**BIOLOGY**
**OUR ENVIRONMENT**
**WORK SHEET-1**

**Ia. Multiple choice questions:**

1. Only_____% of energy is transferred from one trophic level to the next.
   a) 1% b) 10% c) 100% d) 1000%
2. Soil fertility is determined by its ability to:

   a) Decay organic matter b) Hold organic matter

   c) Support life d) Hold water

3. If grass is eaten by grasshopper, then the energy transfer will be from

   a) producer to decomposer b) producer to primary consumer

   c) primary consumer to secondary consumer d) secondary consumer to primary consumer

4. Accumulation of non-biodegradable pesticides in different trophic levels:

   a) Biological degradation b) Biological magnification

   c) Biological decomposition d) Biological concentration

5. Which of the following is the best way for disposal of vegetable peels from your kitchen?

   a) Landfill b) Recycling c) Composting d) Burning

6. Organisms which make food in the form of carbohydrates from inorganic compounds using sunlight energy is called
   a) decomposers b) producers c) herbivores d) carnivores

7. In a food chain the second trophic level is occupied by:

   a) Carnivores b) Autotrophs c) Herbivores d) Producers

8. Which of the following are ecofriendly practices?

a) Carrying Jute and cloth bags for shopping

b) Walking or riding a bicycle to school instead of being dropped by car to school

c) Switching off lights, fans, A C, when not in use.

d) All the above are ecofriendly practices

**Ib. ASSERTION AND REASONING:**

For the questions 11to 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.

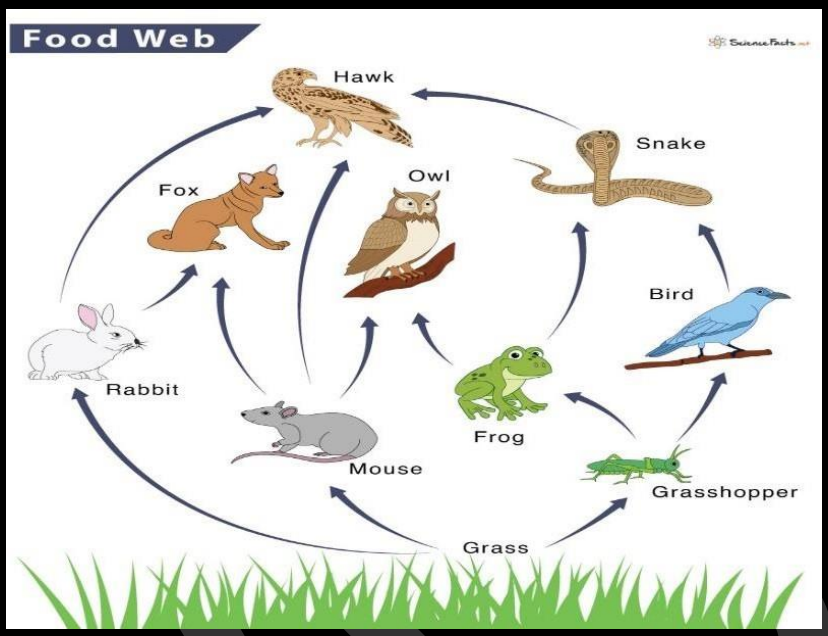
9. **Assertion:** Grasshoppers of the crop field ecosystem are the producers.
**Reason:** Producers trap the radiant energy of the sun and change it into chemical energy to make glucose.

10. **Assertion**: The flow of energy in an ecosystem is unidirectional
**Reason:** Energy captured by the autotrophs gets reverted back to the solar input and it passes through various trophic levels.

11. **Assertion**: Animals adopt different strategies to survive in hostile environment.
**Reason:** The chameleon changes its skin colour to camouflage and merge with its surroundings.

12. **Assertion**: Forests are natural ecosystems.
**Reason:** Forests are source of raw materials for many industries.

**13. Ic. CASE-BASED/DATA - BASED QUESTIONS:**
Read the following and answer the questions any four from (i) to (iv)
A food chain is a linear network of links in a food web starting from producer organisms and ending at an apex predator species, detritivores, or decomposer species. A food chain also shows how organisms are related to each other by the food they eat. Each level of a food chain represents a different trophic level.
Food chains are very important for the survival of most species.




13.1 If 40,000 J solar energy falls on producers in a grassland ecosystem, what percentage of solar energy will be converted into food energy?

13.2 If Tim is consuming curd/yogurt for dinner, which trophic level in a food chain he should be considered as occupying?

