Class 7th Living science solution 2017-18
Chapter- 01. Nutrition in plants

P. 10 Oral Questions For Formative Assessment

1. The new organism will be classified as an autotroph. This is because only green plants or autotrophs can make food from simple non-living substances, that are carbon dioxide and water.

2. The absence of oxygen will not affect photosynthesis. In photosynthesis, carbon dioxide and water combine in the presence of chlorophyll and sunlight to form glucose (food) and oxygen. So, oxygen is released in the process and hence not needed in photosynthesis.

3. Yes, the intensity of light will affect the rate of photosynthesis.

P. 13 Oral Questions For Formative Assessment

1. No, the statement is not true. A tiger does not eat plants but it does depend on plants for food. A tiger eat herbivores which in turn eat plants. Thus, a tiger indirectly depends on food prepared by plants.

2. All plants are not autotrophic. Non-green plants cannot prepare their own food as they do not have chlorophyll.

3. No, I do not agree with this statement that after sometime the nutrient level of the soil in a forest becomes so low that growth of trees will suffer. Because, in a forest the nutrients in the soil get naturally replenished by decaying of dead plants and animals.

4. No, the plants cannot absorb nitrogen from the atmosphere. They get it in a soluble form from the soil.

P. 13 For Formative and Summative Assessment

A. 1. c 2. b 3.d 4.a 5. c 6. d 7. a 8. b

B. 1. heterotrophs 2. chloroplasts 3. light 4. Rhizobium 5. plant parasite
6. symbiosis 7. saprotrophs, for example, fungi 8. blue-black 9. sun or solar energy
10. false 11. true 12. guard cells

C.

1. The process of taking in food by an organism and its utilization by the body is called nutrition.

2. Stomata are tiny pores through which leaves take in carbon dioxide from the air. Stomata are found on the underside of the leaves.

3. Carbon dioxide + Water $\xrightarrow[\text{Sunlight}]{\text{Chlorophyll}}$ Glucose + Oxygen

4. Water, carbon dioxide, chlorophyll and sunlight are essential for photosynthesis to take place. In photosynthesis, carbon dioxide and water combine in the presence of chlorophyll and sunlight to form glucose and oxygen.

5. The cells of an insectivorous plant secrete digestive juices to absorb nutrients from an insect trapped by it.

6. Nitrogenous fertilizer is not added in soil in which leguminous plants are grown. This is so because farmers know that leguminous plants like gram, peas contain Rhizobium bacteria in their roots which convert atmospheric nitrogen into a soluble form that the plants can absorb.

7. Saprophyte like a mushroom secretes digestive juice on the dead and decaying matter. This juice converts the solid matter into a liquid. The saprophyte then absorbs the nutrients from this liquid.

D. 1. Autotrophs: The organisms which can make their food from simple non-living substances are called autotrophs. Examples: green plants and Sulphur bacteria. Heterotrophs: The organisms which can not make their own food, and depend on green plants for their nutrition directly or indirectly are called heterotrophs. Examples: animals and non-green plants.

2. To test a leaf for starch: Pluck a leaf from a plant that has been exposed to sunlight.

Boil it for about five minutes in water to soften it.

Place it in a test tube containing alcohol and indirectly boil it in a water-filled beaker or water-trough.

The alcohol will dissolve the chlorophyll and the leaf will lose its green colour.

Wash the leaf in warm water to remove the alcohol. Now spread the leaf out flat on a tile and pour iodine solution on it.

Remove the leaf from the iodine and wash it with water.

Hold it up against the light.

You will observe that parts of the leaf become blue-black which proves the presence of starch in it.

Precaution: The water in the beaker should not be allowed to boil.

3. Plants get nitrogen to synthesize proteins in two ways:

a. Soil contains certain bacteria called Rhizobium that can convert atmospheric nitrogen into water-soluble compounds. Plants absorb these compounds along with water to get nitrogen.

b. Farmers add fertilizers rich in nitrogen to the soil. These are absorbed by plants.

4. All animals whether herbivores, carnivores or omnivores can not prepare their own food. They are known as heterotrophs. They depend directly or indirectly on green plants for their nutrition.

Herbivores depend directly on plants for their food. Carnivores depend on other animals, which in turn depend on plants.

Omnivores depend both on plants and herbivores for their food.

5. a. Parasitic nutrition: The mode of nutrition in which organisms live in or on other living organisms (hosts) to derive their food from them is known as parasitic nutrition. Example: dodder

b. Symbiosis: The mode of nutrition where two different organisms work together for their mutual benefit is called symbiosis. Example: Rhizobium and leguminous plants.

Rhizobium converts atmospheric nitrogen to soluble nitrogen for the host plant and the host plant in turn supplies food and shelter to Rhizobium.

c. Saprotrophic nutrition: The mode of nutrition in which organisms live on dead and decaying matter (plants and animals) to derive their food from them is known as saprotrophic nutrition. Example: mushroom

6. Plants absorb nutrients from the soil. Therefore, the amount of nutrients in the soil goes on decreasing. In a farm these nutrients have to be added to the soil in the form of manure and fertilizers. They contain plant nutrients such as nitrogen, potassium and phosphorus.

7. Parasites: Some non-green plants live in or on other living organisms to derive their food from them. These plants are known as parasites. Example: dodder.

Partial parasites: Some parasitic plants growing on other trees have green leaves and can synthesize their food. They take water and minerals from the host plants. Such plants are known as partial parasites.
Example: mistletoe plant grows on mango tree

HOTS Questions

1. Green plants are autotrophs because they synthesize their own food from simple non-living raw materials - carbon dioxide and water. We cannot be called autotrophs because the food we make in the kitchen comes directly or indirectly from the food made by plants.
2. Animals cannot make food from carbon dioxide, water and sunlight like plants do because photosynthesis requires chlorophyll also which animals do not have.
3. Pitcher plant and Venus flytrap plant grow in soil that is not so rich in nutrients. They need to feed on insects to use the nutrition obtained from insects to supplement the food they prepare by photosynthesis.
4. Plants do not need a digestive system because they do not consume complex food like us. They prepare their own simple food (glucose) which can be directly used by the plant without the need to digest it first.