Synopsis:

- **Science is the study of nature.**
- **The three main branches of science are Biology— Study of living beings**
    1. **Chemistry — Study of composition and properties of the matter.**
    2. **Physics — Study of various physical phenomenon like gravitation, magnetism, electricity etc.**
- **Biology is called Life Sciences.**
- **Study of plants is called Botany.**
- **Study of animals is called Zoology.**
- **The characteristics of the living things are:**
    1. **body made up of cells**
    2. **movement**
    3. **growth**
    4. **fixed life – span**
    5. **respiration**
    6. **responsiveness**
    7. **nutrition**
    8. **excretion reproduction.The cell is the basic unit of life.**
- **The living being made of only one cell is called unicellular organisms and those made up of more than one cell is called multicellular organisms.**
  Examples of unicellular organisms: Amoeba, Paramecium etc
- **Autotrophs: The living things which can make their own food. i.e. green plants.**
- **Heterotrophs: The living things which take their food directly or indirectly from other sources.**
- **The process used to release energy from the burning of food is called the respiration.**

- **(i) Waste products in animals:**

    1. **urea**
    2. **uric acid**
    3. **carbon – di- oxide**
    4. **salts**
    5. **water etc.**

- **(ii) Waste products in plants:**

    1. **gums**
    2. **resins**
    3. **tannins etc.**

- **The reaction which an individual shows to the stimulus is called response.**
- **All plants and animals reproduce.**

Review Questions

1. Tick (✓) the appropriate answer:

(i) Identify the plant which has compound leaves:
(a) Banana
(b) Banyan
(c) Mango
(d) Rose

(ii) Which one of the following is not an insectivorous plant—
(a) Pitcher plant
(b) Venus flytrap
(c) Bladderwort
(d) Cactus

(iii) This leaf shows parallel venation:
(a) Banana
(b) Mango

(c) Banyan
(d) Guava

(iv) The point on the stem from where the leaf arises is:
(a) Petiole
(b) Lamina
(c) Node
(d) Trunk

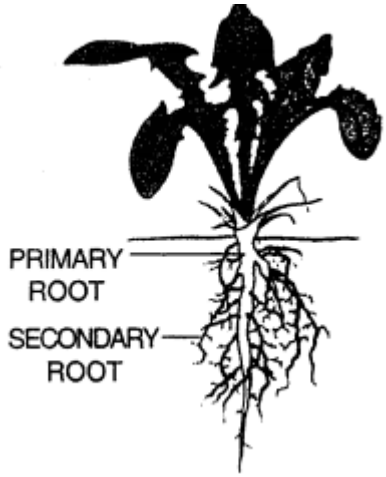
(v) Which one of the following is essential for photosynthesis:
(a) Carbon dioxide
(b) Nitrogen
(c) Oxygen
(d) Soil

Question 2.
Name the following:
Answer :

1. **The part of the plant which grows under the ground: root**
2. **The part of the plant which grows above the soil: shoot**

Question 3.
Differentiate between the following:
(i) Tap root and Fibrous root
Answer :
Tap root

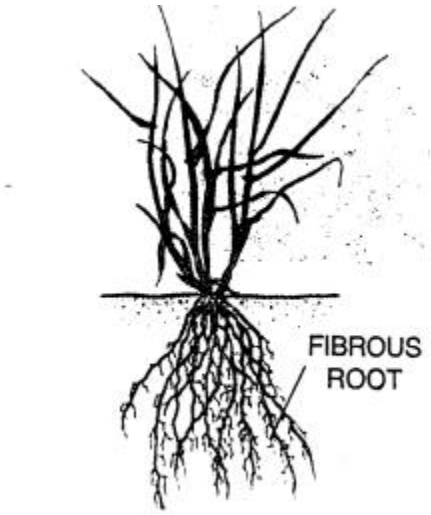
1. **This root has one main primary root with many side secondary roots.**
2. **It is found in dicot plants.**



3. **e.g. mango, pea**

Fibrous root

1. **These roots are clusters of same thickness and size, arising from the base of the stem.**
2. **It is found in monocot plants,**
3. **e.g. maize, wheat**



