



INDIAN SCHOOL AL WADI AL KABIR



Class: X	DEPARTMENT OF SCIENCE -2021-22 SUBJECT: BIOLOGY	DATE OF COMPLETION: 31.10.21
WORKSHEET NO:3 WITH ANSWERS	TOPIC: OUR ENVIRONMENT	A4 FILE FORMAT (PORTFOLIO)
CLASS & SEC:	NAME OF THE STUDENT:	ROLL NO.

I OBJECTIVE TYPE QUESTIONS

Ia. Fill in the blanks:

1. Depletion of Ozone is mainly due to _____.
2. Substances which can be decomposed by the action of micro-organisms are called as _____ wastes.
3. Man-made ecosystem is called _____ ecosystem.
4. The herbivores occupy the _____ trophic level in the food chain.
5. The flow of energy in an ecosystem is always _____.

Ib. Multiple choice questions:

6. Only _____ % of energy is transferred from one trophic level to the next.
a) 1% b) 10% c) 100% d) 1000%
7. The accumulation of non-biodegradable pesticides in different trophic levels:
a) Biological degradation b) Biological magnification
c) Biological decomposition d) Biological concentration
8. Which of the following is biodegradable?
(a) Aluminum can (b) Polythene bag (c) Cow dung (d) DDT
9. Which one of the following pairs belong to the category of primary consumers?
(a) Eagle and snake (b) Grasshoppers & cattle
(c) Snake and frog (d) Water beetles & fish
10. The depletion of the ozone layer causes
(a) global warming
(b) earthquakes
(c) increased UV radiations
(d) acid rain

Ic. ASSERTION AND REASONING:

For the questions 11 to 13, two statements are given—one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the options (i), (ii), (iii) and (iv) as given below:

- (i) Both A and R are true and R is the correct explanation of the assertion.
- (ii) Both A and R are true but R is not the correct explanation of the assertion.
- (iii) A is true but R is false.
- (iv) A is false but R is true.

11. **Assertion: Green plants of the ecosystem are the producers.**

Reason: Producers trap the radiant energy of the sun and change it into chemical energy to make glucose.

12. **Assertion:** The flow of energy in an ecosystem is unidirectional

Reason: Energy captured by the autotrophs does not get revert back to the solar input and it passes to the herbivores.

13. **Assertion:** Animals adopt different strategies to survive in hostile environment.

Reason: The chameleon changes its skin colour to camouflage and merge with its surroundings.

14. **Assertion:** Aquariums are manmade ecosystems.

Reason: Aquariums are made and maintained by humans.

15. **Assertion: The concentration of nonbiodegradable pesticides is in humans.**

Reason: Humans are at the apex of the food chain.

16. Id. PASSAGE BASED QUESTIONS:

Organisms in food chains are grouped into categories called trophic levels. Roughly speaking, these levels are divided into producers (first trophic level), consumers (second, third, and fourth trophic levels), and decomposers. Producers, also known as autotrophs, make their own food. They make up the first level of every food chain.

Autotrophs are usually plants. Nearly all autotrophs use a process called photosynthesis to create “food” (a nutrient called glucose) from sunlight, carbon dioxide, and water.

Plants are the most familiar type of autotroph, but there are many other kinds. Algae, whose larger forms are known as seaweed, are autotrophic. Phytoplankton, tiny organisms that live in the ocean, are also autotrophs. Some types of bacteria are autotrophs. For example, bacteria living in active volcanoes use Sulphur compounds to produce their own food. This process is called chemosynthesis.

The second trophic level consists of organisms that eat the producers. These are called primary consumers, or herbivores. Deer, turtles, and many types of birds are herbivores. Secondary consumers eat the herbivores. Tertiary consumers eat the secondary consumers. There may be more levels of consumers before a chain finally reaches its top predator. Top predators, also called apex predators, eat other consumers.

Consumers can be carnivores (animals that eat other animals) or omnivores (animals that eat both plants and animals). Omnivores, like people, consume many types of foods. People eat plants, such as vegetables and fruits.

We also eat animals and animal products, such as meat, milk, and eggs. We eat fungi, such as mushrooms. We also eat algae, in edible seaweeds like nori (used to wrap sushi rolls) and sea lettuce (used in salads).