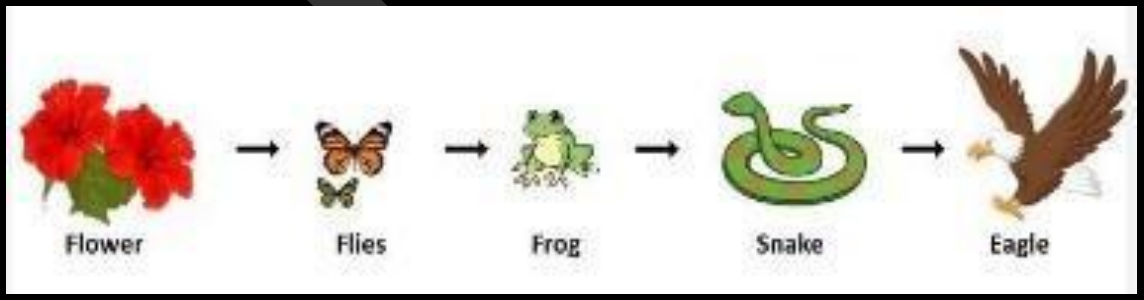
13.3 Matter and energy are two fundamental inputs of an ecosystem. How is the movement of energy and matter in an ecosystem?

OR

What limits the number of trophic levels in a food chain?

**II.VERY SHORT QUESTIONS CARRYING 02 MARKS EACH. ANSWERS TO THESE QUESTIONS SHOULD BE IN THE RANGE OF 30 TO 50 WORDS.**

14. Study the food chain given below and answer the questions that follow:




a) If the amount of energy available at the third trophic level is 300 joules, then how much energy will be available at the producer level? Justify your answer.

b) Is it possible to have 2 more trophic levels in this food chain just before the fourth trophic level? Justify your answer.

15. What are the advantages of cloth or jute bags over plastic bags when we go for shopping?

16. Which of the following will have maximum concentration of harmful chemicals in its body? Justify your answer


17. Give any two ways in which biodegradable substances would affect the environment.

**III. <u>SHORT ANSWER TYPE QUESTIONS CARRYING 3 MARKS EACH</u>**

18. State in brief the two ways in which non-biodegradable substances would affect the environment. List two methods of safe disposable of the non-biodegradable waste.

19. "The Ozone layer damage is a major cause of concern." Justify the statement, suggesting any two steps to limit this damage of Ozone layer.

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

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

22. "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.

**IV. <u>LONG ANSWER TYPE QUESTIONS CARRYING 5 MARKS EACH</u>**

23. Give reason to justify the following:
(a) The decomposers play a vital role in the biosphere.
(b) Flow of energy is always unidirectional in a food chain.

24. A team of Indian researchers went to Antarctica to study the ozone layer. They confirmed the presence of largest ozone hole over Antarctica and was just short of 27 million sq. km. After few days of their return, one of the scientists developed rashes, burning sensation and other skin problems which, the doctors have confirmed as skin cancer.
(a) What may be the cause of cancer just after return from Antarctica?
(b) What do we learn from this incident?

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

**V. BOARD BASED QUESTIONS.**

26. Why should biodegradable & non-biodegradable wastes be discarded in two different dustbins? (1)

27. What is an ecosystem? (1)

28. What are decomposers? State the role of decomposers in the environment. (2)

29. Kulhads (disposable cups made of clay) and disposable paper cups both are used as an alternative for disposable plastic cups. Which one of these two can be considered as a better alternative to plastic cups and why? (2) 2022

30. Human beings are most adversely affected by the Biological Magnification. State the reason. Why can ordinary washing of edibles (fruits and vegetables) not reduce the effect of biological magnification? (2) 2022

31. How do harmful chemicals get accumulated progressively at each trophic level in a food chain? (2) (2023)

## ANSWERS

Ia. **Multiple choice questions:**

1. b) 10%
2. c) Support life
3. b) producer to primary consumer
4. b) Biological magnification
5. c) Composting
6. b) producers
7. c) Herbivores
8. d) All the above are ecofriendly practices

Ib. **ASSERTION AND REASONING**

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

**Ic. CASE-BASED/DATA - BASED QUESTIONS:**

13.1 b) 400 J
13.2 c) Third trophic level
13.3 c) Energy is unidirectional and matter is repeatedly circulating.