(ii) Simple Leaf and compound leaf
Answer :
Simple Leaf

1. **The Lamina is uni divided and is a single piece.**
2. **Example : mango,banana, banyan, etc.**

Compound Leaf

1. **The leaf blade or lamina is divided into smalled units called leaflets.**

2. **Example is rose.**

(iii) Parallel venation and reticulate venation
Answer :
Parallel Venation

1. **In this type of venation,veins and veinlets are irregularly distributed in the lamina, forming a network.**
2. **Examples are peepal, mango and guava leaves.**

Reticulate Venation

1. **In this type of venation, veins are parallel to each other.**
2. **Examples are banana, grass and wheat leaves.**

Question 4.
What are the four functions of the roots ?
Answer :
The root serves the following functions :

1. **It fixes the plant in the soil.**
2. **Absorbs water and minerals from the soil for the entire plant.**
3. **It acts as a storage part for food materials for certain plants.**
4. **It binds the soil together so that it does not get washed away during rain or blown over by the wind.**

Question 5.
Mention the functions of the following :
(i) Spines
(ii) Tendril
(iii) Scale leaves
Answer :
(i) Spines—The leaves may be modified to form spines to reduce water loss by transpiration in desert plants.
(ii) Tendril — The stem may occur in the form of their thread – like leafless branch called tendril. It has the ten-dency to coil around any object and help the plant to climb it
(iii) Scale leaves — Scale leaves are present in some plants like onion and

ginger. They are thin and dry or thick and fleshy and their function is to protect buds.

Question 6.
Define venation. What are the different types of ve-nation found in the leaves ?
Answer :
Venation: Arrangement of pattern of veins in a lanuina is called venation.
It is mainly of two types :

1. **Reticulate venation : Veins and veinlets are irregularly distributed in the lamina forming a network.**
   Example: mango, guava.
2. **Parallel venation: Veins run parallel to each other**
   Example: Banana, grass, wheat

Question 7.
Describe the modifications of leaf in any one insec-tivorous plant.
Answer :
Modification of leaves in Venus flytrap (an insectivorous plant)
The leaves of Venus flytrap have long pointed hair. It is divided into two parts having midrib in between like a hinge. When an insect visits the leaf, it closes its two parts and traps the insect. The insect is then digested by secreting digestive juices.

Question 8.
Write the two main functions of leaves.
Answer :
The two main functions of leaves are –

1. **Photosynthesis – Green leaves contain chlorophyll which, in presence of sunlight, manufacture food using carbon-dioxide and water.**
2. **Transpiration – Surface of leaves have minute pores which help in loss of water by evaporation. It has cooling effect making roots absorb more water due to suction.**

Question 9.
What is the modification seen in the Bryophyllum. Explain.
Answer :

1. **Bryophyllum is a plant whose leaves produce adventitious buds in their margin.**
2. **The adventitious buds grow into new plants when they fall off from the parent plant.**

Question 10.
Define:
(i) Photosynthesis
(ii) Tranpiration
Answer :
(i) Photosynthesis — The process by which plant leaf prepares or synthesises food from water and carbon dioxide in the presence of chlorophyll and sunlight is called photosynthesis.
(ii) Tranpiration — This is the process by which there is a loss of water in the form of vapour by evaporation from the surface of leaves. It has cooling effect, it causes suction force to make roots absorb more water with mineral ions.

Question 11.
Name the wide flat portion of the leaf
Answer :
The green, flat and broad part of the leaf is called 'lamina' or 'leaf blade'.

Question 12.
What purpose is served by the spines horned on the leaves of cactus.
Answer :
Leaves are modified into spines to reduce water loss, like cactus. In prickly poppy, leaves bear spines on the margin.

