



CLASS: VII	DEPARTMENT: SCIENCE 2024-2025	DATE: 22-04-2024
WORKSHEET NO: 1 WITH ANSWERS	TOPIC: NUTRITION IN PLANTS	Note: A4 FILE FORMAT
NAME OF THE STUDENT:	CLASS & SEC:	ROLL NO.

### I. OBJECTIVE TYPE QUESTIONS

1. How does photosynthesis help to maintain the percentage of oxygen and carbon dioxide in the atmosphere?

a. By giving off carbon dioxide and absorbing oxygen.

**b. By giving off oxygen and absorbing carbon dioxide.**

c. By releasing oxygen and carbon dioxide.

d. By absorbing oxygen and carbon dioxide.

2. Which of the following is the characteristic feature of organisms exhibiting symbiosis?

a. Organisms feed on dead and decaying organic matter.

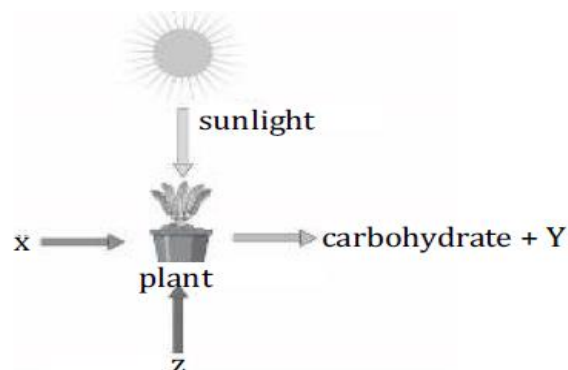
b. Organisms trap and feed on insects.

**c. Two organisms live together and benefit from each other.**

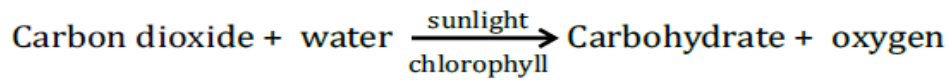
d. One organism grows as a parasite on the body of another.

3. The picture below shows the process through which green plants make their food.

X, Y and Z are three different components of the process. The direction of the arrows shows what is absorbed and what is released by the plant. For example, sunlight is absorbed by the plant.



The equation given below shows how green plants make their food.



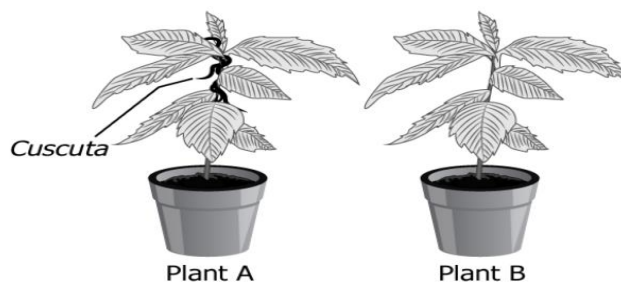
What do X, Y and Z represent in the picture above?

	X	Y	Z
a.	<b>Carbon dioxide</b>	<b>Oxygen</b>	<b>Water</b>
b.	Oxygen	Water	Carbon dioxide
c.	Water	Carbon dioxide	Oxygen
d.	Carbon dioxide	Water	Oxygen

4. Which part of the leaf controls the exchange of gases?

- a. Midrib
- b. Stomata**
- c. Petiole
- d. Veins

5. *Cuscuta* is a yellow wiry branched structure that climbs on other plants as it lacks chlorophyll. A student sets up an experiment using two potted plants, one with *Cuscuta* and others without it as shown.



Which of these plants will show more growth?

- a. Plant A, as *Cuscuta* provides valuable nutrients to host plants for photosynthesis.
- b. Plant B, as *Cuscuta* shares the chlorophyll of the host plants to synthesise its food.
- c. Plant B, as *Cuscuta* uses readymade food of plant A that weakens the host plant.**
- d. Plant A, as *Cuscuta* shares its readymade food with host plants to increase their combined growth.

6. Take a potted plant put it in a cardboard box and close the box. Make a hole on one side of the cardboard box in such a way that light enters only through this hole. Keep watering the plant regularly for a few days then which of the following statements is correct?

a. The plant would grow upright because it is getting all the essential requirements for its growth.

