

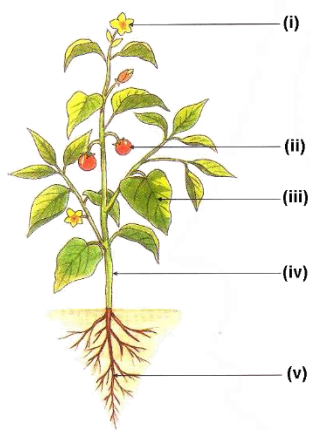
GETTING TO KNOW PLANTS

Introduction

We are surrounded by plants of different size and shapes. That mean plants are all around us. They are living organisms which grow in a permanent site, absorbing water and minerals through its roots and synthesizing its own food using sunlight and green pigment chlorophyll.

Some plants are so tiny that they cannot be seen by the naked eye, while some trees have trunks that are wider than a truck.

Note : Plants make their food by photosynthesis process.



Type of Plants

All the common plants that we see around us can be classified on the basis of the size, shape and thickness of their stems. Thus, plants can be classified as: herbs, shrubs, trees, creepers and climbers

(a) Herbs :

- Plants which have soft, green and perishable stems are called herbs.
- They are generally smaller in size, they are not more than one meter in height
- They may live for 1-2 seasons. Examples of some herbs are grass, maize, rice, mint, coriander, etc.



Mustard



Dahlia

(b) Shrubs :

- Plants with woody stems with branches of almost equal size arising from the stem immediately above the soil are called shrubs.
- They are medium-sized plants which look like bushes.
- They survive for many years, though less than trees.

Example : China rose, lemon, pomegranate, jasmine, nerium, etc.

(c) Tree :



Lemon



Rose



- The trees are tall and big plants with one hard woody stem called trunk which bears woody branches, twigs and leaves.
- Branches arise at some distance above the ground.
- Trees generally survive for many years. e.g. mango, neem, palm, banyan, etc.

**Mango****Neem**

Note : Coconut and palm are also trees, though they do not contain branches.

**Coconut****Palm**

(d) Creepers :

Plants with weak stems that can not stand upright and spread on the ground are called creepers e.g. Sweet potato, pumpkin, water melon, Bottle gourd, bitter gourd.

**Water Melon****Pumpkin**

(e) Climbers :

Plants with weak stems which take support on neighboring structure and climb up are called climbers. e.g. Betel, grape, Money plants, beans, etc.

KEY POINT

- Observe the stems of a herb, tree, shrub, creeper, climber or shrub. Compare them based on features like colour, texture (smooth or rough), strength (easy or hard to break) and rigidity (can or cannot be bent easily).



- Look around your neighbourhood park or garden. Make a list of plants growing there and classify them as herbs, shrubs, trees, creepers and climbers.

Roots System

Root

The root is a very important component of the plant system, as, without the presence of roots the plant ceases to exist. This is because the roots perform three major functions essential to the growth and survival of the plant which are:

- Roots are responsible for absorbing minerals and water from the soil and transferring them to the stem. It's only after root has transported water and minerals to stem that the stem becomes capable of transporting these to all parts of the plant.
- Another important function of roots is to firmly anchor the plant in the ground. This is essential to support the upright position of the plants.
- Roots also perform the function of storing important nutrients and food for growth.
- Root system is the underground, nongreen part of a plant. It consists of primary root and its branches
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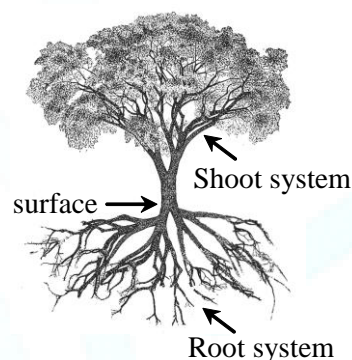
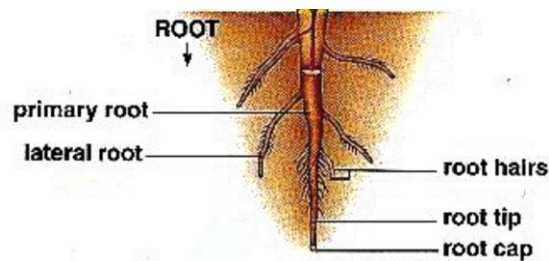
(i) Characteristics of Roots :

- They develop from the radicle of the seed.
- They grow towards soil and water.
- They grow away from sunlight.
- They do not have nodes and internodes.
- They have many lateral branches, called secondary and tertiary roots.

(ii) Function of Root :

- The main functions of the root is to absorb water and nutrients from the soil for the plant.
- This water is used by the leaves to make food.
- Another main function of the root is to bind the plant to the soil and prevent it from being uprooted. This is called anchorage.

- In some plants, roots perform the special function of storing food. Such roots can be seen in a carrot, radish and sweet potato.

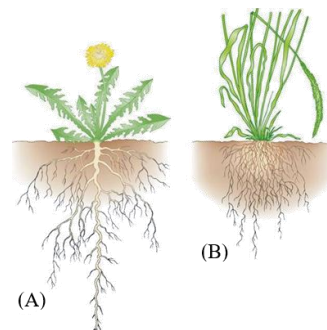


(iii) Part of Roots :

- Primary root** it is the main root. It develop from the radicle. It is thick and grows straight into the soil.
- Secondary root** the side branches arising from the primary root are called secondary roots.
- Tertiary roots** The branches of secondary roots are called tertiary roots.
- Root Cap** The tip of each branch of the root has a protective cap-like structure. It protects the dividing soft tissue when root branches push their way through the soil.
- Root Hair** Root and its branches are covered with the fine root hair. They help in the absorption of water and minerals from the soil.

(iv) Types of Root System

Root systems are of two types



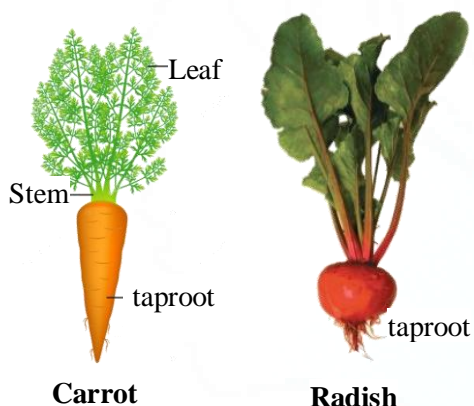


(A) **Taproot System** : In this system, primary root is thick and long. It grows vertically downwards in the soil. It is also called the true root. Taproot is found in dicot plants, for example Mustard, Gram, Bean, Pea, Mango, Carrot, Radish, etc.

(B) **Fibrous Root System** : In this system, primary root is short-lived. It is replaced by a cluster of fibre-like roots. All the branches arise from the base of stem and spread out in the soil. Fibrous roots are found in monocot plants, for example, Maize, Wheat, Rice, Barley, Grasses, etc.

