

# CHAPTER - 1

## NUTRITION IN PLANTS

### NUTRITION

The process by which an organism takes food and utilizes it is called nutrition.

### NEED OF NUTRITION

Organisms need energy to perform various activities. The energy is supplied by the nutrients. Organisms need various raw materials for growth and repair. These raw materials are provided by nutrients.

### NUTRIENTS

Materials which provide nutrition to organisms are called nutrients. Carbohydrates, proteins and fats are the main nutrients and are called macronutrients. Minerals and vitamins are required in small amounts and hence are called micronutrients. Plants make their food themselves but animals cannot. Hence, animals depend directly or indirectly on the plant.

### MODE OF NUTRITION IN PLANT

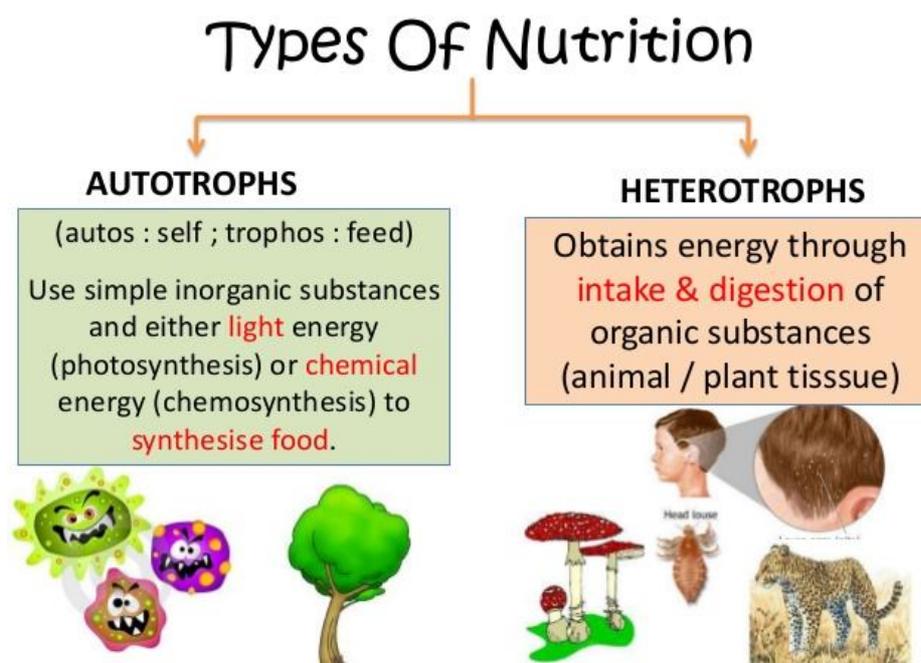
#### Autotrophic Nutrition

Auto means self and trophos means nourishment. Plants are called autotrophs because they make their food themselves. The making of food for themselves is called the Autotrophic nutrition. Autotrophic nutrition is found in green plants, and in some bacteria.

#### Heterotrophic Nutrition

The word Heterotrophic is the combination of two words i.e. Hetero + Trophos. Hetero means 'others' and 'trophos' means nourishment. If organisms depend on others for their food, such a mode of nutrition is called Heterotrophic Nutrition.

Animals cannot make their food themselves. They depend for food upon plants. Therefore, nutrition in animals is called Heterotrophic Nutrition. Animals are known as Heterotrophs.



## Saprotrophic Nutrition

The uptake of nutrients by organism from dead and decaying matter in the form of solution is called the saprotrophic nutrition. The organisms which use saprotrophic mode of nutrition are called saprotrophs. For example: fungi.

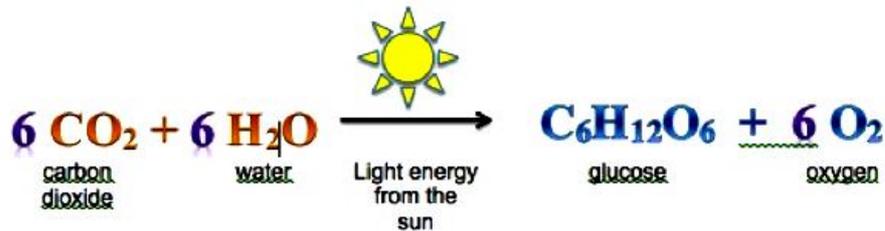
## PLANT NUTRITION

Green plants prepare their own food. They make food in the presence of sunlight. Sunlight provides energy, carbon dioxide and water are the raw materials and chloroplast is the site where food is made.

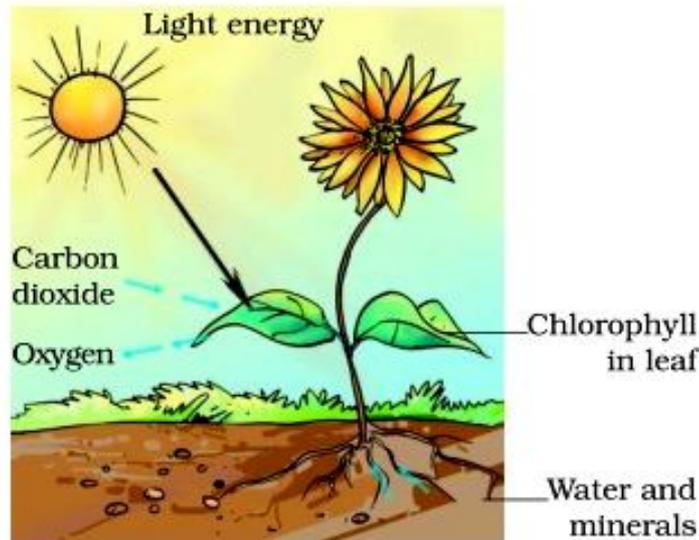
## PHOTOSYNTHESIS

The process by which green plants prepare food is called photosynthesis. During this process; the solar energy is converted into chemical energy and carbohydrates are formed. Green leaves are the main sites of photosynthesis. The green portion of the plant contains a pigment chloroplast; which contains chlorophyll.

The whole process of photosynthesis can be shown by following equation:



The process of photosynthesis can be represented as:



- The process of photosynthesis takes place in the green leaves of a plant.
- The food is prepared by the green leaves of a plant in the form of a simple sugar called glucose.
- The extra glucose is changed into another food called starch. This starch is stored in the leaves of the plant.
- The green plants convert sunlight energy into chemical energy by making carbohydrates.