Detritivores and decomposers are the final part of food chains. Detritivores are organisms that eat non-living plant and animal remains. For example, scavengers such as vultures eat dead animals. Dung beetles eat animal faeces.

Decomposers like fungi and bacteria complete the food chain. They turn organic wastes, such as decaying plants, into inorganic materials, such as nutrient-rich soil. Decomposers complete the cycle of life, returning nutrients to the soil or oceans for use by autotrophs. This starts a whole new food chain.

(I). Organisms are grouped into categories called

- a) Food Chains
- b) Food Webs
- c) Trophic Levels
- d) Pyramids

(II). The process of making food using Sulphur is called -

- a) Photosynthesis
- b) Chemosynthesis
- c) Biosynthesis
- d) Synthesis.

(III). What are detritivores?

- a) Organisms that eat dead plants and animals.
- b) Organisms that eat living plants and animals.
- c) Organisms that eat only living plants and animals.
- d) Organisms that eat only living animals.

(IV). What are Phytoplanktons?

- a) Autotrophic tiny organisms that live in the oceans.
- b) Autotrophic algae larger forms known as seaweeds.

- c) Autotrophic green plants
- d) Autotrophic bacteria

- (V). Second trophic level consists of –
- a) Organisms that produce their own food
 - b) Organisms that eat their non-living plants and animals
 - c) Organisms at the apex of the food chain
 - d) Organisms that eat producers.

II. VERY SHORT ANSWERS TYPE QUESTIONS CARRYING 1 MARK EACH

- 17. What are two main components of our environment?
- 18. Why there has been a large hue and cry against the use of CFCs?
- 19. Give an example of food chain of four trophic levels that exists in a grassland.
- 20. Which compounds are responsible for the depletion of ozone layer?
- 21. Name the main source of energy in self-sustaining ecosystem?

III. SHORT ANSWER TYPE QUESTIONS CARRYING 3 MARKS EACH

- 22. Why are some substances biodegradable and some non-biodegradable?
- 23. “Damage to the ozone layer is a cause of concern.” Justify the statement. Suggest any two steps to limit this damage.
- 24. Distinguish between biodegradable and non-biodegradable substances. List two effects of each of them in our environment.
- 25. Why are bacteria and fungi called decomposers? List any two advantages of decomposers to the environment.
- 26. (a) What is an ecosystem? List its two main components.
- (b) We do not clean ponds or lakes but an aquarium needs to be cleaned regularly. Explain.

IV. LONG ANSWER TYPE QUESTIONS CARRYING 5 MARKS EACH

- 27. (a) What is ozone? How is it formed in the atmosphere? Explain with equation.
- (b) How is ozone layer useful?
- (c) Name the substances responsible for the depletion of ozone layer.

- 28. (a) What are trophic levels in a food chain?
- (b) Explain the flow of energy through food chain.
- (c) Write a four trophic level food chain and represented in the form of an ecological pyramid.

- 29. Sita and Lata are neighbours in a colony. Sita maintains a compost pit by using bio-degradable household wastes. Lata throws the household waste in two separate dustbins.
- (a) Whom do you support? Why?
- (b) How is Sita justified.
- (c) Maintaining two dustbins for bio-degradable and non-biodegradable wastes is a good idea. How is Sita’s practice better than that of Lata?

V. BOARD BASED QUESTIONS.

- 30. Why should biodegradable & non-biodegradable wastes be discarded in two different dustbins? (1)
- 31. What is an ecosystem? (1)
- 32. What are decomposers? State the role of decomposers in the environment. (2)