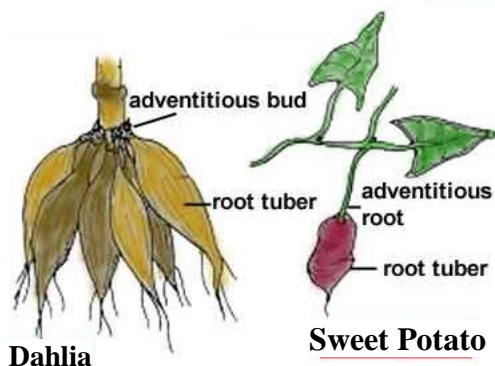
(v) **Modifications of Roots**: In some plants, roots are specialised to carry out some other functions besides anchorage and absorption. These specialised functions are :

(A) **Storage of Food** the taproots of Radish, Turnip, Beetroot and Carrot store food. So, they are swollen and fleshy.



Carrot

Radish



Dahlia

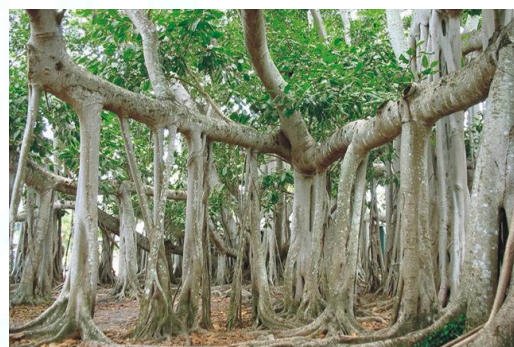
Sweet Potato

(B) **Support** some roots provide support to the plant. The supporting roots are of two types: Stilt roots and Prop roots.

- **Stilt roots** In Bamboo, Maize and Sugarcane, adventitious roots arise from the lower nodes and grow downwards. They provide additional support to the plant.



Stilt Roots



Prop Roots

- **Prop roots**: In Banyan and Rubber tree, additional roots grow downwards from their horizontal branches. These rope-like roots are called prop roots. They penetrate into the soil and act as pillars to support the heavy branches.

(C) **Climbing**: The plants of Betel, Black Pepper and Money plant have climbing roots. These roots arise from the nodes. They help the plant to stick and limb up the wall rock or other trees.




Climbing root

Parasitic root

(D) Parasitic roots: Plants like dodder have specialized roots arising from their system, which help them absorb water and nutrients from the host.

(E) Multiplication of the plant : Roots of plants like dahlia and asparagus can develop into new plants.

(F) Pneumatophores: An aerial roots specialized for gaseous exchange. Like mangroves.


Pneumatophores

(vi) Function of Roots

(A) Fixation : It fixes the plant firmly in the soil.

KEY POINT

- **Aim:** To show that roots anchor the plant in soil
- **Materials Required:** A pot, garden soil, gram seeds and water.
- **Procedure:** Take a pot filled with garden soil. Place a few gram seeds in it. Water it daily for about a week. After a week, when seeds grow, try to pull out a seedling from the pot. How much force did you need to pull it out? Keep the pot for another week. The seedlings grow into small plants. Now, try to pull a plant from the pot. How

much force did you need to pull the plant out this time?

- **Observation:** More force is needed to pull out the plant second time. This is because the root of the grown up plant is bigger than the root of seedling and has grown deep in the pot.
- **Conclusion:** It is concluded that roots anchor the plant firmly in the soil.

(B) Absorption : The root hairs help in the absorption of water and minerals from the soil.

KEY POINT

- **Aim:** To show that roots absorb water.
- **Materials Required:** A radish, glass, water, red colour and a knife.
- **Procedure:** Take a radish. Place it in a glass containing red coloured water. Leave the set-up for a day. Next day, take the radish out and cut it lengthwise.
- **Observation:** The red colour has spread throughout the radish and red-coloured tubes appear extending all along the length of the radish.
- **Conclusion:** The red colour shows the passage of water through the radish. So, it can be concluded that roots absorb water.

Stems : Structure and Function

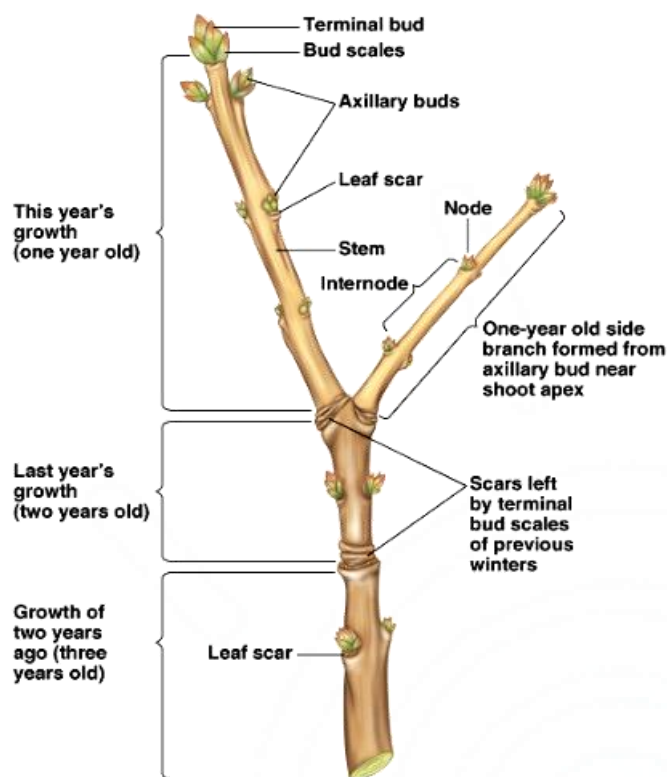
Stem

The part of the plant above the ground is called the shoot system.

The Stem is the part of a plant which is responsible for supplying water to all parts of the plant. It is the stem which bears branches, flowers, leaves, fruits and buds. The root sucks the water and minerals from the soil and it is the stem's function to push this water upward to other parts of the plant.

We can observe this by soaking the stem of a plant in a glass with water. On adding coloured ink to the water, we observe that after a while the stem and leaves of the plant start to turn the colour of the ink, which is proof that the stem carries the water to the different parts of the plant.

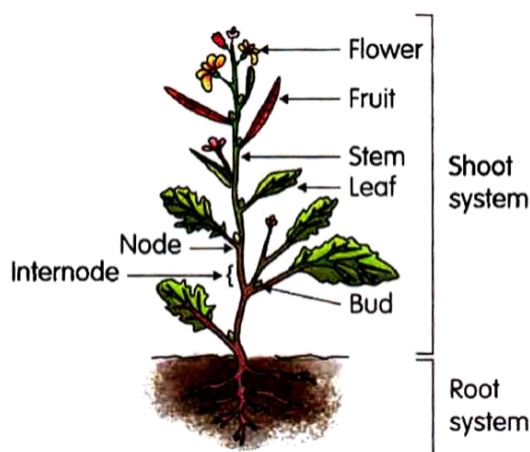




Growth cycle of a common stem

(i) Stem

- The stem is the main part of the plant.
- It provides support to the leaf and exposes them to sunlight.
- The stem is the main part of the shoot system and bears all other parts of the plant.
- It also connects different parts of the plant just like a road network connects different parts of a city.
- Stem grows towards light and away from the soil and water.
- It has nodes and internodes.

