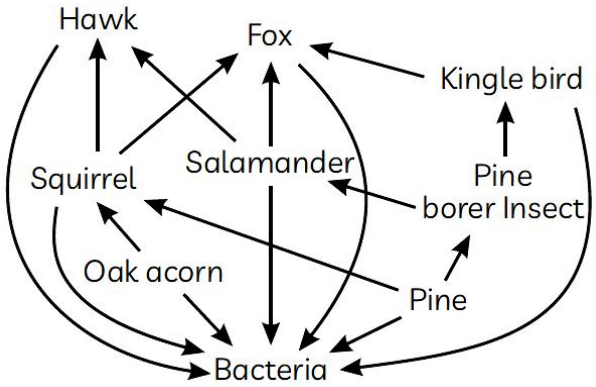
SCIENCE
WORKSHEET_050225
CHAPTER 13 OUR ENVIRONMENT

SUBJECT: SCIENCE **MAX. MARKS : 40**
CLASS : X **DURATION : 1½ hrs**

General Instructions:
(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). Use of Calculators is not permitted

SECTION – A
Questions 1 to 10 carry 1 mark each.

1. According to the image showing a food web:



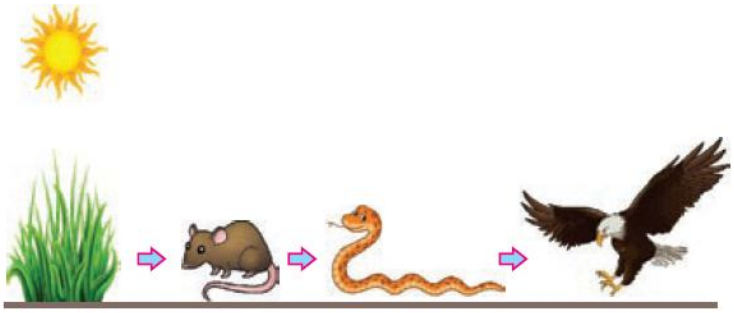
(a) Fox feeds on hawk to obtain energy.
(b) Hawk feeds on oak acorn to obtain energy.
(c) Squirrel feeds on pine borer to obtain energy.
(d) Salamander feeds on pine borer to obtain energy.

2. Disposable plastic plates should not be used because:
(a) they are made of materials with light weight.
(b) they are durable.
(c) they are made of biodegradable materials.
(d) they are made of non-biodegradable materials.

3. In the given food chain, suppose the amount of energy at fourth trophic level is 5 kJ, what will be the energy available at the producer level?
Grass → Grasshopper → Frog → Snake → Hawk
(a) 5 kJ (b) 50 kJ (c) 500 kJ (d) 5,000 kJ

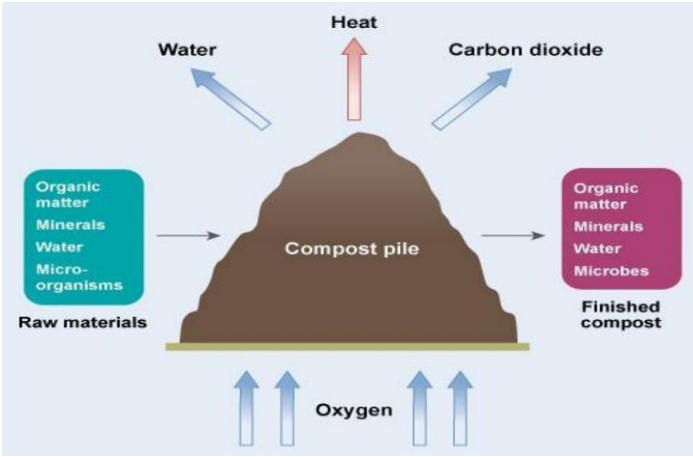
4. In 1987, an agreement was formulated by the United Nations Environment Programme (UNEP) to freeze the production of "X" to prevent depletion of "Y". "X" and "Y" respectively referred here are:
(a) Ozone; CFCs (b) CFCs; rays UV
(c) CFCs; Ozone (d) UV rays; Diatomic oxygen