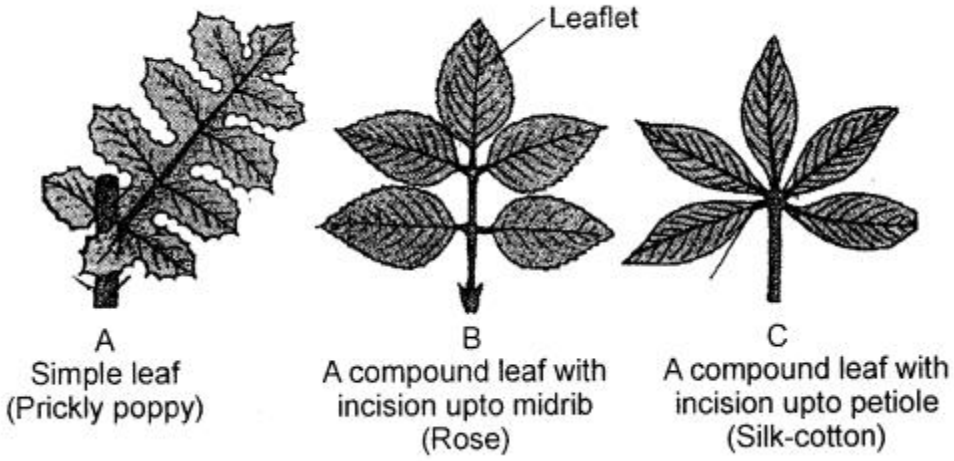
Question 13.
Explain why leaf survival is so important to the plant?
Answer :
Because they perform two main function of photosynthesis and transpiration.

Question 14.
Give an example of the following and draw generalized diagrams for the same:
(i) Simple leaf and compound leaf.
(ii) Parallel venation and reticular venation.

Answer :

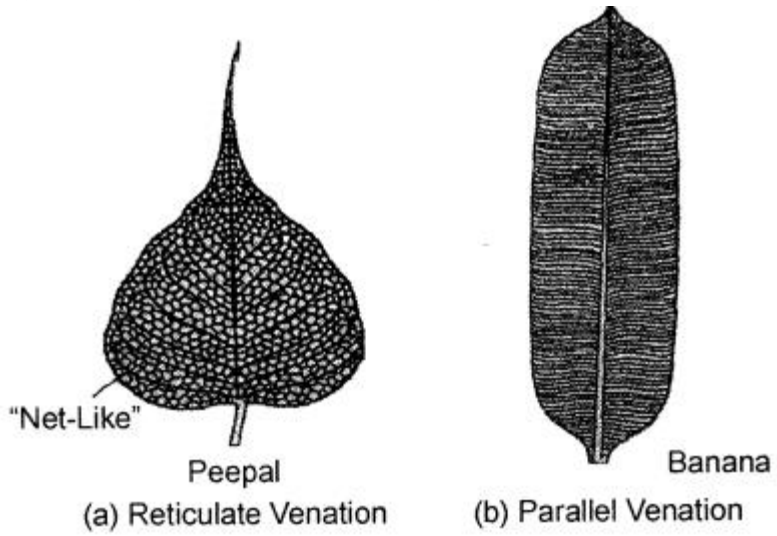
(i) Simple leaf and compound leaf.

1. **Simple leaf: In a simple leaf, the lamina is undivided and is a single piece, e.g., mango, banana, banyan, etc.**
2. **Compound leaf: In a compound leaf, the leaf blade or lamina is divided into smaller units called leaflets e.g., rose.**



(ii) Parallel venation and reticular venation.

1. **Parallel venation: In this type of venation, veins run parallel to each other, e.g., banana, grass, maize and wheat leaves (monocot plants).**
2. **Reticulate venation: In this type of venation, veins and veinlets are irregularly distributed in the lamina, forming a network, e.g. peepal, mango and guava leaves (dicot plants).**



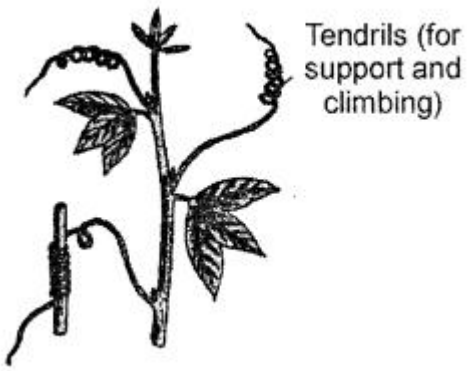
Question 15.
In list some of the advantages of transpiration to green plants.
Answer :
It helps to maintain the concentration of the sap inside the plant body:
The roots continue to absorb water from the soil. If excess water does not evaporate through transpiration, the sap will become dilute, preventing further absorption of water and minerals from the soil.
Cooling effect: In transpiration, water gets evaporated from the plant. The heat required for evaporation of water is obtained from the plant itself and thus, the plant cools itself when it is hot outside.