**(A) Characteristics of Stem :**

- Stem grows towards light and away from the soil and water :
- It has nodes and internodes.
- Stem bears leaves, branches, buds, flowers and fruits.
- The axillary buds give rise to new branches.
- Young stems are green but older and woody stems are nongreen and hard.

(B) Function of Stem: The main functions of a stem are :

- Support Stem supports branches, leaves, flowers and fruits. It keeps leaves spread out so that they can get enough sunlight.
- Conduction of Water and Food : Stem transport water and minerals absorbed by the roots to different parts of the plant. It also conducts food manufactured in leaves to other parts of the plant.

Note : The process of carrying food and water in plants from one part to the other is called conduction.

KEY POINT

- Aim: To show that water is conducted through them materials required: A glass, water, red ink and a twig with white flower



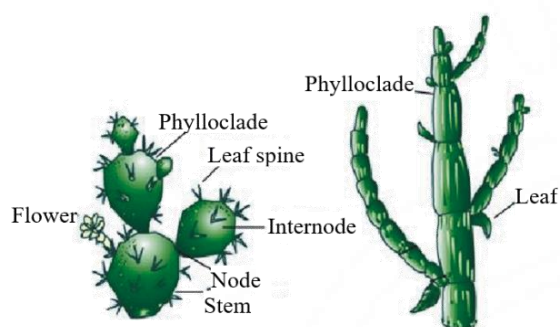
Balsam stem

- Procedure: Take a glass and fill one-third of it with water. Add a few drops of red ink in it and stir well. Now, cut obliquely a twig from a plant having a white flower (like Petunia or Balsam) and put it in the glass. Leave the set-up overnight. Observe carefully the next morning.
- Observation: Petals of lower and veins of the leaves have become red.
- Conclusion: The shows that red-coloured water has travelled up through the stem into leaves and flowers. The thin red-coloured lines are xylem vessels through which water travels from roots to different parts of the shoot.



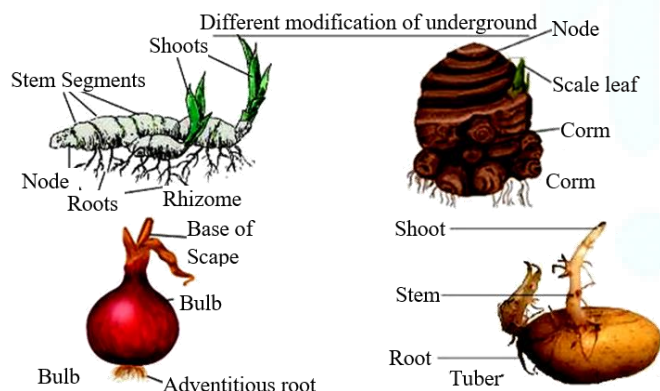
(C) Modifications of Stem: In certain plants, stem is modified to carry out special functions besides, support and conduction. These functions are :

(i) Manufacture of Food: The green stem of annual plants synthesises food by photosynthesis. In cacti and succulents, the stem becomes green and leaf-like to make food.

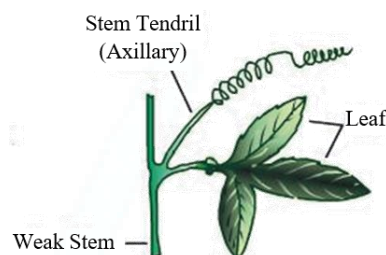


(ii) Storage of Food : Stem store food.

- **Rhizome :** in Ginger, the underground stem swells up in an irregular form and is called rhizome. It has nodes, internodes, buds and scaly leaves.
- **Tuber :** Some stem have swollen underground structures. Used as storage organs for nutrients reserved, which help the plant to survive winter or adverse conditions. It might also have buds. e.g. potato. Corms are special tubers with rounded and condensed structure covered with scaly leaves. e.g. Gladioli and Zimikand.
- **Bulb :** In Onion, Garlic Lily, etc., the leaves store food and become fleshy. They overlap each other and are attached, to a disc. This disc is the reduced stem. Such modified stems are called bulbs.



(iii) Stem tendril : In some plants like Grapevine and Passion flower, the stem is weak and some of its branches are modified into thread-like structure coil around the support called Stem tendrils.



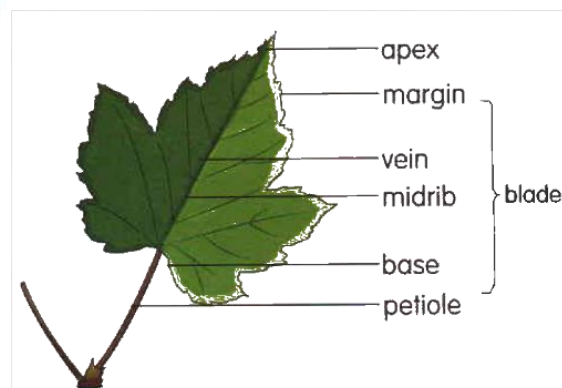
Leave

(i) Introduction

- There is a large diversity in the leaves around us.
- Different plants have different kinds of leaves which vary in size, shape, colour, texture and other features.
- Leaves differ from plant to plant.
- Yet most leaves perform the same function for all plants.

(ii) Parts of leaf :

- **Petiole :** The parts of a leaf by which it is attached to the stem is called petiole.
- **Lamina :** The broad green part of the leaf is called lamina
- **Midrib :** A thick vein in the middle of the leaf is called the midrib.
- **Veins :** Lines on the leaf are called veins.

