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**Chapter 1**

**Nutrition in plants**

D.1. Differentiate between autotrophs and heterotrophs, giving two examples of each.

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. How will you test a leaf for starch? Mention any precautions you will take.

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. How do plants get nitrogen to synthesize proteins?

Plants get nitrogen to synthesize proteins in two ways:

* 1. 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.
  2. Farmers add fertilizers rich in nitrogen to the soil. These are absorbed by plants.

4. All animals – whether herbivores, carnivores or omnivores – depend on plants for their food. Discuss.

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.

**3**

5. Explain the following with the help of an example for each.

a. parasitic nutrition b. symbiosis c. saprotrophic nutrition

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

1. 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*.
2. 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. Why are manures and fertilizers added to the soil 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. Distinguish between parasites and partial parasites in plants,giving one example for each.

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