**The photosynthesis takes place in the following three steps:**

- Absorption of sunlight energy by chlorophyll.
- Conversion of light energy into chemical energy, and splitting of water into hydrogen and oxygen by light energy.

- Reduction of carbon dioxide by hydrogen to form carbohydrate like glucose by utilizing the chemical energy.

### Conditions necessary for photosynthesis:

The conditions necessary for photosynthesis to take place are:

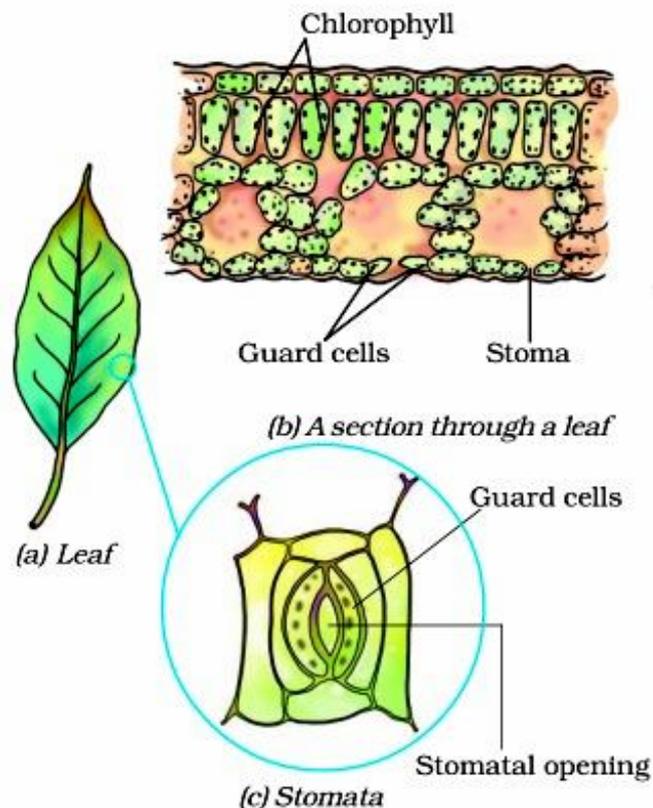
- Sunlight
- Chlorophyll
- Carbon dioxide
- Water

### Raw materials for photosynthesis:

The raw materials for photosynthesis are:

- Carbon dioxide
- Water

### How the plants obtain carbon dioxide?



- There are a large number of tiny pores called stomata on the surface of the leaves of plants.
- The carbon dioxide gas enters the leaves of the plant through the stomata present on their surface.
- Each stomatal pore is surrounded by a pair of guard cells. The opening and closing of stomatal pores is controlled by the guard cells.

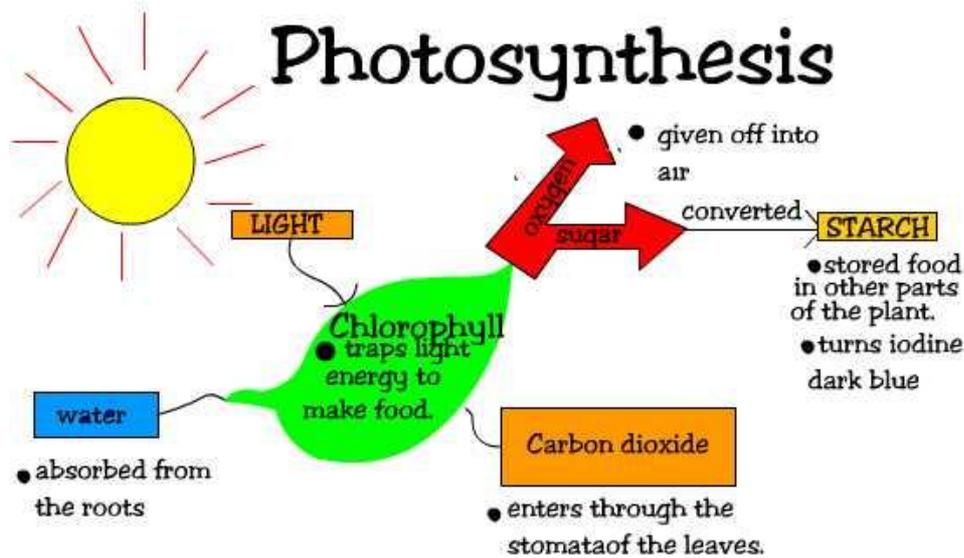
### How the plants obtain water for photosynthesis:

- The water required by the plants for photosynthesis is absorbed by the root of the plants from the soil through the process of osmosis.
- The water absorbed by the roots of the plants is transported upward through the xylem vessels to the leaves where it reaches the photosynthetic cells.

The plants also need other raw materials such as nitrogen, phosphorus, iron and magnesium, etc., for building their body. The plants take these materials from the soil. Nitrogen is essential element used by the plants to make proteins and other compound.

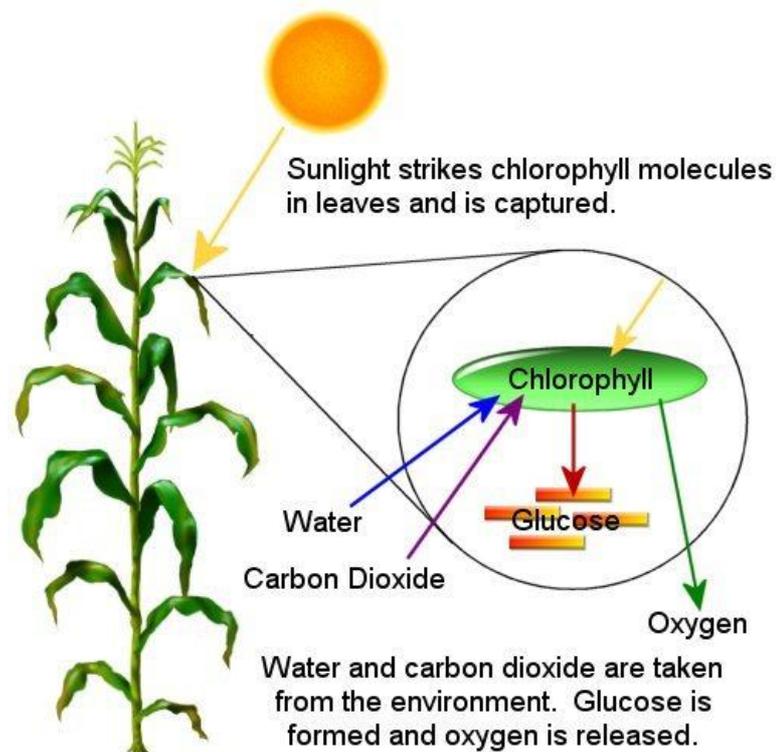
### Site of photosynthesis: Chloroplasts

- Photosynthesis takes place in the leaves of the plants.
- Leaves have green pigment called chlorophyll
- It helps leaves capture the energy of the sunlight which is then used to prepare food from carbon dioxide and water.
- Here, you see that solar energy is captured by the leaves and is stored in the plant in the form of food.
- So, we can say that Sun is ultimate source of energy for all living organisms.