**b. The plant would bend towards the hole because the plant responds to light.**

c. The plant would grow upright because it is getting direct sunlight.

d. The plant would bend towards the hole because it has to exchange gases through the hole.

*For question numbers 7-10, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (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.**

7. **Assertion (A):** Mushrooms are saprotrophs.

**Reason (R):** Mushrooms take nutrients from dead and decaying matter.

**Ans: i. Both A and R are true and R is the correct explanation of the assertion.**

8. **Assertion (A):** Lichens are a symbiotic association of algae and fungi.

**Reason (R):** The fungus supplies food to the algae and, in return, the algae supply water and minerals to the fungus.

**Ans: iii. A is true but R is false.**

9. **Assertion (A):** All plants are autotrophic

**Reason (R):** Non-green plants lack chlorophyll.

**Ans: iv. A is false but R is true.**

10. **Assertion (A):** Plants convert light energy into chemical energy during the process of photosynthesis.

**Reason (R):** Chlorophyll traps sunlight for photosynthesis.

**Ans. ii) Both A and R are true but R is not the correct explanation of the assertion.**

## **II. VERY SHORT ANSWER TYPE QUESTIONS (2 M):**

1. Explain the structure of a cell. **[Hint- The units which constitute the bodies of living organisms are called cells. The cell is enclosed by a thin outer boundary, called the cell membrane. Most cells have a distinct, centrally located spherical structure called the nucleus. The nucleus is surrounded by a jelly-like substance called cytoplasm.]**

2. Why do humans lack the ability to generate food through photosynthesis? Are humans autotrophs or heterotrophs?

**[Hint: Humans cannot perform photosynthesis because they don't have chlorophyll inside their bodies. Humans are heterotrophs]**

3. Farmers spread manure or fertilisers in the fields or gardens, etc. Why are these added to the soil? **[Hint: As plants absorb mineral nutrients from the soil, their amounts in the soil keep on declining. Fertilisers and manures contain plant nutrients such as nitrogen, potassium, phosphorus, etc. which need to be added from time to time to enrich the soil.]**

4. What do stomata do for plants, and how do they help the plant stay healthy? Name the cells that control the opening and closing of the stomata. **[Hint: Stomata are the numerous small openings present on the lower surface of a leaf. The stomata help in the exchange of gases, carbon dioxide goes in and oxygen is released. Guard cells help in controlling the opening and closing of stomata for gaseous exchange.]**

5. Justify- "Fungi can be useful as well as harmful." **[Hint: Many fungi like yeast and mushrooms are useful. Mushroom is eaten as vegetables and yeast is used in baking. Some fungi can cause diseases in crops and humans.]**

## **III. SHORT ANSWER TYPE QUESTIONS (3 M):**

1. Give a reason for the following statements-

a. Sun is the ultimate source of energy for all living organisms.

**[Hint: Plants convert light energy from the sun into chemical energy (food) by the process of photosynthesis. All animals directly or indirectly depend on plants for their food.]**

b. Cuscuta is categorised as a parasite. **[Hint- Cuscuta doesn't have chlorophyll. It takes readymade food from the plant on which it climbs. It deprives its host of valuable nutrients.]**

c. Mushroom cannot prepare its own food. **[Hint- No chlorophyll is present.]**

2. What would happen in the absence of photosynthesis? **[Hint: There would be no plants, In the absence of plants, survival of other living organisms would not be possible as they are directly or indirectly dependent on the food made by the plants, Oxygen would not be released in the atmosphere; oxygen is essential for the survival of all living organisms.]**

3. A farmer grew rice in one season and beans in the next season on the same field. He found that he did not have to add nitrogen fertiliser to the soil. How do you think this happened?

**[Hint- Beans is a leguminous plant. Rhizobium bacteria grow in the roots of leguminous plants. It converts atmospheric nitrogen into a soluble form. Thus, the soil is enriched with nitrogen minerals.]**

4. Two potted green plants A and B of the same kind were taken to experiment. Plant A was kept in a dark room, while Plant B was kept in sunlight for 3–4 days. A leaf from each plant was taken to perform the iodine test. Which of the leaves turned blue-black in colour and why?