5. Which of these statements would be correct if the population of snakes is greatly increased?



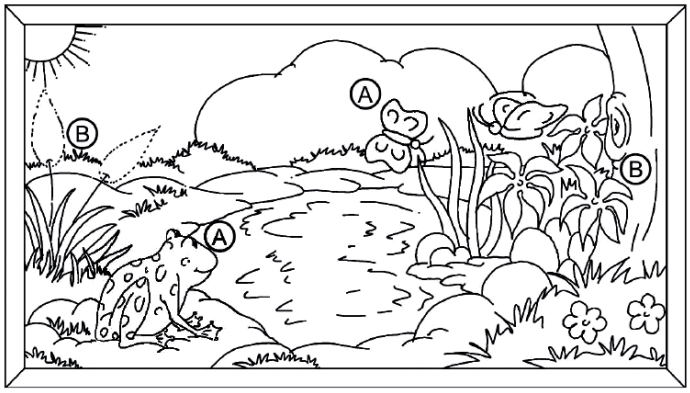
(a) Population of green plants will decrease.
(b) Population of mice will decrease.
(c) Population of snakes will decrease.
(d) Population of hawk will decrease. Ap

6. Composting is the process where organic wastes are degraded into compost. The diagram shows the details of the process.



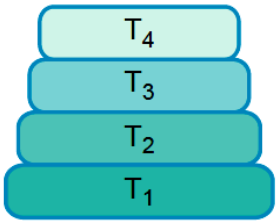
What can be concluded from the diagram?
(a) Composting helps in recycling plastic scraps.
(b) Composting absorbs heat from the environment.
(c) Composting takes place only in the presence of oxygen.
(d) Composting takes place in the presence of either oxygen or carbon dioxide.

7. An ecosystem is represented in the figure given above. This ecosystem will be selfsustaining if



(a) the type of organisms represented by B are eliminated.
(b) materials cycle between the organisms labelled A and the organisms labelled B.
(c) the organisms labelled A outnumber the organisms labelled B.
(d) the organisms labelled A are equal in number to the organisms labelled B.

8. In the given figure alongside the various trophic levels are shown in a pyramid. At which trophic level is maximum energy available?



(a) T_4 (b) T_2 (c) T_1 (d) T_3

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

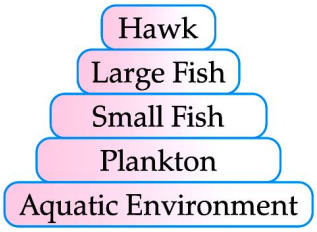
9. **Assertion (A):** Food chain is responsible for the entry of harmful chemicals in our bodies.
Reason (R): The length and complexity of food chains vary greatly.

10. **Assertion (A):** Omnivores receive 10% of their energy from the trophic level below them.
Reason (R): An omnivore is always in the trophic level just above herbivores.

SECTION – B

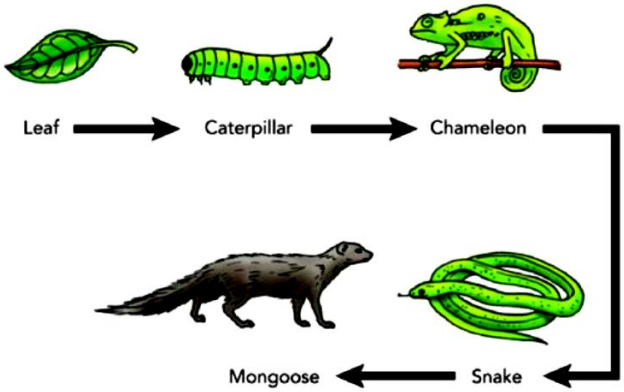
Questions 11 to 14 carry 2 marks each.

11. DDT was sprayed in a lake to regulate breeding of mosquitoes. How would it affect the trophic levels in the following food chain associated with a lake? Justify your answer.



OR

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 100 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.