### Significance of Photosynthesis:

- Photosynthesis is the main way through which the solar energy is made available for different living beings.
- Green plants are the main producers of food in the ecosystem. All other organisms directly or indirectly depend on green plants for food.
- The process of photosynthesis also helps in maintaining the balance of carbon dioxide and oxygen in the air.



## PHOTOSYNTHESIS IN ALGAE

Green patches in ponds or near the stagnant water can be seen easily. These green patches are living organism called algae. Algae are plants. Often algae grow near shallow waterlogged areas such as near tube-wells, taps, etc. One may slip over it. Algae look green because of presence of Chlorophyll. Algae prepare their own food by the process of photosynthesis.

## SYNTHESIS OF PLANT FOOD OTHER THAN CARBOHYDRATES

Plants need proteins and fats besides the carbohydrate. Proteins are nitrogenous substances which contain nitrogen. Although nitrogen is present in abundance in atmosphere, but plant cannot absorb atmospheric nitrogen. Plant gets nitrogen from soil. Certain types of bacteria called **rhizobium**, are present in soil. They convert gaseous nitrogen into usable form and release it into the soil. Plants absorb these soluble forms of nitrogen along with water and other minerals through roots.

Sometimes farmers add nitrogenous fertilizer to their field to fulfill the need of nitrogen. In this way plants get fulfillment of nitrogen along with other nutrients. After the fulfillment of all nutrients plants synthesize proteins and fats.

## MODES OF NUTRITION IN NON-GREEN PLANTS

### Heterotrophic Mode of Nutrition in Plants

Some plants do not have the chlorophyll. Hence, they cannot synthesize their food by themselves. Such plants are known as non green plants. They depend on other organisms for food. Such plants use the heterotrophic mode of nutrition.

This type of nutrition can be categorized into

- Parasitic mode of nutrition
- Insectivorous mode of nutrition
- Saprophytic mode of nutrition
- Symbiotic mode of nutrition

### PARASITIC MODE OF NUTRITION

Plants that do not have chlorophyll are called **non-green plants**. Plants, which live on other plants for food, are called parasitic plants.

**Parasite (Parasitic Plant):** Plants that get their food from other plants by living on them are called parasite. Example; Cuscuta, mistletoe.

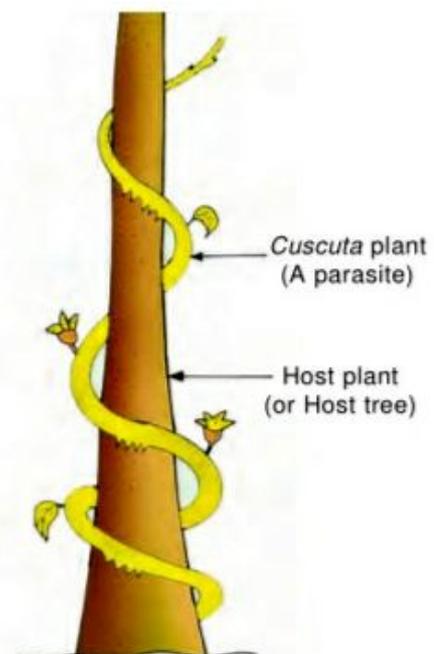
**Cuscuta** is a vine-like plant with yellowish stem. It twines around big trees, like banyan tree. **Cuscuta** gets nutrition from the tree on which it lives. The tree upon which it climbs and lives is called the host. Here, banyan is the host and cuscuta is the parasite.

The adjacent figure shows a parasite plant (Cuscuta) climbing on the stem of its host plant.

Some plants are total parasite while some are partial parasite.

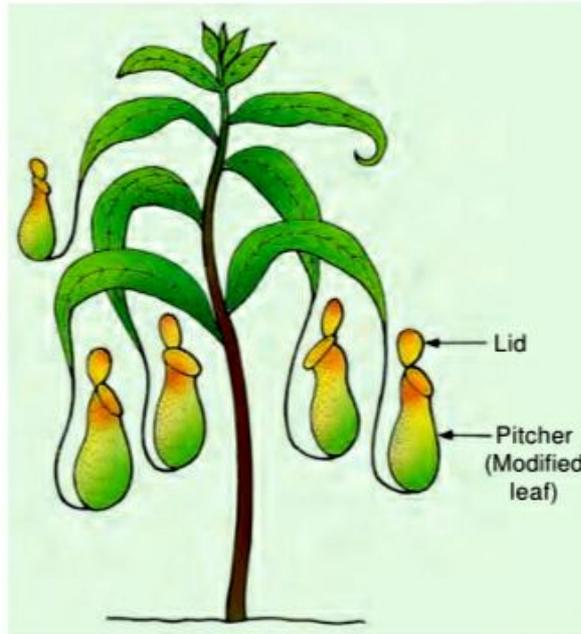
A total parasite fully depends on other plants for their nutrition. For example - cuscuta.

**Partial parasite:** Partial parasite is a parasite that receives a part of its nutrients from host. For example; mistletoe bears green leaves. It synthesizes its own food, but receives water and mineral from the host plant.



## INSECTIVOROUS MODE OF NUTRITION

Some plants eat insects. Such plants are called **insectivorous plants**. They trap and digest the insects. Pitcher plant is the example of an insectivorous plant. In pitcher plant the leaf is modified to form a pitcher like structure. The bright colour of the pitcher makes it very attractive to insects. Inside the pitcher; there are several hair-like structures. These hairs direct the trapped insects downwards. When an insect sits on the pitcher of the plant, the lid closes and the insect gets trapped inside the pitcher. The insect is then digested by the enzymes secreted by the cells of the plants.



Pitcher plant (an insectivorous plant).

### Cause of eating of insects by plants:

The soil of marshy land is deficient in nitrogen. Plants living in marshy areas do not get nitrogen from the soil. Their nitrogen need is fulfilled by sucking the juice of insects. Venus flytrap, utricularia, drosera and Rafflesia are the other examples of insectivorous plants.