Question 16.
Why do some plants have to trap insects ?
Answer :
Insectivorous plants trap insect because they grow in a soil which is deficient in nitrogen and insects help in fulfilling the nitrogen requirement of plants.

Question 17.
Explain some of the modifications of leaves found in plants.
Answer :
Sometimes, the complete leaf or a part of the leaf is modified to perform a special function.
Some of these modifications include:

1. **Leaf tendril: In case of certain weak stemmed plants, leaves or leaflets are modified into wiry, coiled structures called tendrils. They are sensitive to touch. As they touch any object, they coil around it and support the plant to climb up. Eg., Sweet pea (upper leaflets are modified into tendrils).**
2. **Spines: Leaves are modified into spines to reduce water loss, like cactus. In prickly poppy, leaves bear spines on the margin.**
3. **Scale leaves: In some plants, like onion and ginger, thin and dry or thick and fleshy scale leaves are present.Their function is to protect buds.**

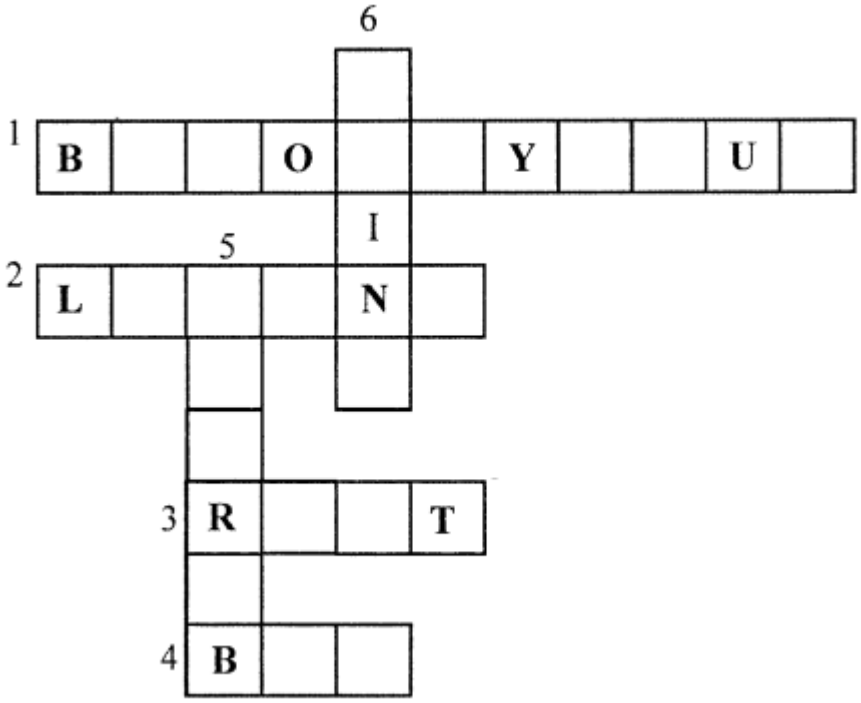
Question 18.
What is a tendril ? Explain its use to the plant.



Sweet Pea

Answer :
A tendril is a specialized stem, leave or petrole with a thread like shop. They are sensitive to touch. As they touch any object, they coil around it and support the plant to climb up. Example : Sweet pea (upper leaflets are modified into tendrils).

Question 19.
Complete the cross word using the clues given below. Check your performance with the correct solutions given at the end of the chapter.



Answer :
Clues across:

1. **Plant that bears buds in leaves for propogation.**
2. **The flattened green part of leaf.**
3. **Underground plant part.**
4. **Structure that develops into flower.**

Clues down:

5. **The central big vein of a leaf.**
6. **A modification seen in of cactus.**