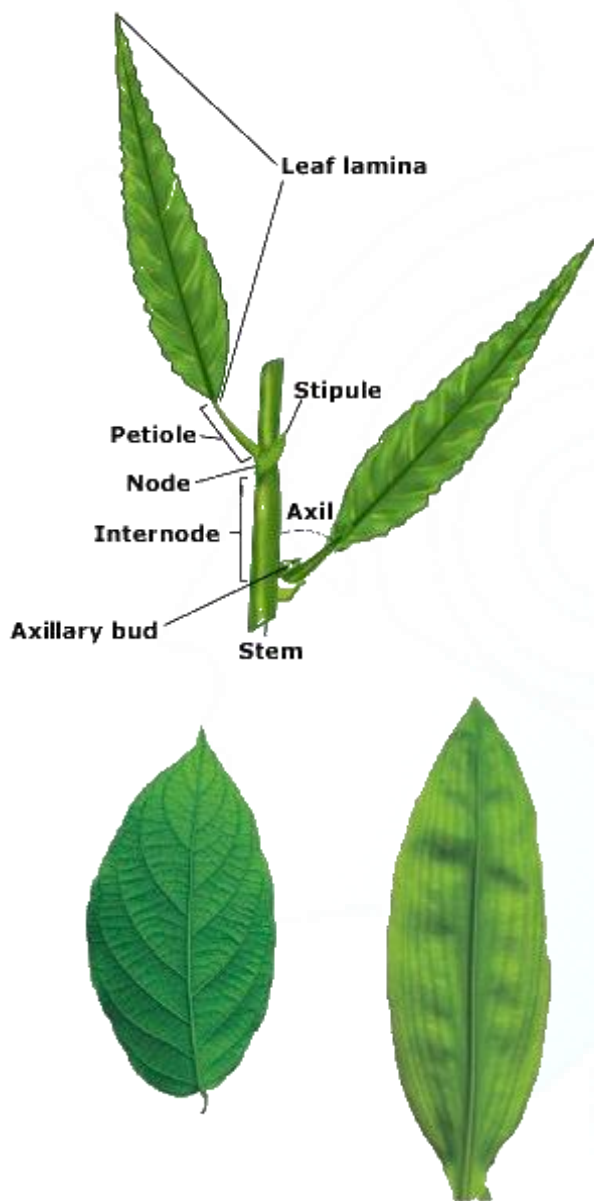


NOTE:

LEAF VENATION : The design made by veins in a leaf is called the leaf venation



- **Reticulate venation** : If leaf design made by veins in a leaf is net like on both sides of midrib the venation called Reticulate.eg. Leaves of Mango, Pea etc.
- **Parallel venation** : If veins are parallel to one another in a leaf then venation called parallel venation. eg. leaves of grass.



Function of leaves

- **Transpiration**: It is the process of evaporation of water from the surface of leaves.
- **Photosynthesis**: Green leaves synthesize food with the help of sunlight, air and water by a process called photosynthesis

(i) Photosynthesis

- Most of the functions of the leaf are carried out by the leaf blade.

The most important function of a leaf is photosynthesis. Photosynthesis is the process by which green leaves make food for the plant using carbon dioxide and water in the presence of sunlight and chlorophyll.

- The leaves take in carbon dioxide for photosynthesis from the air. They obtain water from the roots through the stem. Chlorophyll, the green pigment that makes leaves green, helps leaves absorb sunlight.
- Chlorophyll is present in all green leaves. Leaves are often broad so that they have a larger surface area. Broader leaves enable more sunlight to be absorbed.
- Carbon dioxide and water undergo a chemical reaction to produce food for the plant. Leaves manufacture food in the form of glucose. This gets converted to starch and is transported to other parts of the plant. During this process, along with glucose, oxygen is also formed. The plant needs some oxygen for cellular respiration; the excess or unneeded oxygen is released into the air from stomata.
- The process of photosynthesis can be summarised as:



Thus, sometimes leaves are referred to as 'food factories' or the 'kitchens' of plants.

(ii) Transpiration

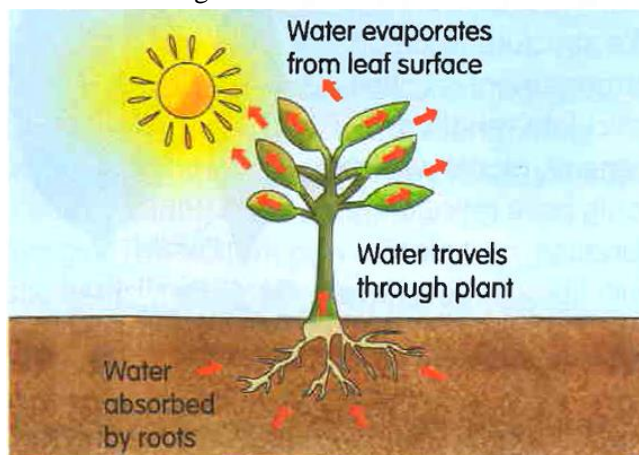
Leaves perform another important function called transpiration. Transpiration is the process by which plants remove excess water. The excess water exits the leaves through stomata. Stomata are the pores or openings on the surfaces of a leaf. Leaves have many stomata (plural). One pore or opening (singular) is called a stoma. Plants usually have more stomata on the bottom of their leaves. When the stomata are open,



excess water is able to exit the leaves. At the same time, the leaves also take in carbon dioxide from the air. Oxygen from photosynthesis is also being released.



Transpiration is an invisible process since water vapour, carbon dioxide and oxygen are invisible gases. Transpiration allows a great deal of water vapour to return to the atmosphere and continue its journey in the water cycle. Transpiration also plays an important role in plants. It produces an upward, pulling force in plants which helps the plant's roots to absorb more water. It also helps to prevent plants from overheating.



KEY POINT

Select two or more leaves on the lower branches of a tree or any other plant. Lie a transparent colourless polythene bag on the two leaves. Predict what you

will see in the bag after a few days. Observe and record your findings. Was your prediction correct?



Why do water droplets begin to form on the inside of the bag?

How come water droplets are not typically seen on the surfaces of plant leaves? Do not consider dew drops or rain drops in your answer.

Flower

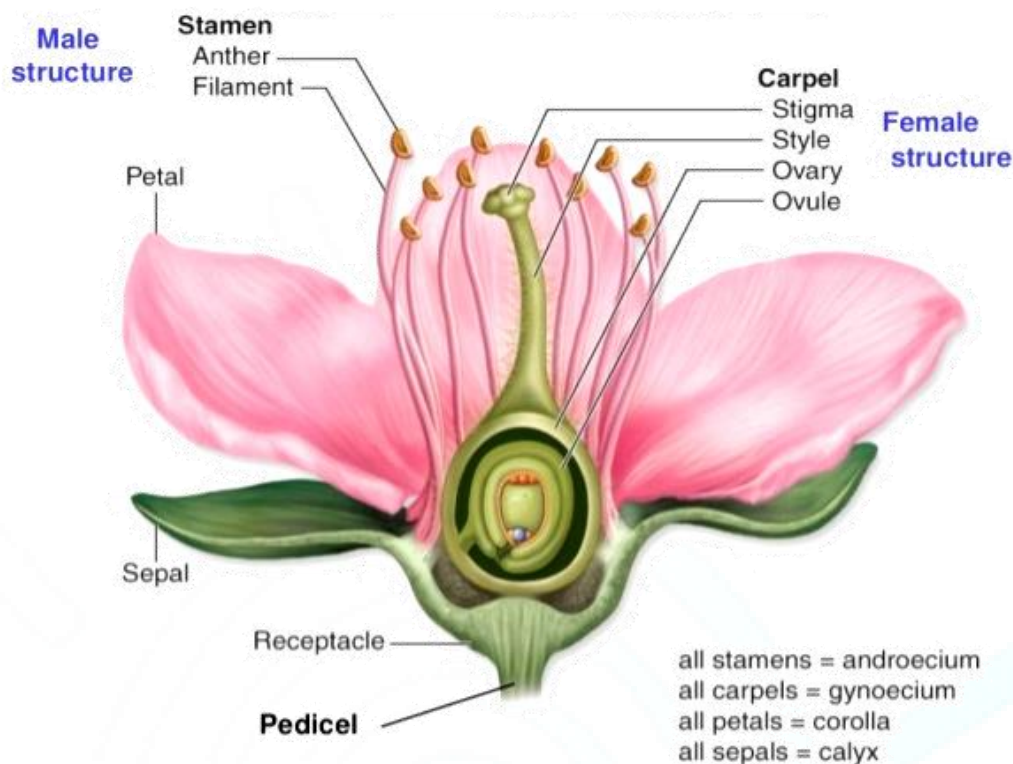
(i) Introduction

Flowers are the bright, colourful and fragrant parts of the plant which attract our attention when we visit a garden or a park. Many plants can be identified by observing and examining the plant's flowers.