## SAPROPHYTIC MODE OF NUTRITION

Saprotrophs are non-green plants e.g. Agaricus (Mushroom) fungi, yeasts and bacteria. Saprotrophs get their food from dead or decaying organic matters. They grow on decaying organic matters such as cow-dung, wood, bread, etc.

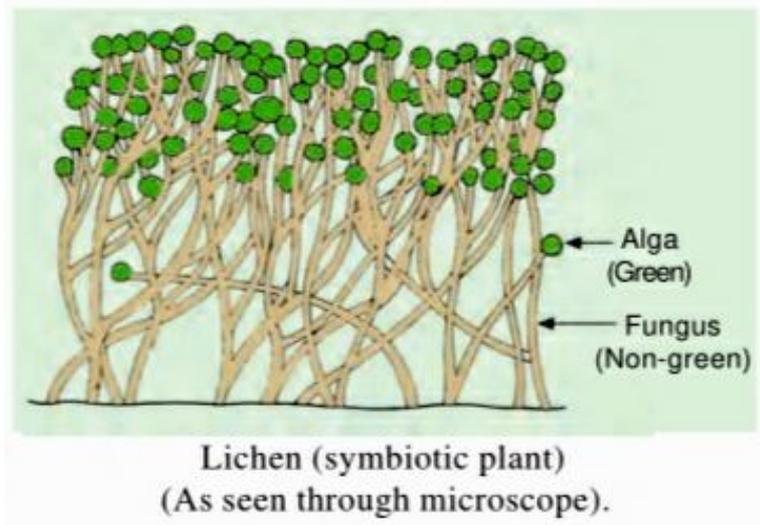
The below figure shows a fungus (mushrooms) growing on the rotting wood of a dead tree.



Saprotrophs secrete digestive juice over the decaying materials and absorb nutrients from them. This is called Saprotrophic Mode of Nutrition.

## SYMBIOSIS MODE OF NUTRITION

Symbiosis is the combination of two Greek words 'Sym' means 'with' and 'biosis' means 'living', which means living together. In symbiosis or mutualism two different types of organisms live and work together for their mutual benefit from each other. They share shelter and nutrients, e.g. Lichens. Lichens are composite organisms composed of fungus and alga. Fungus is a saprophyte and alga is an autotroph. The Fungus supplies water and minerals to the cells of the alga while the alga supplies food; prepared by photosynthesis.



A bird sitting on the back of a rhino is an example of symbiosis. The bird gets worms to eat, while the rhino gets rid of those worms.

## REPLENISHMENT OF NUTRIENTS IN SOIL

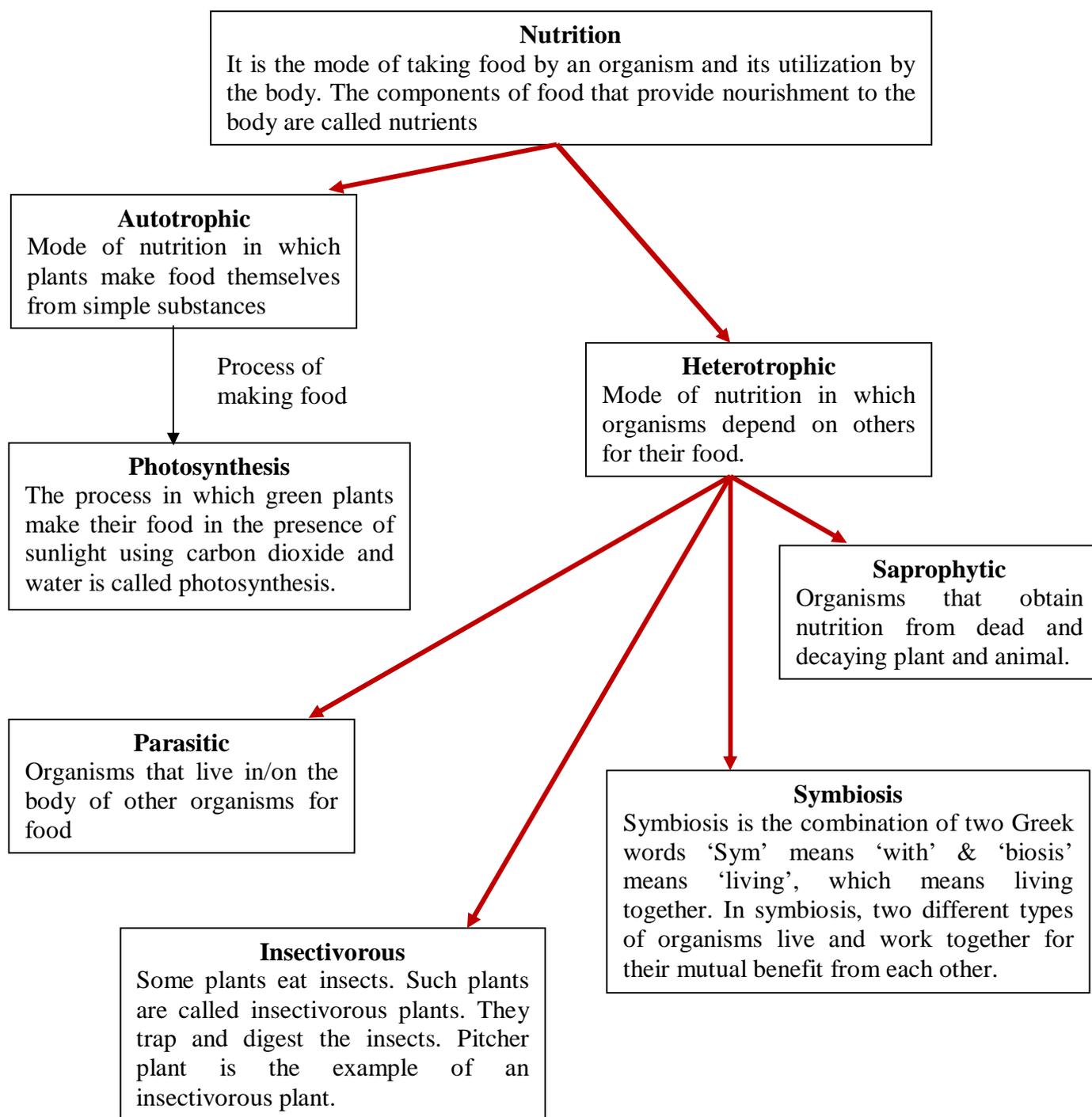
We know that plants continuously take nutrients from the soil in order to synthesize food. As a result of this, the amount of nutrients in the soil decreases.