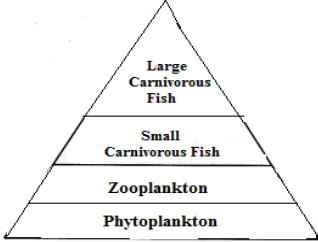
ANSWERS

1. 1	Chlorofluorocarbon
2.	Biodegradable

3.	Artificial ecosystem
4.	Second trophic level
5.	Unidirectional
6.	b) 10%
7.	b) Biological magnification
8.	(c) Cow dung
9.	(b) Grasshoppers & cattle
10.	(c) increased UV radiations
11.	(iv)A is false but R is true.
12.	(i)Both A and R are true and R is the correct explanation of the assertion.
13.	(i)Both A and R are true and R is the correct explanation of the assertion.
14.	(iii)A is true but R is false.
15.	(iv)A is false but R is true.
16.	(I) c. Trophic Levels (II) b. Chemosynthesis (III) a. Organisms that eat dead plants and animals. (IV) a. Autotrophic tiny organisms that live in the oceans. (V) d. Organisms that eat producers.
17.	They can synthesise organic food from inorganic raw materials with the help of solar energy in the process of photosynthesis.
18.	CFCs cause depletion of ozone layer that allows harmful UV radiations to reach the surface of the earth causing skin cancers and defective eye sight.
19.	Grass -----→ Grasshopper-----→ Frog-----→ Snake
20.	ozone-depleting substances (ODS) include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halons, methyl bromide, carbon tetrachloride, hydro-bromo-fluoro-carbons.
21.	Sun

22.	<p>Substances which can be degraded and disposed of naturally by saprophytic organisms or decomposers are called biodegradable, e.g., organic remains, garbage, sewage, livestock waste.</p> <p>Substances which cannot be degraded by saprophytes are known as non-biodegradable. They are mostly man-made articles like pesticides, plastic, polythene, synthetic fibers, etc.</p> <p>Biodegradable articles are formed naturally in biosphere. Decomposer organisms feed on them by secreting digestive juices and absorbing the solubilised substances. Biogenetic nutrients are released in the process called mineralisation.</p> <p>Non-biodegradable articles pile up in nature because decomposers do not have enzymes to degrade them.</p>											
23.	<p>Cause of Concern: 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 appears every year. This has increased the level of UV-B radiations reaching the earth by 15-20%. These radiations are causing increased number of skin cancers, cataracts and reduced immunity in human beings. There is increased incidence of blinding of animals, death of young ones, reduced photosynthesis, higher number of mutations and damage to articles.</p> <p>Steps to Limit Damage -</p> <ol style="list-style-type: none"> 1. Ban on production and use of halons. 2. Ban on production and use of chlorofluorocarbons. 											
24.	<table border="1" data-bbox="269 858 797 1325"> <thead> <tr> <th data-bbox="269 858 797 909">BIODEGRADABLE SUBSTANCES</th> <th data-bbox="805 858 1333 909">NON-BIODEGRADABLE</th> </tr> </thead> <tbody> <tr> <td data-bbox="269 915 797 1026">1. These are substances that can be broken down to simple inorganic substances by the action of microbes naturally</td> <td data-bbox="805 915 1333 1026">1. These are substances that cannot be broken down to simple substances by the action of microbes.</td> </tr> <tr> <td data-bbox="269 1033 797 1115">2. These do not pollute environment much as they are naturally degraded.</td> <td data-bbox="805 1033 1333 1115">2. These cause environmental pollution as they are chemically degraded.</td> </tr> <tr> <td data-bbox="269 1121 797 1232">3. They are considered more environment friendly as their end products can be reused and are not toxic.</td> <td data-bbox="805 1121 1333 1232">3. They are considered non-environmentally friendly as their end products which are chemically produced are toxic.</td> </tr> <tr> <td data-bbox="269 1239 797 1325">4. These substances do not disturb the ecological balance.</td> <td data-bbox="805 1239 1333 1325">4. They create ecological imbalance.</td> </tr> </tbody> </table>	BIODEGRADABLE SUBSTANCES	NON-BIODEGRADABLE	1. These are substances that can be broken down to simple inorganic substances by the action of microbes naturally	1. These are substances that cannot be broken down to simple substances by the action of microbes.	2. These do not pollute environment much as they are naturally degraded.	2. These cause environmental pollution as they are chemically degraded.	3. They are considered more environment friendly as their end products can be reused and are not toxic.	3. They are considered non-environmentally friendly as their end products which are chemically produced are toxic.	4. These substances do not disturb the ecological balance.	4. They create ecological imbalance.	<p>(b) Effects of Biodegradable Substances:</p> <p>Stink: Within a day or so waste biodegradable substances begin to stink and produce foul gases.</p> <p>Pests and Pathogens: The decaying biodegradable substances become breeding places of flies and many other pests. They also contain a number of pathogens. Flies and other pests carry the germs to all the places visited by them resulting in spread of diseases.</p> <p>(c) Effects of Non-biodegradable Substances:</p> <p>Dumping Area: Dumping of non-biodegradable substances on a piece of land converts the same into barren land. It is also called landscape pollution.</p> <p>Biological Magnification: Pesticides, heavy metals and other chemicals enter water and food chains. They accumulate in toxic proportions and harm all kinds of living organisms. Their concentration also increases with rise in trophic level. Human beings are harmed the most because man lies at the top of every food chain.</p>
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25.	<p>(a) Decomposers: Most of the bacteria and fungi are saprophytes. They obtain their nourishment from organic remains. For this they secrete digestive enzymes over the remains. The remains are converted into soluble absorbable form. This results in decomposition of organic matter. Therefore, bacteria and fungi are called decomposers.</p> <p>(b) Advantages:</p> <ol style="list-style-type: none"> 1. Scavengers: Decomposers function as scavengers by removing organic remains and cleansing the earth. 2. Mineralisation: Decomposers release inorganic nutrients trapped in organic remains. The same are recycled.
26.	<p>(a) Ecosystem: It is self-contained ecological system, which consists of a distinct, biotic community and the physical environment both interacting and exchanging materials between them.</p> <p>Main Components,</p> <ol style="list-style-type: none"> 1. Biotic, e.g., producers, consumers 2. Abiotic, e.g., climatic factors, inorganic nutrients. <p>(b) Cleaning an aquarium: 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.</p>
27.	<p>(a) Ozone is triatomic form of oxygen, O₃. Ozone is formed in the upper atmosphere by the action of ultraviolet (UV) radiations over oxygen (O₂)</p> $\text{O}_2 \xrightarrow{\text{UV}} [\text{O}] + [\text{O}]$ $\text{O}_2 + [\text{O}] \longrightarrow \text{O}_3$ <p>(b) The important ozone depleting substances or ODS are chlorofluorocarbons (CFC), methane, N₂O, chlorine, halons and carbon tetrachloride.</p> <p>(c) Refer answer 20</p>