A flower may be defined as a modified shoot in which nodes and internodes are highly condensed. It develops from the floral bud. The Flower is the site of sexual reproduction in plants.

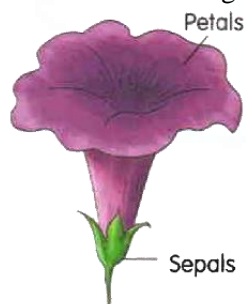
(ii) Parts of a Flower : Flowers vary in size, shape and colour but all flowers have the same basic parts.

- Pedicel and Thalamus
- Calyx
- Corolla
- Androecium / stamen / Male Reproductive organ
- Gynoecium / Pistils/ Female Reproductive organ.

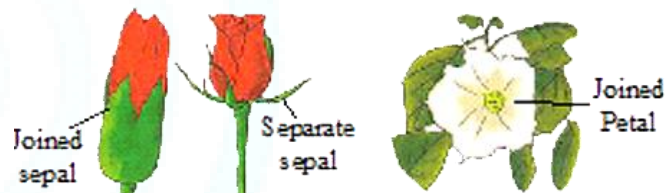


(iii) **Outer Parts of a Flower :** The outer parts of flowers are made of sepals and petals.

- **Sepals:** The outermost, bottom parts of a flower are called sepals. These are the green, leaf-like structures found below the petals. Sepals cover and protect the flower when the flower is still in its bud stage.

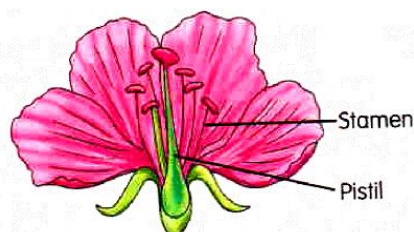


- **Petals:** The most prominent parts of a flower are the petals. Many flowers have big and colourful petals. Petals are brightly coloured due to the presence of coloured pigments. The colourful petals attract insects which help to pollinate the flowers. Plants cannot produce seeds unless pollination happens in plant flowers.



Different flowers have different types of sepals and petals. Some flowers such as the China Rose have joined sepals while other flowers such as the Common Rose do not. Similar to joined sepals, the petals of flowers can be joined too. For example, the Datura flower has joined petals.

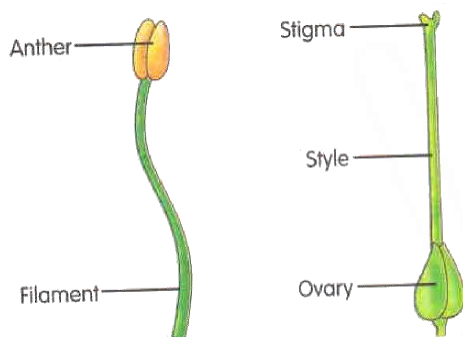
(iv) **Inner Parts of a Flower :** The inner parts of a flower consist of the stamen and the pistil or carpel.



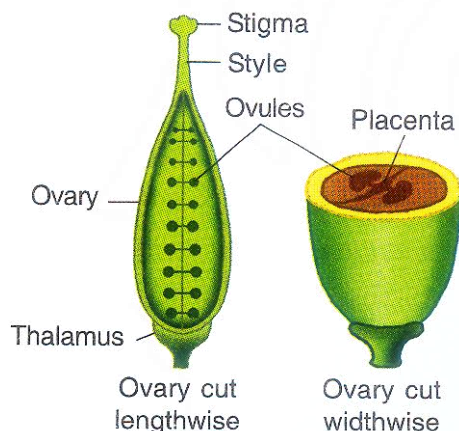
- **Stamen:** It is the male part of the flower. It is divided into two parts - a long tubular filament and a swollen portion at its tip



called the anther. The anthers produce yellow, powdery structures called pollen grains. Pollen contains the male gametes.



- **Pistil or Carpel:** It is the innermost part of the flower. This is the female part. It is divided into three parts - a flat sticky portion at the tip called the stigma, a cylindrical stalk called style and a swollen base called the ovary.



Each pistil usually consist of three distinct parts :

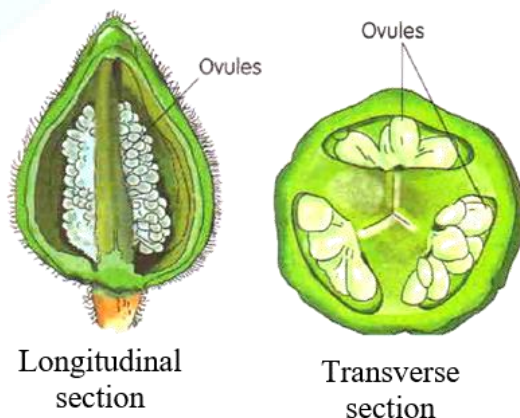
- **Ovary** • **Style** • **Stigma**
- **Ovary :** It is a basal swollen part of the pistil. The ovary bears the ovules on a raised tissue called the placenta. Each ovule contains the female reproductive cell.
- **Style :** From the top of the ovary arise a long elongated structure which connects the stigma with ovary. It is meant for raising the level of the stigma.
- **Stigma :** The terminal end of style is called as stigma. The stigma is normally rough, hairy and sticky. It is meant for receiving pollen grains during pollination.

Note : The number and types of stamen vary from flower to flower. Some flowers have fewer stamens, and some flowers have more. Stamens can also be large or small. Similarly, the number of pistils can vary from flower to flower.



- (v) **Structure of the Ovary :** The ovary is the swollen sac-like base located at the bottom of the pistil. It is made of tiny beadlike structures called ovules. The ovules contain the female gametes. The ovary is divided into chambers or segments in which the ovules are stored. To observe the ovules and how they are arranged, the ovary can be dissected or cut open using two different methods.

- **Longitudinal section:** In this method, the ovary is cut vertically or longitudinally. The ovules can be observed in the chambers in vertical rows.



- **Transverse section:** In this method, the ovary is cut horizontally or transversely. The ovules can be seen arranged in the chambers radially or in a circular pattern.

**(vi) Types of flowers:**

- **Complete Flowers:** Flower with all the four whorls are called complete flowers, e.g., China rose, Mustard, Rose, Pea etc.
- **Incomplete Flowers:** Flowers having one of the four whorls missing are called incomplete flowers, e.g., Pumpkin, Water melon, Wheat, Grass etc.

