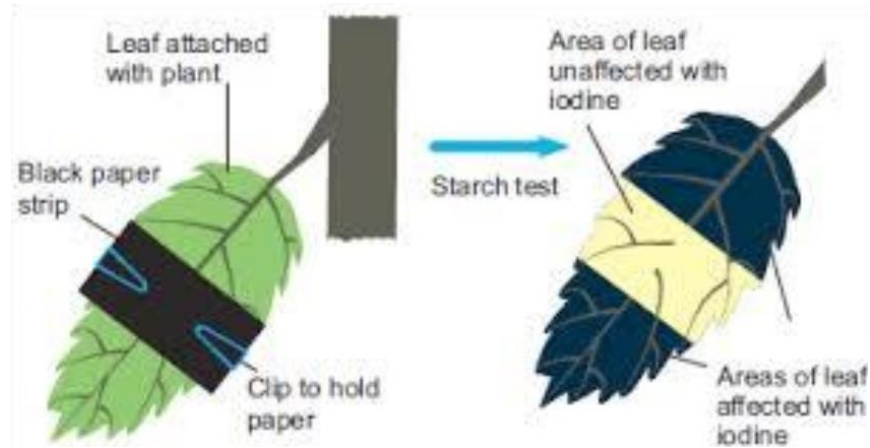


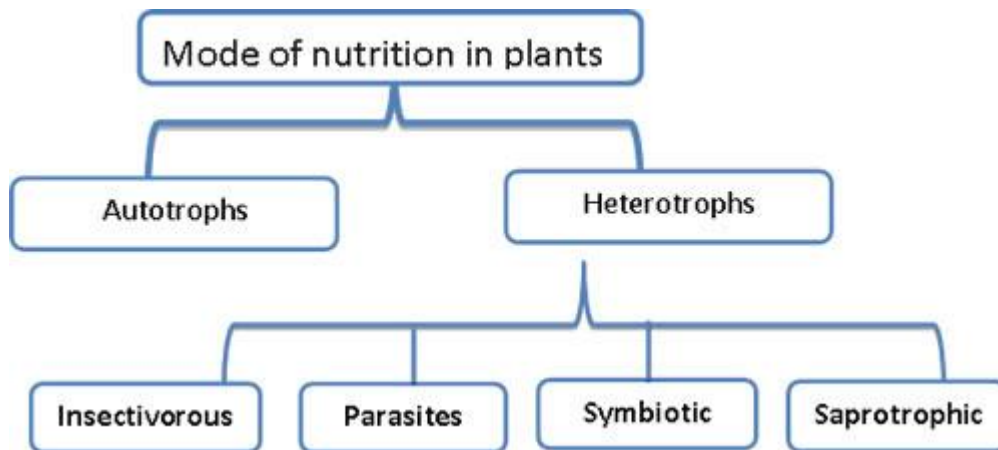
## LONG ANSWER QUESTION:

1. How would you test the presence of starch in leaves?

Take a potted plant which has been exposed to sunlight and pluck a leaf from the plant. Then boil it in water for 5 min to soften it and then place the leaf in a test tube containing alcohol, place the test tube in a beaker containing water gently heat the beaker till the alcohol dissolves in the chlorophyll and the leaves loses its green colour. Now wash the leaf with water and then place it on a plate and add a few drops of iodine solution the parts that turn blue black show the presence of starch.



2. Explain the two mode of nutrition in plants.



3. Sunlight, chlorophyll, carbon dioxide, water and minerals are raw materials essential for photosynthesis. Do you know where they are available? Fill in the blanks with the appropriate raw materials.
- (a) Available in the plant : **chlorophyll**
  - (b) Available in the soil : **water, minerals**
  - (c) Available in the air : **carbon dioxide**
  - (d) Available during day : **sunlight**

4. Explain the food making process in plants.

### STOMATA

Carbon dioxide from air is taken in through the tiny pores present on the surface of the leaves. These pores are surrounded by 'guard cells'. Such pores are called stomata. Water and minerals are transported to the leaves by the vessels which run like pipes throughout the root, the stem, the branches and the leaves. They form a continuous path or passage for the nutrients to reach the leaf.

### CHLOROPHYLL PIGMENT

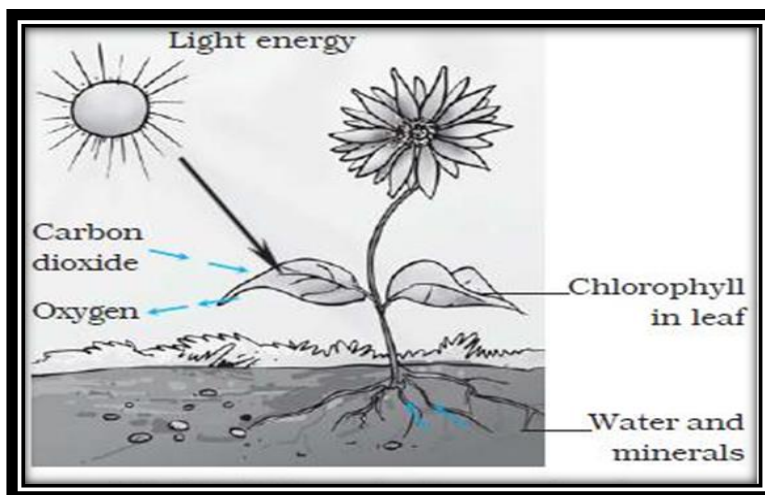
The leaves have a green pigment called chlorophyll. It helps leaves to capture the energy of the sunlight. This energy is used to synthesize (prepare) food from carbon dioxide and water. Since the synthesis of food occurs

in the presence of sunlight, it is called photosynthesis (Photo: light; synthesis: to combine). Chlorophyll, sunlight, carbon dioxide and water are necessary to carry out the process of photosynthesis. It is a unique process on the earth. The solar energy is captured by the leaves and stored in the plant in the form of food. Thus, sun is the ultimate source of energy for all living organisms. During photosynthesis, chlorophyll containing cells of leaves in the presence of sunlight, use carbon dioxide and water to synthesise carbohydrates. The process can be represented as an equation:

Carbon dioxide + water (in the presence of sun light and chlorophyll pigment) Carbohydrate oxygen



CHLOROPHYLL



5. Explain the symbiotic relationship.

Some organisms live together and share shelter and nutrients. This is called symbiotic relationship. For example, certain fungi live in the roots of trees. The tree provides nutrients to the fungus and, in return, receives help from it to take up water and nutrients from the soil. This association is very important for the tree. In organisms called lichens, a chlorophyll-containing partner, which is an alga, and a fungus live together. The fungus provides shelter, water and minerals to the alga and, in return, the alga provides food which it prepares by photosynthesis.

Usually crops require a lot of nitrogen to make proteins. After the harvest, the soil becomes deficient in nitrogen. Though nitrogen gas is available in plenty in the air, plants cannot use it in the manner they can use carbon dioxide. They need nitrogen in a soluble form. The bacterium called Rhizobium can take atmospheric nitrogen and convert it into a soluble form.

But Rhizobium cannot make its own food. So it lives in the roots of gram, peas, moong beans and other legumes and provides them with nitrogen. Most of the pulses (dals) are obtained from leguminous plants. In return, the plants provide food and shelter to the bacteria. They have a symbiotic relationship. This association is of great significance for the farmers.

