic (physical) and biotic components are the two main components of an ecosystem.
    Abiotic components or physical environment.
    i. **Temperature.** The physiological and behavioral adaptations of most animals depend upon the changes in the environmental temperature. The rates of photosynthesis and respiration in plants also fluctuate depending upon the change in temperature.
    ii. **Water.** The extent to which an organism is dependant on an abundant water supply depends on its requirements and its ability to conserve it in adverse conditions. Organisms living in dry habitats generally have good water conservation such as in cacti, camels.
    iii. **Light.** This is essential for all green plants and photosynthetic bacteria, and for all the animals dependant on the plants.
    iv. **Humidity.** This is important because it can affect the rate at which water evaporates from the surface of an organism, which in turn influence its ability to withstand drought.
    v. **Wind and air currents.** This particularly applies to plants. Only plants with strong root systems and tough stems can live in exposed places where winds are fierce. Wind is also instrumental in the dispersal of spores and seeds.
    vi. **pH.** This influences the distribution of plants in soil and fresh water ponds. Some plants thrive in acidic conditions others in neutral or alkaline conditions. Most are highly sensitive to changes in pH.

vii. **Soil nutrients.** These particularly affect the distribution of plants in the soil.
viii. **Water currents.** Particularly in rivers and streams. Only organisms capable of swimming or avoiding strong currents can survive.
ix. **Topography.** Minor topographical differences may be just as important in influencing the distribution of organisms as wide geographical separation.
x. **Background.** The distribution of organisms whose shape or colouration are such that they are camouflaged when viewed against a particular background is related to the general texture and pattern of the environment.

15. An ecosystem is an area in which the inputs and outputs can be studied across its boundaries are for convenience it is considered a separate entity. It is important to recognise that ecosystems are not strictly separate. Their boundaries are indistinct and overlapping and some movements always occur from one ecosystem to another in terms of energy and materials. Thus it is difficult to draw sharp boundaries between ecosystems.
    Example. Leaves of riverbank trees dropping in river water represent transfer of energy and material from terrestrial to aquatic ecosystem. Terrestrial birds diving to catch fishes in water bodies make similar transfers from aquatic to terrestrial ecosystems. Soil materials may be eroded from a forest ecosystem and washed into the adjoining stream, or dust blown from a desert ecosystem may deposit over another ecosystem located miles away.