(vii) Functions of flower :

- Flowers are reproductive organs of the plant.
- The ovary of a flower develops into fruit and its ovules form the seeds.
- The nectar of flowers is collected by honey bees to prepare honey.
- Perfumes are prepared from flowers.
- Cloves are dried flower buds. These are used for adding flavor to the food and for preparing several ayurvedic medicines.

Important Definitions

Stomata: These are the small microscopic pores present on the leaf through which exchange of gases and transpiration takes place.

Annuals: These are plants like wheat and maize that complete their life cycle in one season and then die. They are usually herbs.

Biennials: These are plants like carrots and radishes that complete their life cycle in two seasons.

Perennials: These are plants guava and palm that continue their life cycle for more than two seasons, i.e. they manage to re-grow every spring.

FUNDAMENTAL UNLOCKED- (FU#1)**Roots**

- Q.1** Why desert plant have relatively longer roots?
Q.2 Can bamboo grow over 60 cm. in just one day?
Q.3 What are Halophytes ?
Q.4 Do you know what are adventitious roots ?
Q.5 What is the white part seen coming out of sprouts?

Stems

- Q.6** Do stems have pore ?
Q.7 Is the stem of shrubs and trees dead or living ?
Q.8 Is sweet potato a stem or a root ?
Q.9 Can you name a type of edible cactus ?

Q.10 What are stolons ?**Leaves**

- Q.11** What can you tell about venation by looking at the seed ?
Q.12 Which surface of leaf has more no. of stomata ?
Q.13 Can plants carnivorous ?
Q.14 Can you name one plant whose no part goes waste?
Q.15 Can mushroom be called as plant?

Flowers

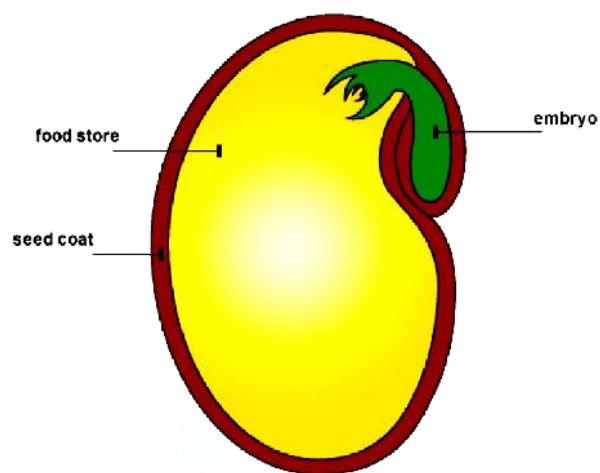
- Q.16** Do birds also transfer pollens ?
Q.17 What are unisexual and bisexual flowers ?
Q.18 Can a flower contain more than one carpel?
Q.19 Which part of plant is dried and used as saffron ?
Q.20 Study different types of flowers in your neighborhood. Record your observations in the format given below. (NOTE: When choosing flowers to study, avoid using Marigold, chrysanthemum and sunflower.) ?

Name of the flower	Does the flower have a smell ?	Colour of the petals	Number of		
			Petals	Sepals	Stamens



Add to Your Knowledge

- Oxygen and water are produced as a result of photosynthesis in plants.
- Monocots have fibrous roots whereas Dicots have tap roots.
- **Essential and Nonessential Whorls :** Stamens and pistil form the essential whorls of the flower. These are the male and female reproductive organs of the flower and are directly involved in reproduction. On the other hand, calyx and corolla are accessory or nonessential whorls of the flower because these are not associated directly with the reproduction.
- **Pollination:** Process of transfer of pollen grains from anther to stigma is called Pollination. There are two types of pollination.
- **Self pollination:** When pollengrain is transferred from anther to stigma of the same flower.
- **Cross pollination:** When pollengrain is transferred from anther to stigma of the different flower.
- **Fertilization:** Fertilization is a process of fusion of male gamete with the female gamete.
- Pollen grain contain two male gametes.
- After Fertilization ovule changes into seed and ovary wall change into fruit wall.
- At maturity wall of ovules changes into seed coat of which outer one is hard and is known as testa, while inner one is called as tegmen.
- Seed has two parts cotyledon (Store food), and embryo which forms Radicle (future root) and plumule (future shoot).
- Seed dispersal is movement or transport of seeds away from the parent plant. There are five modes of seed dispersal : Wind, water, animal, explosion and gravity.



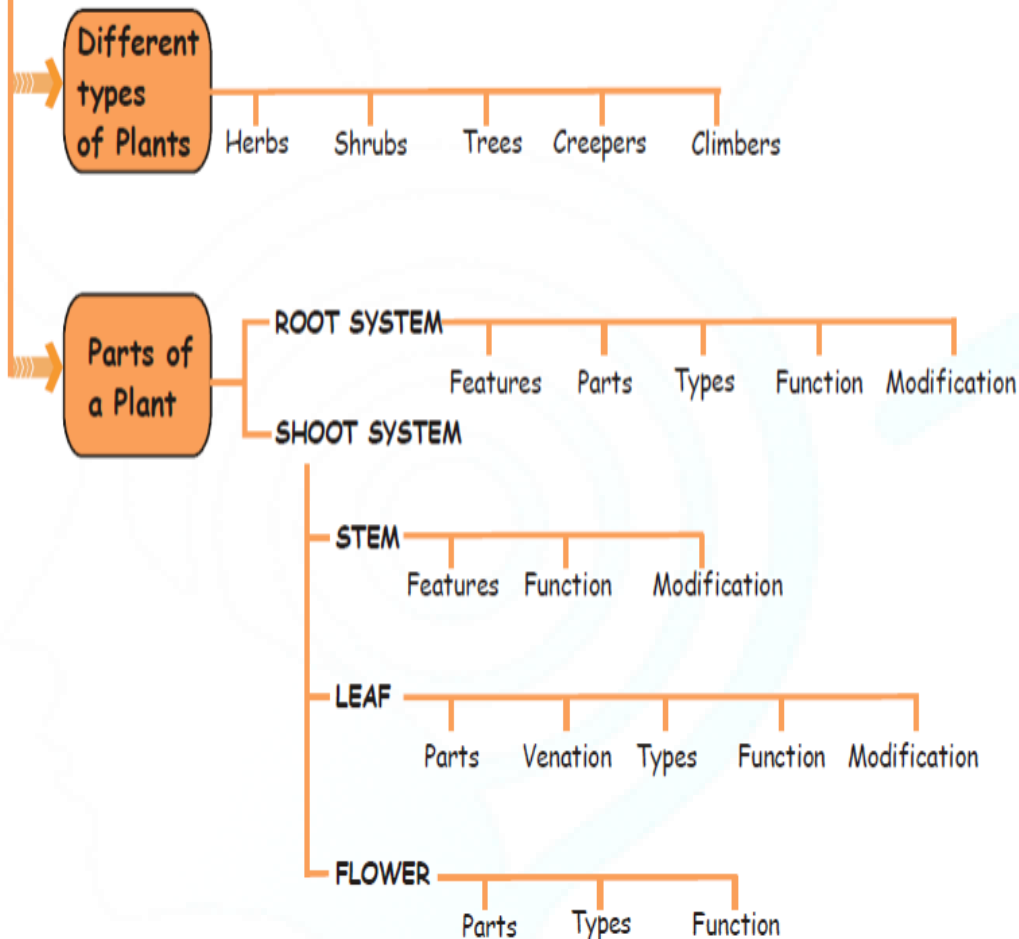
Summary/What We Learned So Far?