12. How does improper disposal of biodegradable substances would affect the environment?

OR

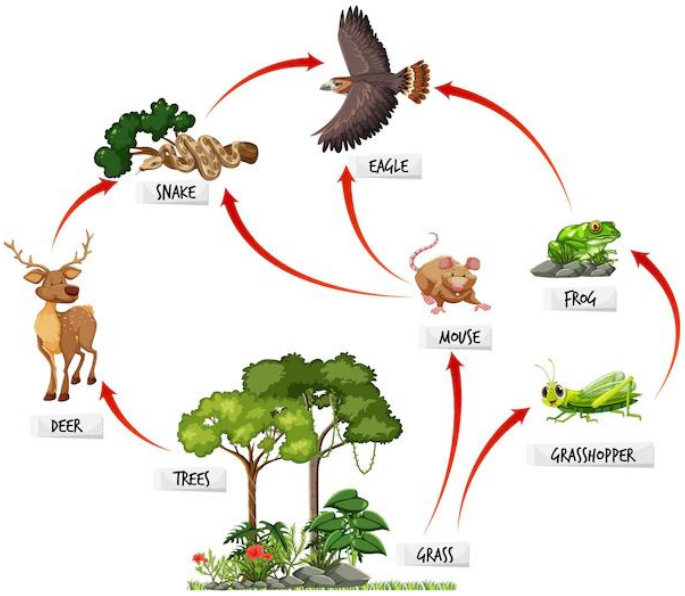
Why should biodegradable and nonbiodegradable wastes be discarded in two different dustbins?

13. Give two examples of decomposers. State their important role in nature.

14. (i) Create a terrestrial food chain depicting four trophic levels.
(ii) Why do we not find food chains of more than four trophic levels in nature?

OR

Study the food web shown below.



(a) Identify and write the food chain from the food web shown, in which the eagle will receive the highest percentage of the energy from the producers.
(b) Which organism will be the most affected when a non-biodegradable pesticide is introduced into the soil? What is the phenomenon responsible for this called?

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Plastic cups were used to serve tea in trains in early days- these could be returned to the vendors, cleaned and reused. Later, Kulhads were used instead of plastic cups. Now, paper cups are used for serving tea. What are the reasons for the shift from Plastic to Kulhads and then finally to paper cups?

16. (a) Explain the role of UV radiation in producing ozone layer.
(b) Mention the reaction involved.
(c) Why is excessive use of CFCs a cause of concern?

OR

(a) Construct a food chain of four trophic levels comprising the following:
Hawk, snake, plants, rat.
(b) 20,000 J of energy was transferred by the producers to the organism of second trophic level. Calculate the amount of energy that will be transferred by organisms of the third trophic level to the organisms of the fourth trophic level.

17. What is trophic level? Why are autotrophs considered to be at the first trophic level of all food chains? State the reason for limited number of trophic levels in nature.

OR

How can we help in reducing the problem of waste disposal? Suggest any three methods.

SECTION – D

Questions 18 carry 5 marks.

18. How is ozone formed in the higher levels of the atmosphere? Why is damage to the ozone layer a cause for concern? What are its causes and what steps are being taken to limit this damage? Write one harmful effect of ozone depletion.

OR

(a) Why does a kitchen garden called an artificial ecosystem while a forest is considered to be a natural ecosystem?

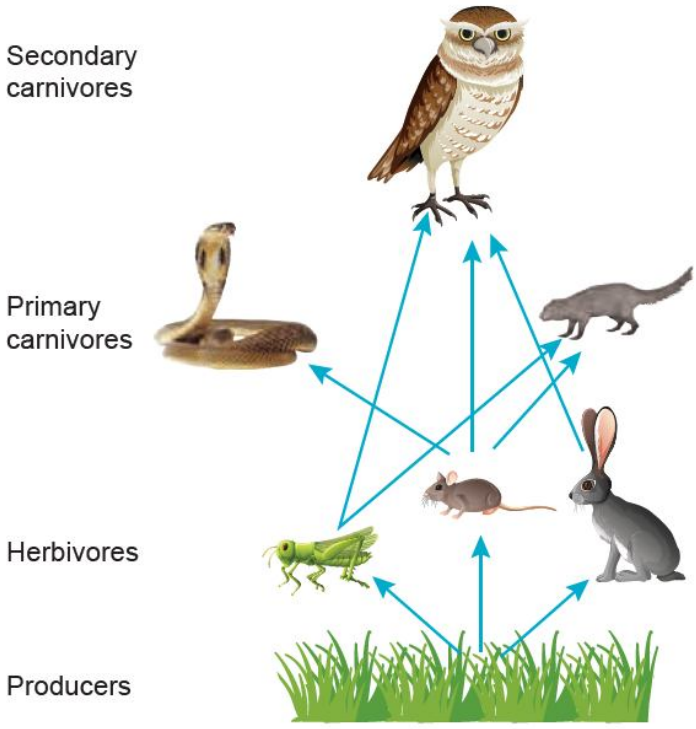
(b) While designing an artificial ecosystem at home, write any two things to be kept in mind to convert it into a self-sustaining system. Give reason to justify your answer.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Food chains are very important for the survival of most species. When only one element is removed from the food chain it can result in extinction of a species in some cases. The foundation of the food chain consists of primary producers.