Nutrients in the soil are replenished by adding fertilisers and manures. Fertilisers and manures contain plants nutrients and minerals like nitrogen, phosphorus and potassium.

Another way to replenish soil is to grow leguminous crops (for example gram, peas, pulses etc.) in the soil. 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. In return plants provide food and shelter to the bacteria.

Thus plants and bacteria have a symbiotic relationship here.

## REVISION CHART



**1. Why do organisms need to take food?**

**Ans:** All living organisms require food to survive. It gives them energy to perform various activities. All activities such as playing, running, walking, studying, etc. require energy. The various components present in our food such as carbohydrates, proteins, fats, vitamins, and minerals provide energy to our body. These are also important for growth and development of the body.

**2. Distinguish between a parasite and a saprotroph.**

**Ans:**

**Parasite (Parasitic Plant):** Plants that get their food from other plants by living on them are called parasite. Example; Cuscuta, mistletoe. Cuscuta is a vine-like plant with yellowish stem. It twines around big trees, like banyan tree. Cuscuta gets nutrition from the tree on which it lives.

**Saprotrophs:** Saprotrophs are non-green plants e.g. Agaricus (Mushroom) fungi, yeasts and bacteria. Saprotrophs get their food from dead or decaying organic matters. They grow on decaying organic matters such as cow-dung, wood, bread, etc.

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

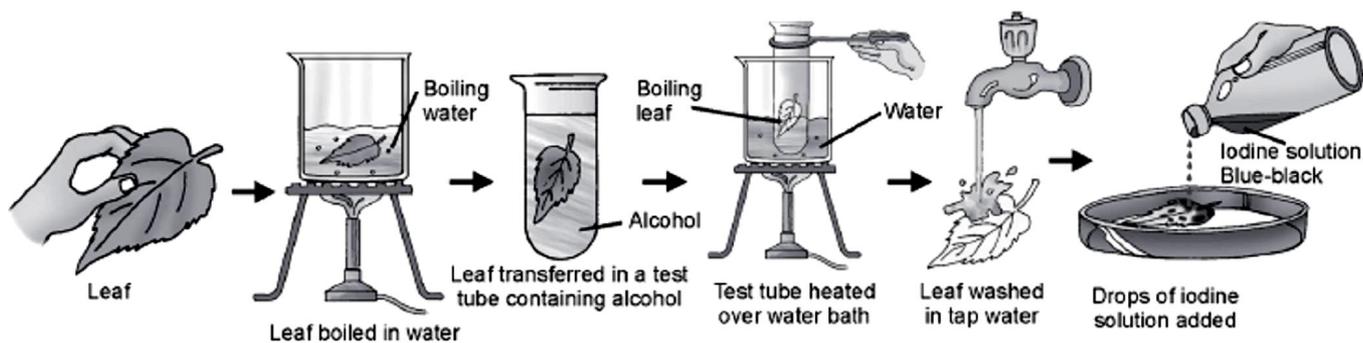
**Ans:**

**Aim:** To test for the presence of starch in leaf.

**Materials Required:** Green leaf, beaker, tripod stand, burner, test tube, alcohol, iodine solution, tap water and petri dish.

**Procedure:**

- Pluck a healthy green leaf of a plant which was kept in sunlight.
- Boil it in water contained in a beaker for about two minutes. This will make the leaf soft and stop any further chemical changes in it.
- Put the leaf in a test tube containing alcohol.
- Place the test tube in a beaker of boiling water.
- The alcohol will bleach the leaf and make it free from chlorophyll.
- Wash the leaf in water. Place it in a petri dish and add a few drops of iodine solution.



**Observation :** The leaf turns blue-black.

**Conclusion :** The leaf changes into blue-black colour due to presence of starch in it.

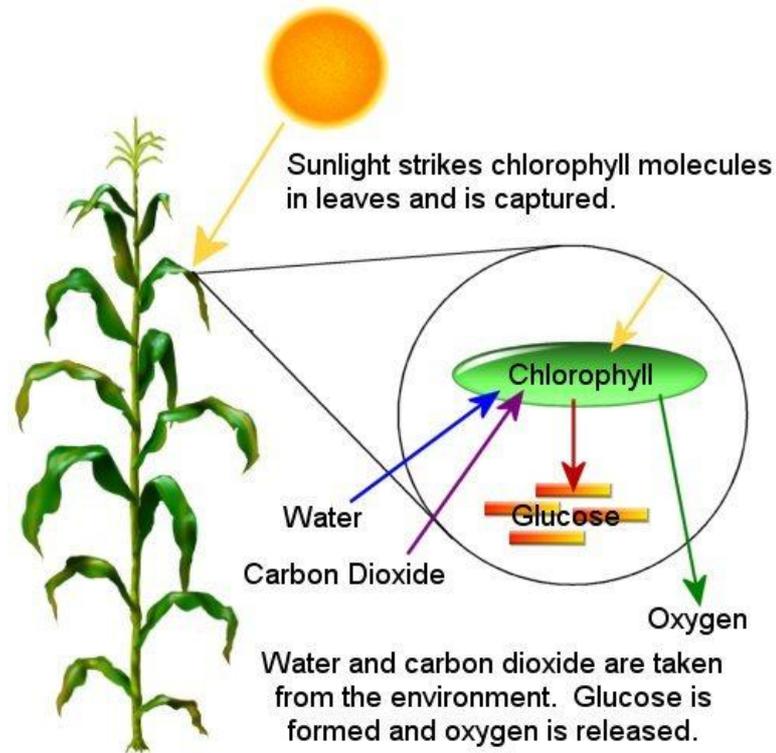
**4. Give a brief description of the process of synthesis of food in green plants.**

**Ans:** Photosynthesis is defined as the process in which the chlorophyll-containing plant cells synthesise food in the form of carbohydrates, using carbon dioxide and water in the presence of solar energy.

