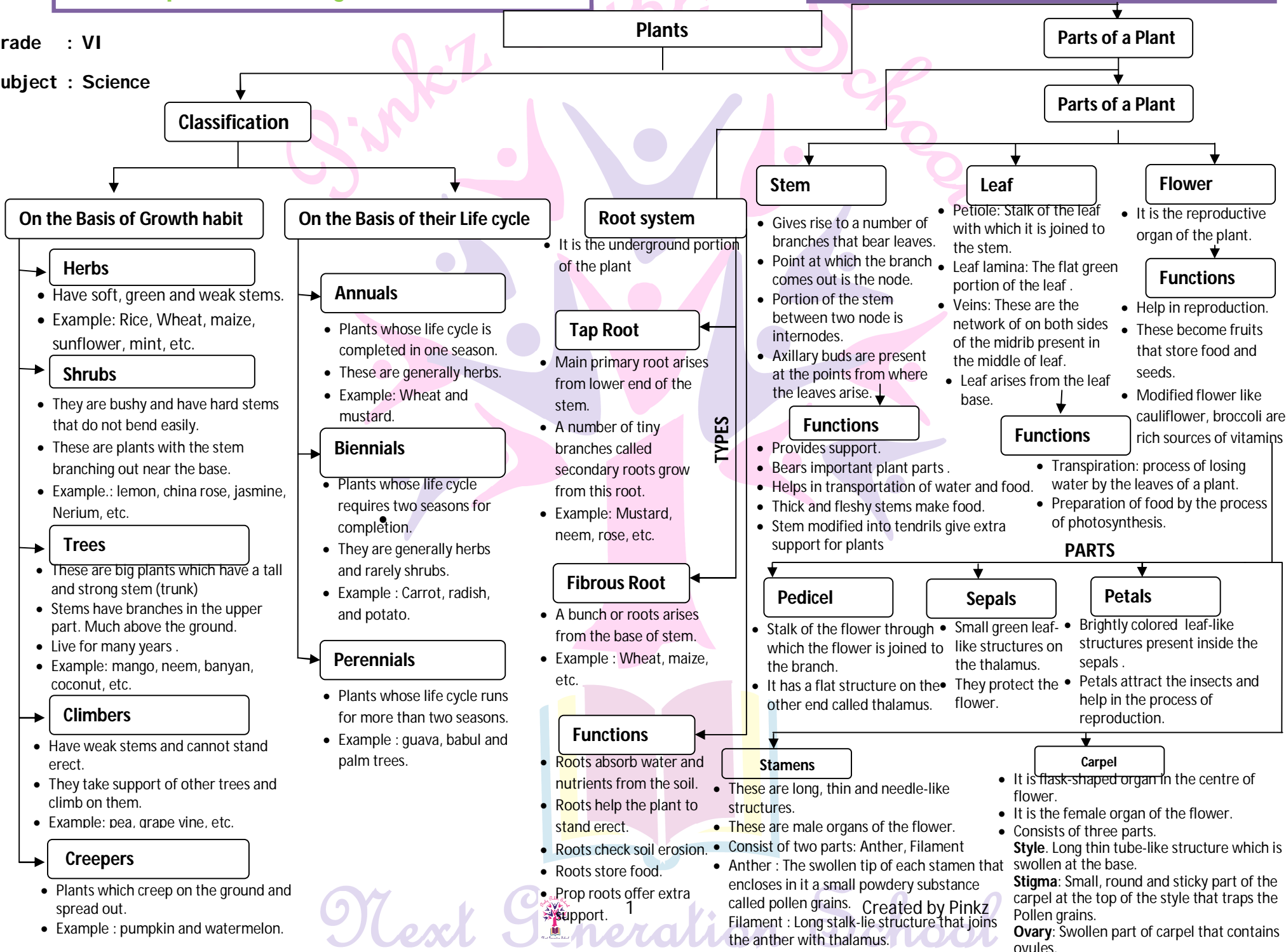


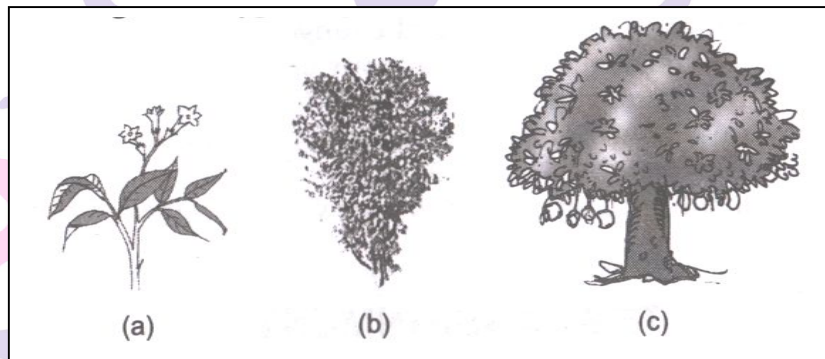
Grade : VI

Subject : Science

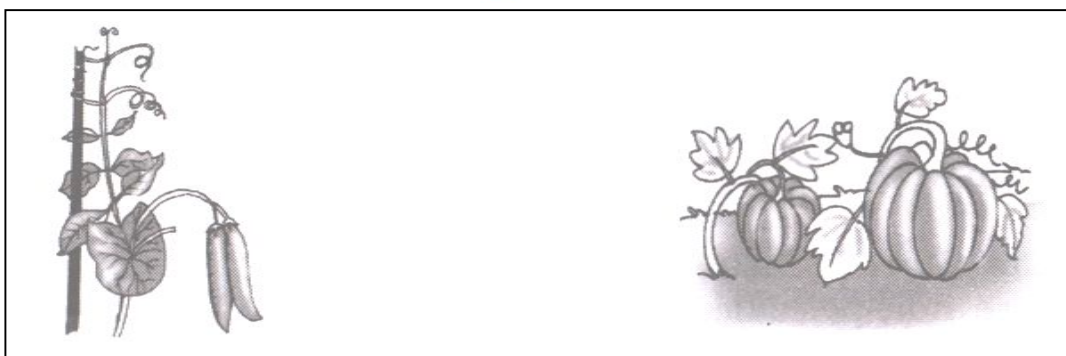


## I. Know the Terms

- **Contraction:** It is a phenomenon in which a substance shrinks or changes its shape.
- **Herbs:** The small plants with soft/tender, green, shorter stem are called herbs. Herbs hardly attain height more than 1.5 metres. Their stems are not woody and can be bent. A herb may or may not have branches, e.g. tomato, mint, paddy, mustard, etc.
- **Shrubs:** The medium-sized plants with hard and partly woody stem are called shrubs. Branches arise mostly from the base of the stem giving the plant a bushy appearance without a clear trunk, e.g. china rose, duranta, lemon, jasmine, bougainvillea.
- **Trees:** Trees are very tall plants with height of several metres. They have stout trunks which mostly bear branches near the top. The trunk is very hard and woody, e.g. mango, eucalyptus, gulmohar.



- **Climbers:** Those plants that take support of neighbouring structures, as their stems are weak and climb up are called climbers. Climbers may have special organs such as hooks, tendrils and petioles that help the plant to climb, e.g. pea plant.
- **Creepers:** Some plants which have weak stems which cannot stand upright and are spread on the ground are called creepers, e.g. pumpkin, watermelon.



- **Fibrous Roots:** The roots which do not have any main root but similar to bunch of are called fibrous roots.
- **Tap Roots:** The roots in which one root is the main root and other roots branches grow on it are called tap roots.