**[Hint- Plant B - It performed photosynthesis in the presence of sunlight and starch was formed. This starch showed a blue-black colour with iodine. Plant A did not perform photosynthesis in the absence of sunlight and no starch was formed.]**

5. How do fungi and algae in lichens benefit each other? What is their relationship called?

**[Hint: Some organisms live together to share shelter and food. These are said to have a symbiotic relationship. Lichen is an association between algae and fungi. Algae contains chlorophyll and provides food and nutrition to the fungus. While the fungus provides water, minerals and shelter to the algae.]**

6. Wild animals like tigers, wolves, lions and leopards do not eat plants. Does this mean that they can survive without plants? Can you provide a suitable explanation?

**[Hint: Animals like tigers, wolves, lions and leopards are carnivorous and do not eat plants. They hunt and eat herbivorous animals like deer, giraffes, etc., which are dependent on plants for food. If there are no plants, herbivorous animals will not be able to survive as they will have no food. This will ultimately affect carnivorous animals. They will have nothing to eat and thus will not survive.]**

#### **IV. LONG ANSWER TYPE QUESTIONS (5 M):**

1. Explain how pitcher plants get their nutrition.

**[Hint: The pitcher plant is green and carries out photosynthesis. The nitrogen requirement of Pitcher plants is provided by the insects which these plants capture. Pitcher plants have a pitcher-like structure which is a modified part of the leaf. The apex of the leaf forms a lid which can open or close the mouth of the pitcher. When an insect lands in the pitcher, the lid closes and the trapped insect gets entangled into the hair inside the pitcher. The insect is digested by the digestive juices secreted in the pitcher.]**

2. a. Explain the symbiotic association found in rhizobium bacteria and legumes.

**[Hint: *Rhizobium* bacteria are present in the soil and can convert nitrogen present in the air into a soluble form that can be consumed by the plants. But *Rhizobium* cannot make its food. It generally lives in the roots of plants such as peas, beans and legumes and provides nitrogen to these plants. In return, the plants provide food and shelter to the bacteria. This is an example of a symbiotic relationship.]**

b. Why do certain crops require a lot of nitrogen? **[Hint: Certain crops require a lot of nitrogen to make proteins]**

c. Can plants use nitrogen in the manner they use carbon dioxide? **[Hint: The plants cannot use nitrogen in the manner they use carbon dioxide. They need nitrogen in soluble form.]**

#### **V. SOURCE-BASED/ CASE STUDY-BASED QUESTIONS**

In a food chain, saprotrophs generally play the role of decomposers. They have different modes of nutrition. They secrete digestive juices on the dead and decaying matter and convert it into a solution. Then they absorb the nutrients from it. This mode of nutrition in which organisms take in nutrients in solution form from dead and decaying matter is called saprotrophic nutrition. Plants which use saprotrophic modes of nutrition are called saprotrophs. Fungi also grow on pickles, leather, clothes and other articles that are left in hot and humid weather for a long time. You may have also seen fluffy umbrella-like patches growing on rotting bread. A saprotroph is an organism that obtains its nutrients from non-living organic matter, usually dead and decaying plant or animal matter, by absorbing soluble organic compounds. Since saprotrophs consume external food sources rather than make their food, they are considered a type of heterotroph. Examples of saprotrophs are mushrooms, yeast and other fungi.

i. What role do saprotrophs play in a food chain? **[Hint- In a food chain, saprotrophs generally play the role of decomposers]**

ii. How do saprotrophs obtain nutrients, and what is this mode of nutrition called? **[Hint- They secrete digestive juices on the dead and decaying matter and convert it into a solution.]**

**Then they absorb the nutrients from it. This mode of nutrition in which organisms take in nutrients in solution form from dead and decaying matter is called saprotrophic nutrition.]**

iii. What are the examples of articles where saprotrophs, such as fungi, can grow? **[Hint- Pickles, leather, clothes]**

iv. Can you describe the environmental conditions under which fungi, as saprotrophs, thrive? **[Hint- hot and humid weather]**

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