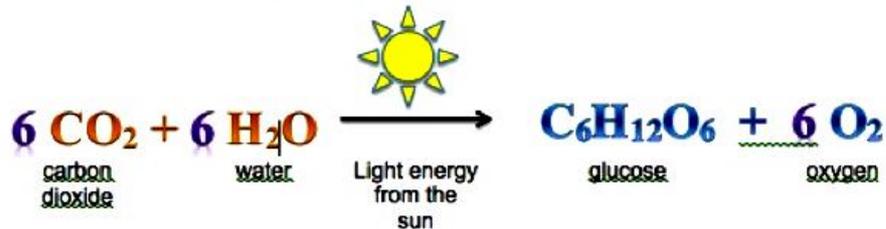
**Photosynthesis**

Sources of raw materials required for photosynthesis:

- (a) Water is taken in from the roots of the plant and is transported to the leaves.
- (b) Carbon dioxide from the air enters the leaves through the tiny pores called stomata and diffuses to the cells containing chlorophyll.
- (c) Solar energy is used to break water into hydrogen and oxygen. This hydrogen is combined with carbon dioxide to form food for the plants, which is ultimately used by the animals as well.

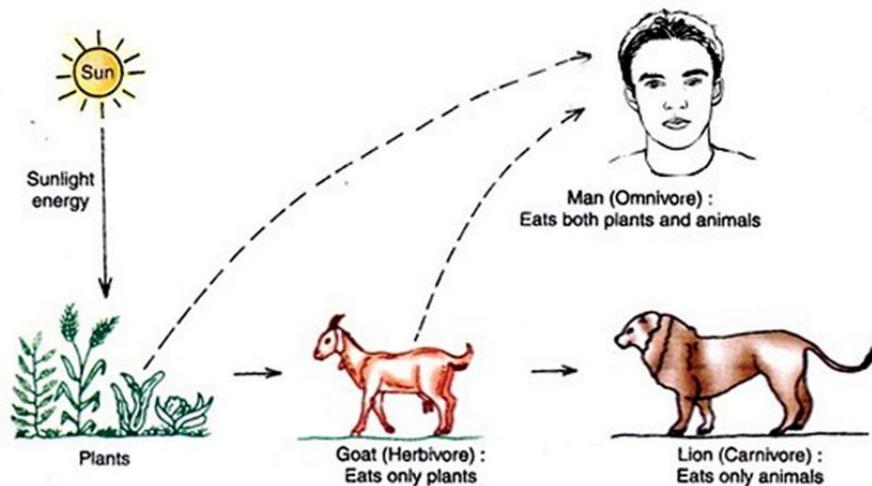


Thus, photosynthesis can be represented by the following equation.



5. Show with the help of a sketch that the plants are the ultimate source of food.

Ans: The mode of nutrition shows that the plant is the ultimate producer. Only plant can produce food and rest of other organisms are directly or indirectly dependent on it.



**6. Fill in the blanks:**

- (a) Green plants are called \_\_\_\_\_ since they synthesise their own food.
- (b) The food synthesised by the plants is stored as \_\_\_\_\_.
- (c) In photosynthesis solar energy is captured by the pigment called \_\_\_\_\_.
- (d) During photosynthesis plants take in \_\_\_\_\_ and release \_\_\_\_\_.

**Ans:** (a) Green plants are called autotrophs since they synthesise their own food.  
(b) The food synthesised by the plants is stored as starch.  
(c) In photosynthesis solar energy is captured by the pigment called chlorophyll.  
(d) During photosynthesis plants take in carbon dioxide and release oxygen.

**7. Name the following:**

- (i) A parasitic plant with yellow, slender and tubular stem.
- (ii) A plant that has both autotrophic and heterotrophic mode of nutrition.
- (iii) The pores through which leaves exchange gases.

**Ans:** (i) Cuscuta (ii) Pitcher plant (iii) Stomata

**8. Tick the correct answer:**

- (a) Amarbel is an example of: (i) autotroph (ii) parasite (iii) saprotroph (iv) host  
**Ans:** (ii) parasite

- (b) The plant which traps and feeds on insects is:  
(i) cuscuta (ii) china rose (iv) pitcher plant (iv) rose  
**Ans:** (iii) pitcher plant

**9. Match the items given in Column I with those in Column II:**

Column I	Column II
Chlorophyll	Bacteria
Nitrogen	Heterotrophs
Amarbel	Pitcher plant
Animals	Leaf
Insects	Parasite

**Ans:** Chlorophyll – Leaf, Nitrogen – Bacteria, Amarbel – Parasite, Animals – Heterotrophs  
Insects – Pitcher plant

**10. Mark ‘T’ if the statement is true and ‘F’ if it is false:**

- (i) Carbon dioxide is released during photosynthesis. (T/F)
- (ii) Plants which synthesise their food themselves are called saprotrophs. (T/F)
- (iii) The product of photosynthesis is not a protein. (T/F)
- (iv) Solar energy is converted into chemical energy during photosynthesis. (T/F)

**Ans:**  
(i) False (ii) False (iii) True (iv) True

**11. Choose the correct option from the following:**

- Which part of the plant gets carbon dioxide from the air for photosynthesis.  
(i) root hair (ii) stomata (iii) leaf veins (iv) sepals

**Ans:** (ii) stomata

**12. Choose the correct option from the following:**

- Plants take carbon dioxide from the atmosphere mainly through their:  
(i) roots (ii) stem (iii) flowers (iv) leaves

**Ans:** (iv) leaves

## QUESTION BANK (SET 01)

1. Organisms which prepare food for themselves using simple naturally available raw materials are referred to as  
(a) heterotrophs                      (b) autotrophs                      (c) parasites                      (d) saprophytes
2. In the absence of which of the following will photosynthesis not occur in leaves?  
(a) Guard cells                      (b) Chlorophyll                      (c) Vacuole                      (d) Space between cells
3. Which of the following statements is/are correct?  
(i) All green plants can prepare their own food.  
(ii) Most animals are autotrophs.  
(iii) Carbon dioxide is not required for photosynthesis.  
(iv) Oxygen is liberated during photosynthesis.  
Choose the correct answer from the options below:  
(a) (i) and (iv)                      (b) (ii) only                      (c) (ii) and (iii)                      (d) (i) and (ii)
4. Pitcher plant traps insects because it  
(a) is a heterotroph.                      (b) grows in soils which lack in nitrogen.  
(c) does not have chlorophyll.                      (d) has a digestive system like human beings.
5. The term that is used for the mode of nutrition in yeast, mushroom and bread-mould is  
(a) autotrophic                      (b) insectivorous                      (c) saprophytic                      (d) parasitic
6. When we observe the lower surface of a leaf through a magnifying lens we see numerous small openings. Which of the following is the term given to such openings?  
(a) Stomata                      (b) Lamina                      (c) Midrib                      (d) Veins
7. Two organisms are good friends and live together. One provides shelter, water, and nutrients while the other prepares and provides food. Such an association of organisms is termed as  
(a) saprophyte                      (b) parasite                      (c) autotroph                      (d) symbiosis
8. Which of the following raw material is available in the air for photosynthesis?  
(a) Oxygen                      (b) Carbon dioxide                      (c) Nitrogen                      (d) Hydrogen
9. Small aerating pores present in the leaf are known as  
(a) chlorophyll                      (b) lentil                      (c) stomata                      (d) vessels
10. Which of the following is the type of heterotrophic nutrition in plants?  
(a) Saprotrophic                      (b) Symbiotic                      (c) Parasitic                      (d) All of these
11. Mushroom, yeast, mould and bacteria are the examples of  
(a) symbionts                      (b) parasites                      (c) decomposers                      (d) autotrophs
12. The process by which plants lose water in the form of water vapour is  
(a) respiration                      (b) transpiration                      (c) photosynthesis                      (d) nutrition
13. Organisms need nutrition to —  
(a) Grow                      (b) Get energy  
(c) Fight against diseases                      (d) All of the above