- Plants are generally classified into herbs, shrubs, trees, creepers, and climbers based on their height, types of stems and level of branches.
- Roots are made of one primary root and its branches called secondary roots and its branches called tertiary roots.
- Each branch of root has root hairs which absorb water and minerals from the soil and bind the plant firmly in the soil.
- Roots are mainly of two types: tap root and fibrous roots.
- The shoot consists of stem, leaves, flowers and fruits.
- A stem connects and conducts water and minerals from roots to all parts of a plant.
- A leaf has a petiole, a lamina with central midrib and veins.
- The pattern of veins on the leaf can be reticulate or parallel.
- Plants having leaves with parallel venation have fibrous roots while plants having leaves with reticulate venation have tap roots.
- Green plants make their own food by the process of photosynthesis using carbon dioxide and water, with the help of chlorophyll, in the presence of sunlight.
- Excess of water is given out in the form of vapour through the process of transpiration.
- The parts of a flower are pedicel and thalamus. Latter bears the 4 whorls calyx (sepals), corolla (petals), androecium (stamens), and gynoecium (pistils)

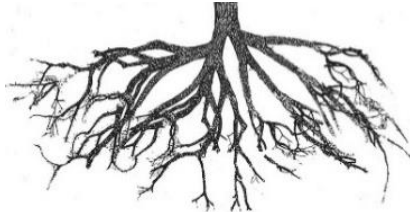


Chapter map

GETTING TO KNOW PLANTS




EXERCISE - I
SINGLE CORRECT TYPE QUESTIONS

1. The thick, woody stem of trees:
(A) Node (B) Trunk
(C) Scale (D) Internode
2. Which of these trees do not contain branches:
(A) Coconut (B) Apple
(C) Papaya (D) Mango
3. Which of these plants store food in their roots ?
(A) Balsam (B) onion
(C) Carrot (D) Zinnia
4. Which part of plant conducts food ?
(A) Stems (B) Roots
(C) Leaves (D) Flowers
5. Which one of the following has tap root ?
(A) Wheat (B) Rice
(C) Maize (D) Pea
6. The part of the plant that take part in photosynthesis is:
(A) Stem (B) Leaf
(C) Flower (D) Root
7. The leaves of which of the following plants have reticulate venation ?
(A) Wheat (B) Maize
(C) Rose (D) Rice
8. Green, leaf-like structures at the base of the flower:
(A) Petals (B) Sepals
(C) Stamens (D) Anthers
9. The male reproductive organ of a flower is the:
(A) Pistil (B) Stamen
(C) Pollen grain (D) Ovule
10. Female reproductive parts of a flower:
(A) Stamens (B) Pistils
(C) Petals (D) Sepals
11. Which part of a flower turns into a fruit ?
(A) Sepals (B) petals
(C) Ovary (D) None
12. Prop roots are present in:
(A) Rice (B) Sugarcane
(C) Maize (D) Rubber
13. Breathing roots are present in
(A) Pea (B) Mango
(C) Sugarcane (D) Mangroves
14. A plant having parasitic roots:
(A) Radish (B) Dodder
(C) Rice (D) Banyan
15. Which of these does not have nodes and internodes:
(A) Ginger (B) Turnip
(C) Rose (D) Palm tree
16. Tiny pores on the surface of leaves are:
(A) Lenticels (B) Stomata
(C) Cuticle (D) Buds
17. In which plant does the stem perform the function of a leaf ?
(A) Boganvillea (B) Onion
(C) Cacti (D) Potato
18. Anthers contain
(A) pollen grains (B) ovules
(C) ovary (D) petals
19. When pollen is transferred from anther to stigma of flower the process is called.
(A) Fertilization (B) Fusion
(C) Pollination (D) germination
20. A type of stem:
(A) Potato (B) Carrot
(C) Beetroot (D) Turnip
21. Which of the following plants would have a root structure similar to one shown in the figure given below ?

(A) Marigold (B) Mango
(C) Paddy (D) Balsam





22. Study the diagram given below.



Which labelled arrow represents the movement of oxygen?

- (A) P (B) Q
(C) R (D) S

FILL IN THE BLANKS

- _____ is the male reproductive part of the flower.
- Zimikand is a type of _____.
- Leaves are green as they contain _____ pigment.
- Plants with fibrous roots have _____ venation.
- Ovule grows in the _____.

TRUE / FALSE

- Root cap is present on tip of each branch of root.
- Fibrous roots are found in most of the Dicot.
- Rice plant has fibrous root system.
- Bamboo has prop roots.
- Stem grows from the plumule of the embryo of a seed.
- The broad green part of the leaf is called lamina.
- The leaf is called “the food factory” of a plant.



**EXERCISE - II****VERY SHORT ANSWER TYPE QUESTIONS**

1. Name the two main organ systems in plants.
2. Name any two functions of roots.
3. Name any two modifications of roots along with their functions and examples.

SHORT ANSWER TYPE QUESTIONS

4. With the help of diagrams, describe the two basic root systems found in plants.
5. Write any two functions of the stem.
6. What are the main parts of the shoot system ?
7. What is leaf venation? Name its types.

LONG ANSWER TYPE QUESTIONS

8. Describe the structure of a root with the help of a labelled diagram.
9. Describe the functions of a leaf with the help of a labelled diagram.
10. Describe the parts of a typical flower with the help of a diagram.

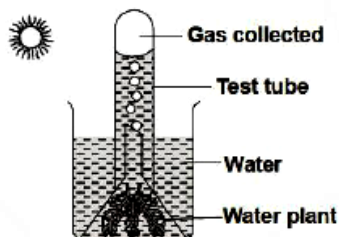




EXERCISE - III

PREVIOUS YEAR QUESTIONS

1. Smita set up an apparatus as shown in the given figure. After keeping the apparatus for some time in the Sun, she found that some gas has collected in the top part of the test tube. Which gas could it be ?



- (A) Oxygen (B) Hydrogen
(C) Carbon dioxide (D) Nitrogen

2. Given below are three statements (a-c) each with one or two blanks. Select the option which correctly fills up the blanks in two statements.