28.	<p>(a) Trophic Levels. They are steps or divisions of food chain which are characterised by particular methods of obtaining food, e.g., producers (T₁), herbivores (T₂), primary carnivores (T₃), etc.</p> <p>(b) Flow of Energy Through Food Chain. Energy enters a food chain through producers. Producers or green plants trap solar energy and convert it into chemical energy of food during photosynthesis. From producers energy passes into herbivores. A lot of energy dissipates during transfer and utilization of food energy by herbivores (10% law). From herbivores the food energy passes into primary carnivores, again with a lot of dissipation. Only about 10% of herbivore energy is passed into body mass of primary carnivores. From primary carnivores, nearly 10% energy passes into secondary carnivores and so on. It is ultimately lost as heat.</p> <p style="text-align: center;"> Sun $\xrightarrow{1\%}$ Producers $\xrightarrow{10\%}$ Herbivores $\xrightarrow{10\%}$ Primary carnivores $\xrightarrow{10\%}$ Secondary carnivores 1,00,000 Cal 1,000 Cal 100 Cal 10 Cal 1 Cal </p> <div style="text-align: center;">  </div> <p>(c) Aquatic Four Trophic Level Food Chain. Phytoplankton \longrightarrow Zooplankton \longrightarrow Small Carnivorous Fish \longrightarrow Large Carnivorous Fish.</p>
29.	<p>(a) Sita. She is sparing the municipal committee of picking up biodegradable waste and transporting the same to disposable sites.</p> <p>(b) Sita is producing her own compost for her home garden. She is not only saving money on purchase of manure and fertilizer but is also practicing organic farming.</p> <p>(c) Lata's practice of keeping two separate bins of bio-degradable and non-biodegradable garbage is most suitable but Sita's practice is better as it reduces the bulk of garbage and saves on money.</p>
30.	<p>Biodegradable and non-biodegradable wastes should be discarded in two separate bins because of their effective treatment and disposal. The separation of these wastes must be done at the source only. This will help in preventing environmental pollution.</p>
31.	<p>It is a structural & functional unit of the biosphere consisting of living beings & the physical environment, which interact with each other & maintain a balance in nature.</p>
32.	<p>Refer Answer no. 25</p>

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