14. Products of photosynthesis are —  
 (a) Protein, oxygen and carbon dioxide  
 (b) Carbon dioxide and oxygen  
 (c) Carbohydrate and oxygen  
 (d) Protein, fat and carbohydrate
15. \_\_\_\_\_ is used in starch test .  
 (a) Safranin (b) Blue ink (c) Iodine (d) Litmus
16. To which of the following category does a pitcher plant belong ?  
 (a) Herbivore (b) Carnivore (c) Insectivore (d) Both (b) and (c)
17. Parasites —  
 (a) Prepare their own food (b) Live on other living beings  
 (c) Live on dead organisms (d) Eat insects
18. Water reaches the leaves from root by \_\_\_\_\_.  
 (a) Stomata (b) Phloem (c) Xylem (d) All of the above
19. One should not sleep under the trees at night because —  
 (a) Plants make food during the night  
 (b) Trees also sleep at night  
 (c) Carbon dioxide ratio is higher under the trees at night  
 (d) One can catch a cold
20. Which of the following is used from the atmosphere during photosynthesis?  
 (a) Oxygen (b) Hydrogen (c) Minerals (d) Carbon dioxide
- 21. Fill in the blanks.**
- (a) Carbon dioxide is used from the atmosphere during \_\_\_\_\_.
- (b) Sundew plant is an example of \_\_\_\_\_ plants.
- (c) \_\_\_\_\_ is an example of a total stem parasite.
- (d) Mineral nutrients like nitrogen and phosphorous are used by plants for their \_\_\_\_\_ and development.
- (e) \_\_\_\_\_ are chemical substances present in food.
- (f) Starch gives a blue-black colour with a solution of \_\_\_\_\_ .
- (g) \_\_\_\_\_ is the site of photosynthesis in plants.
- (h) Autotrophs are all \_\_\_\_\_ plants.
- (i) \_\_\_\_\_ is a plant parasite.
- (j) During photosynthesis, the chlorophyll traps the energy from \_\_\_\_\_ .
- (k) Plant food is stored in the form of \_\_\_\_\_ .
- (l) Plants get nitrogen in the form of \_\_\_\_\_ from soil.
- (m) \_\_\_\_\_ depend on dead and decaying organic matter for food.
- (n) Mode of nutrition in algae is \_\_\_\_\_ .

(o) \_\_\_\_\_ is an example of symbiotic association.

(p) A fungus we like to eat is \_\_\_\_\_ .

**22.** Differentiate between:

(a) Autotrophic and heterotrophic mode of nutrition.

(b) Total parasites and partial parasites

**23.** Why are green leaves called ‘the kitchen of the plant’?

**24.** Name all the nutrients present in food.

**25.** Define nutrition.

**26.** Define photosynthesis and write its chemical reaction.

**27.** What are the raw materials used in photosynthesis ?

**28.** Write a difference between chlorophyll and chloroplast.

**29.** What type of relationship is shown by lichens ?

**30.** How does water reach the leaves for synthesising food ?

**31.** How are nutrients taken up by the plants ?

**32.** Explain the process of nutrition in mushroom.

**33.** ‘In the absence of photosynthesis, there would be a barren place; justify the statement.

**34.** Explain symbiotic nutrition with the help of an example.

**35.** Although being a green plant, the pitcher plant traps insects. Why?

**36.** Plants use nitrogenous compounds to synthesize proteins. Mention the methods by which atmospheric nitrogen is converted into usable forms.

**37.** Chlorophyll is necessary for photosynthesis. Explain with the help of an activity.

**38.** Explain the presence of starch in the green leaves with the help of labelled diagrams.

**39.** Explain the following insectivorous plants with diagrams. Also, explain the modification of their leaves to trap the insects.

(i) Pitcher plant    (ii) Venus flytrap    (iii) Sundew plant

**40.** Draw a labelled diagram of stomata and explain its structure.

**41.** How will you prove that starch is formed during photosynthesis?

**42.** Explain the types of heterotrophic nutrition in plants.

**43.** Draw a pitcher plant and describe its modifications to traps insects.

**44.** Explain symbiotic nutrition in lichens.

**45.** What are plant nutrients ? How are they replenished in the soil ?

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## QUESTION BANK (SET 02)

1. What are the components of food?  
Answer: Carbohydrates, proteins, fats, vitamins and minerals are the components of food.
2. What is nutrition?  
Answer: The process of utilization of food by a living organism to obtain energy is called nutrition.
3. Why is need of nutrition?  
Answer: Animals do not make their food themselves which plants do. Animals eat plants or plant eating animals. Hence, animals are directly or indirectly depend on plants.
4. What is autotroph?  
Answer: Organisms that make their food themselves are called autotrophs.
5. What is autotrophic mode of nutrition?  
Answer: The mode of nutrition in which the organism makes its own food is called autotrophic mode of nutrition.
6. Give some example of autotrophs.  
Answer: All green plants, such as grass, mango, bougainvillea, etc. are the examples of autotrophs. Some bacteria also show autotrophic nutrition.
7. What is photosynthesis?  
Answer: The process of making food in green plants in the presence of sunlight is known as photosynthesis.
8. What are the essentials factors for the photosynthesis?  
Answer: Carbon dioxide, water, chlorophyll and sunlight are essentials factors for photosynthesis to take place.
9. What is chlorophyll?  
Answer: Chlorophyll is the green pigment present in green leaves.
10. Why do leaves look green?  
Answer: Leaves look green because of the presence of chlorophyll, which is a green pigment.
11. What is the function of chlorophyll?  
Answer: Chlorophyll absorbs the sunlight for photosynthesis.
12. What are the final products made after photosynthesis?  
Answer: Glucose and oxygen are the final products after photosynthesis.
13. What are stomata?  
Answer: The small pores present on the lower surface of leaf, are called stomata.
14. What is function of stomata?  
Answer: Stomata absorb carbon dioxide from air for photosynthesis. Stomata facilitates exchange of gases and transpiration.