- (a) In cacti, the (i) is thick, fleshy and green. It carries out photosynthesis.
(b) The male reproductive part of a flower is (i).
(c) The coloured (i) of a flower attract insects for (ii)

- (A) (a) - (i) Root, (b) - (i) Pistil
(B) (b) - (i) Stamen, (c) - (i) Petals, (ii) Pollination
(C) (a) - (i) Root, (c) - (i) Sepals, (ii) Food
(D) (a) - (i) Root, (b) - (i) Stamen

3. Which of the following is incorrect regarding herbs, shrubs and trees ?

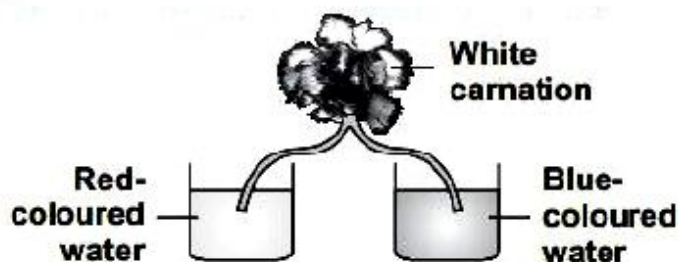
- (A) **Herbs** – (Tomato)
Shrubs – (Lemon)
Trees – (Mango, guava)
(B) **Herbs** – (Usually short)
Shrubs – (Medium sized)
Trees – (Tall in size)
(C) **Herbs** – (Plants with hard stem, not very thick)
Shrubs – (Plants with green and tender stems)
Trees – (Plants with thick brown stem)

- (D) **Herbs** – (Branches are few)

Shrubs – (Stem branches out near base)

Trees – (Stem branches out in the upper part)

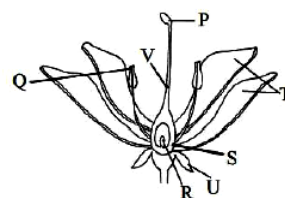
4. Shruti took a white carnation flower and split its stalk halfway along the length and arranged a setup as shown in the given figure. After some time, she observed that half of the petals turned blue and half turned red. A section through stem also showed blue and red coloured areas.



What can she infer from this experiment ?

- (A) Stem conducts water to all plant parts.
(B) Stem has localized structures for conduction of water.
(C) Stem conducts solutes along with water.
(D) All of these

5. Refer the given figure of different parts of a typical flower and select the correct statements regarding it.



- (i) After pollination, 'S' swells up and changes into a fruit and 'R' changes into a seed.
(ii) 'P' contains pollen grains.
(iii) The pollen grains are transferred from 'Q' to 'P' in self-pollination.
(iv) 'U' is brightly coloured and scented to attract insects that help in reproduction.
(v) Different flowers have 'T' of different colours.
(vi) 'P', 'V' and 'S' form the innermost part of a flower called pistil.



- (A) (i), (ii), (iv) and (vi)
- (B) (i), (iii), (v) and (vi)
- (C) (ii) and (v)
- (D) (iii), (iv) and (vi)

6. Refer the given three plants P, Q and R.



Which of the following is a suitable statement for the given plants?

- (A) P and R produce food, while Q does not
- (B) P and Q produce oxygen, while R does not
- (C) P is a shrub, Q is a herb, while R is a tree
- (D) Leaves of P and Q show parallel venation, while that of R shows reticulate venation

7. He is known as 'Father of Green Revolution.' He produced a high yielding, disease resistant wheat variety and was awarded Nobel Peace Prize in 1970 because of his contributions to world peace by helping to reduce scarcity of food. Who is he ?

- (A) Dr. Verghese Kurien
- (B) Hilaire de Chardonnet
- (C) Norman de Kazimodke
- (D) Norman Ernest Borlaug

Direction (Q.8 & 9): Refer the given passage and answer the following questions.

In some plants, leaves get modified to perform different functions. For example, in insectivorous plants such as pitcher plant, the leaf is modified to form a pitcher for capturing insects. These plants have green leaves as well. They grow in regions where the soil is deficient in nitrogen.

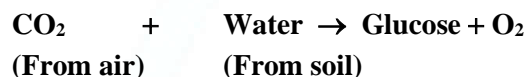
8. Which of the following statements is incorrect regarding this ?

- (A) Photosynthesis that occurs in the green leaves of these plants, produces carbohydrates as their food source.

(B) Photosynthesis does not occur in these plants as they depend only upon insects for their food

(C) To harvest nitrogen necessary for their growth and development, these plants trap insects and digest them.

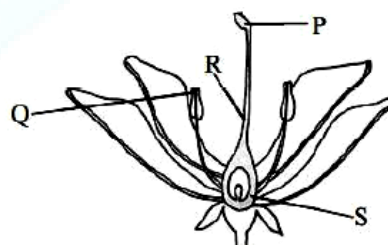
(D) Insectivorous plants prepare their food by the following reaction:



9. Which of these sets of two different pots (P and Q) should one select to carry out a starch test in order to prove that insectivorous plants are photosynthetic ?

- (A) **Pot P** - Plant covered within netted container without insects
Pot Q - Plant covered with in netted container with insects
- (B) **Pot P** - Plant in sealed wooden container
Pot Q - Plant in sealed glass container
- (C) **Pot P** - Plant watered everyday
Pot Q - Plant watered every 3rd day
- (D) **Pot P** - Plant with fertilizer
Pot Q - Plant without fertilizer

10. Identify the parts labelled in the given figure. Match them with their respective functions and select the correct option.



- (A) P - Anther - Transfer of pollen grains
- (B) Q - Stigma - Receives pollen grains
- (C) R - Style - Transfer of ovule
- (D) S - Ovary - Involved in fertilization

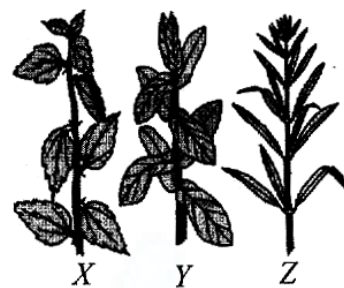
11. Which of the following features are useful for desert plants?

- (A) Leaf hairs
- (B) Large flat leaves
- (C) Needle like leaves
- (D) All of these

12. X is a stem modified to store food, while Y is a stem modified to make food. X and Y are respectively

(A) Cactus and sweet potato
 (B) Onion and potato
 (C) Ginger and cactus
 (D) Dahlia and ginger.

13. Phyllotaxy is the arrangement of leaves on the stem. Identify the three types of phyllotaxy shown in the given figures, X, Y and Z.



X

Y

Z

A. Alternate	Opposite	Whorled
B. Opposite	Whorled	Alternate
C. Whorled	Alternate	Opposite
D. Opposite	Alternate	Whorled


ANSWER KEY
EXERCISE– I
SINGLE CORRECT TYPE QUESTIONS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	B	A	C	A	D	B	C	B	B	B	C	D	D	B	B
Que.	16	17	18	19	20	21	22								
Ans.	B	C	A	C	A	C	B								

FILL IN THE BLANKS

1. Androecium
2. Corm
3. Chlorophyll
4. Parallel
5. Ovary

TRUE / FALSE

1. True
2. False
3. True
4. False
5. True
6. True
7. True

EXERCISE– III
PREVIOUS YEAR QUESTIONS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13		
Ans.	A	B	C	D	B	D	D	B	C	D	C	C	C		