Primary producers, or autotrophs, can use either solar energy or chemical energy to create complex organic compounds, whereas species at higher trophic levels cannot and so must consume producers or other life that itself consumes producers. Because the sun's light is necessary for photosynthesis, most life could not exist if the sun disappeared. Even so, it has recently been discovered that there are some forms of life, chemotrophs, that appear to gain all their metabolic energy from chemosythesis driven by hydrothermal vents, thus showing that some life may not require solar energy to thrive.



Food Web

(a) If 10,000J of solar energy falls on green plants in a terrestrial ecosystem, what percentage of solar energy will be converted into food energy?

(b) In which trophic level, do rats fall in this food chain?

(c) (i) If 10J of energy is available to snake, how much energy will be available from snake to owl?

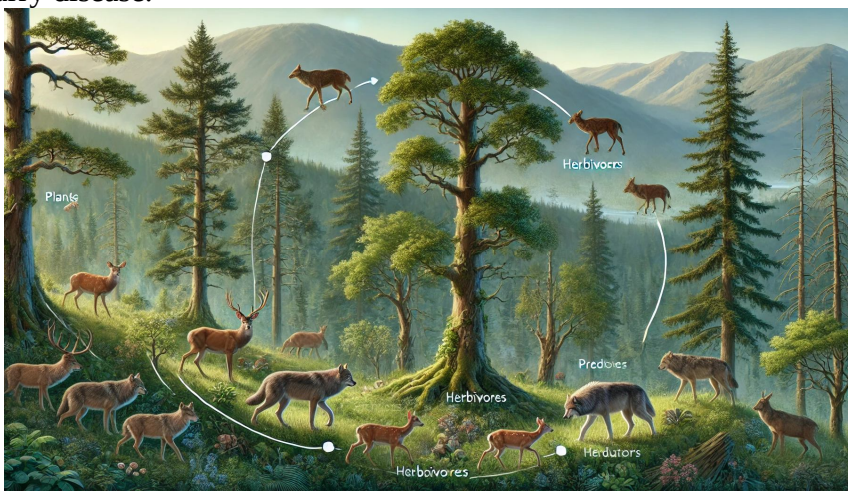
(ii) Mr. X is eating curd/yogurt. For this food intake in a food chain, in which level he should be considered as occupying?

OR

(c) Why do the number of trophic levels is limited to 3 or 4?

20. Every living thing plays a role in the food chain and Earth's ecosystems, and the extinction of certain species, whether predators or prey, can leave behind significant impacts. Since the origin of life on Earth, it's fair to say that more species have gone extinct than are currently alive now. Extinction itself is part of the normal course of evolution. The effect of a species would have if it

were to fade from existence depends largely on its role in the ecosystem. Predators, for example, are often the first to be threatened by hunting or competition with people and resources. When a predator goes extinct, all of its prey are released from that predation pressure, and they may have big impacts on ecosystems. The loss of a predator can result in what is called a trophic cascade, which is an ecological phenomenon triggered by a predator's extinction that can also impact populations of prey, which can cause dramatic ecosystem and food web changes. If there are too many deer, for example, they can really change the ecosystem because they can destroy forests, and they also carry disease.



(a) What is an ecosystem?
(b) List two man-made ecosystems.
(c) What will be the impact if all the organisms of one trophic level die? Give any one effect.

OR

(c) Justify the statement; 'All the flesh of a carnivore is grass'.