**OR** a) Decrease in energy at higher trophic levels

**II.VERY SHORT QUESTIONS CARRYING 02 MARKS EACH.**

14. a) 30000J
    b) No
15. i. Reusable
    ii. Non-polluting
    iii. Biodegradable
    iv. Stronger and capable taking more load
16. Dolphins
    Reason biomagnification
17. i. Foul smell during decomposition
    ii. Produce gases like methane, etc. which further cause global warming

**III. SHORT ANSWER TYPE QUESTIONS CARRYING 3 MARKS EACH**

18. i. accumulates in the environment, concentrate in the food chain, harm organisms.
    ii. pollute soil, increase soil temperature
    Methods of safe disposal of biodegradable waste –
    i. Recycling - elaborate
    ii. Incineration – burning medical and toxic wastes at high temperature in incinerators transforming into ash
19. **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.
    Steps to Limit Damage -

    1. Ban on production and use of halons.
    2. Ban on production and use of chlorofluorocarbons.

20. Pesticides are the chemicals used to kill plant and animal pests. They are non-biodegradable and toxicants. For example, excessive use of DDT resulted in reduced population of fish-eating birds. DDT accumulated in such birds through the food chain. It interfered with the egg shell formation. The shell being thin broke due to weight of the bird during incubation. Hence, their population declined.
21. (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.
    **(b) Advantages:**

    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.

22. . "Energy flow in a food chain is unidirectional." In the ecosystem energy flows from one trophic level to the next trophic level of the food chain. Energy flows from producers i.e., green plants to the consumers. It does not flow from the last consumer to its previous consumer and so on. Thus, the energy does not flow back from consumers to the producers. So, we say that flow of energy in an ecosystem is unidirectional.
Entry of pesticides in a food chain: Some harmful chemicals like pesticides, when absorbed by the plants through soil and water, get transferred from first trophic to the last trophic level of the food chain. As these chemicals are non-degradable, their concentration in the bodies of living organisms at each trophic level progressively increases. Their increase in the concentration of harmful chemicals in the body of living organisms at each trophic level of a food chain is called biological magnification. The level of concentration of chemicals is maximum for human beings as they are at the highest trophic level.

## IV. LONG ANSWER TYPE QUESTIONS CARRYING 5 MARKS EACH

23. (a) Decomposers break down complex organic substances (dead remains and waste products of organisms) into simpler inorganic substances that can be absorbed by the plants. They are essential for the proper functioning of an ecosystem.
Decomposers play an important role in the cycling of materials in the biosphere.
By decomposing dead bodies of plants and animals they help in cleaning the environment. They replenish the soil naturally.
(b) In the ecosystem energy flows from one trophic level to the next trophic level of the food chain. Energy flows from producers, i.e., green plants to the consumers. It does not flow from the last consumers to its previous consumers and so on. The energy captured by the autotrophs does not go back to the solar input. Thus, the energy does not flow back from consumers to the producers. Hence the flow of energy in a food chain is unidirectional.

24. (a) The scientists were exposed to harmful UV-radiations of the sunlight as there was a big hole over Antarctica and this might be the cause of skin cancer. The ozone layer acts as an ozone shield and absorbs the harmful UV-radiations. The UV-radiations have extremely harmful effects on human beings, animals as well as plants.
(b) We learn that the ozone layer is very important for the existence and survival of life on earth. Ozone layer absorbs high energy UV-radiations causing a rise in temperature of the stratosphere. The use of chemicals like CFCs has endangered the ozone layer. CFCs used as refrigerator coolants rise to the stratosphere where these molecules are broken down by UV-rays resulting in attack on the ozone molecules damaging the ozone umbrella of earth.
Due to ozone layer depletion UV-rays reaching the earth cause skin cancer, cataracts, damage immune system, etc. UV-rays also decreases crop yield and certain fish larvae which are important constituents of aquatic food chains. It may also disturb global rainfall causing ecological disturbance. In this way all on the earth would be destroyed gradually.

25. (a) Rack. He is sparing the municipal committee of picking up biodegradable waste and transporting the same to disposable sites.
(b) Rack is producing her own compost for her home garden. He is not only saving money

on purchase of manure and fertilizer but is also practicing organic farming.
(c) Jack's practice of keeping two separate bins of bio-degradable and non-biodegradable garbage is most suitable but Rack's practice is better as it reduces the bulk of garbage and saves on money.

**V. BOARD BASED OUESTIONS**

26. 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.
27. 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.
28. Decomposers are organisms that break down dead or decaying organisms
    i. role in the flow of energy through an ecosystem.
    ii. They break apart dead organisms into simpler inorganic materials, making nutrients available to primary producers.
29. Making Kulhad made of clay on a large scale resulted in the loss of fertile top soil. Now, **disposable paper cups are used because the paper can be recycled, it is biodegradable and is eco-friendly material which does not cause harm to the environment**.
30. Biomagnification **makes humans more prone to cancer, kidney problems, liver failure, birth defects, respiratory disorders, and heart diseases**.
    Ordinary washing of edibles (fruits and vegetables) does not reduce the effect of biological magnification because **there is concentration of harmful chemicals (say pesticides) in them when we sprayed this harmful chemical over the plants to protect them from pests and insects**.
31. Biomagnification is the process by which a harmful chemical enters the food chain and gets concentrated at each trophic level.