**15.** What is the ultimate source of energy?

Answer: Sun is the ultimate source of energy.

**16.** How water is transported to the leaves?

Answer: Water is transported to the leaves through pipe like structures from the roots of plant. These pipe-like structures are present from root to leaves through branches throughout.

**17.** What is heterotrophic mode of nutrition?

Answer: The mode of nutrition in which an organism takes food from another organism is called heterotrophic mode of nutrition. The nutrition in animals and non-green plants is the example of heterotrophic mode of nutrition.

**18.** Give examples of Heterotrophs.

Answer: Animals and non green plants are the examples of heterotrophs.

**19.** What are saprotrophs?

Answer: Organisms which get their nutrition from dead or decaying plants in liquid form are called saprotrophs.

**20.** What are the nutrients other than carbohydrates which are required by plants?

Answer: Proteins and fats are the nutrients; other than carbohydrates; which are required by plants.

**21.** In which form do plants absorb nitrogen?

Answer: Plants absorb soluble form of nitrogen.

**22.** Why do farmers add nitrogenous fertilizers to the soil?

Answer: Farmers add nitrogenous fertilizers to the soil to fulfill the requirement of nitrogen of the plants. Nitrogen is necessary to synthesize proteins.

**23.** Which microorganism help to provide nitrogen to the plants?

Answer: A certain type of bacteria called rhizobium helps to provide nitrogen to the plants.

**24.** How do plants absorb nutrients other than carbohydrates from the soil?

Answer: Other nutrients are available in the soil in the form of minerals. Plants absorb these minerals from the soil; along with water.

**25.** What do you understand by parasitic plants?

Answer: A plant which lives on another plant and takes nutrients is called a parasitic plant.

**26.** Give some examples of parasitic plants.

Answer: Cuscuta and mistletoe

**27.** Why some plants are called parasites?

Answer: Some plants are unable to prepare their own food and need to take food from another plant. Hence, they are called parasites.

**28.** What is the mode of nutrition in non-green plants?

Answer: Non-green plants show heterotrophic mode of nutrition.

**29.** What do you understand by non-green plants?

Answer: A plant which lacks chlorophyll is called non-green plant.

**30.** What do you understand by host?

Answer: An organism which provides shelter and nutrition to another organism is called a host.

**31.** What is partial parasite?

Answer: A parasite which depends for some of the nutrients; on another organism; is called a partial parasite.

**32.** Give example of partial parasitic plants?

Answer: Mistletoe

**33.** What is an insectivorous plant?

Answer: A plant which fulfills its nitrogenous needs by eating insects is called an insectivorous plant.

**34.** Give an example of insectivores plant?

Answer: Pitcher plant, Venus Fly trap, Bladderwort, Drosera, Rafflesia

**35.** Why does a plant eat insects?

Answer: Plants living in marshy areas do not get nitrogen from the soil. To fulfill their nitrogenous need, they need to eat insects.

**36.** Write a brief note on pitcher plants?

Answer: In a pitcher plant, the leaf is modified into a pitcher like structure. The pitcher is complete with a lid. The inside of pitcher is full of hair-like structures. The pitcher is used to trap insects which may fall in it.

**37.** What do you understand by saprotrophs?

Answer: An organism which feed on dead and decaying material is called a saprotroph. In this mode of nutrition, digestive enzymes are secreted on the food. The digested food is then absorbed by the organism. In saprotrophs digestion takes place outside the body of the organism.

**38.** Saprophytes grow in which type of places?

Answer: Saprophytes grow in humid and hot conditions.

**39.** Give some example of saprotrophs.

Answer: Mushroom, yeast, toadstool, etc.

**40.** What is the meaning of word 'Symbiosis'?

Answer: It is a relationship between two organisms in which both the organisms benefit each other.

**41.** What is Lichen?

Answer: The lichen is a composite organism formed because of symbiosis of algae and fungi.

**42.** Give an example of symbiotic relationship.

Answer: A small bird; called plover; cleans the crocodile's teeth. The crocodile keeps its mouth open and the bird takes out meat fibres stuck between the teeth. The bird gets food in lieu of providing dentist's services to the crocodile.

43. How do nutrients get replenished in the soil?

Answer: There are two main means through which nutrients get replenished in the soil. One of them is the nitrogen fixation in soil. Nitrogen fixation replenishes nitrogenous nutrients in the soil. Another mean is decomposition of dead remains of plants and animals (or farm waste). Decomposition of dead remains replenishes various other nutrients in the soil.

44. What is Rhizobium?

Answer: Rhizobium is a bacterium.

45. What is the function of Rhizobium?

Answer: Rhizobium helps leguminous plants in nitrogen fixation in soil.

46. How does Rhizobium help farmers?

Answer: By helping in nitrogen fixation, rhizobium increases soil fertility and thus helps farmers.

47. Why do farmers prefer to sow leguminous plants?

Answer: Leguminous plants carry out nitrogen fixation in soil and thus improve soil fertility.

48. In which form do plants absorb nitrogen?

Answer: Plants absorb nitrogen in the form of nitrates.

49. Write True for the correct statement and False for the incorrect statement.

(a) Plants derive oxygen from atmosphere and nitrogen from the soil. \_\_\_\_\_

(b) Sandalwood is an example of a total root parasite. \_\_\_\_\_

(c) Colourful leaves of coleus and croton cannot perform photosynthesis. \_\_\_\_\_

(d) All green plants prepare food in the form of glucose. \_\_\_\_\_

(e) Venus fly-trap is an example of parasitic plant. \_\_\_\_\_

Answer:

(a) True

(b) False

(c) False

(d) True

(e) False

50. Match the columns.

Column A	Column B
(1) Lichen	(i) single-celled green plant
(2) Pitcher plant	(ii) nitrogen fixing bacteria
(3) Chlamydomonas	(iii) mutual association of algae and fungi
(4) Rhizobium	(iv) an insectivorous plant

Answer:

(1) (iii)

(2) (iv)

(3) (i)

(4) (ii)