- **Lateral Roots:** The smaller roots that grow on main root are called lateral roots.
- **Petiole:** The part (stalk) of a leaf by which it is attached to the stem is called petiole.
- **Lamina:** The broad green part of a leaf is called lamina.
- **Midrib:** A thick vein in the middle of the leaf is called midrib.
- **Veins:** The lines on the leaf are called veins.
- **Leaf Venation:** The design made by veins in a leaf is called leaf venation.
- **Sepals:** The small green coloured leaf-like structures seen in flowers are called sepals.
- **Petals:** The big coloured leaf-like structures seen in flowers are called petals.
- **Stamens:** When we remove sepals and petals then we see long filaments in a flower which are called stamens. They are the male part of a flower and contain pollen groups.
- **Pistil:** The innermost part of a flower which we cannot see completely is called pistil. It consists of stigma, style and ovary. This is the female part of a flower.
- **Ovules:** There are small bead-like structures inside the ovary called ovules.
- **Ovary:** The lowermost and swollen part of the pistil is called ovary.
- **Transpiration:** The process by which water comes out from the leaves in the form of vapour is called transpiration.
- **Photosynthesis:** The process by which green leaves prepare their food in the presence of sunlight and a green-coloured substance (chlorophyll) present in them is called photosynthesis. For this, plant needs water and carbon dioxide (from air). Oxygen is given out in this process.
- **Reticulate Venation:** When design of veins is net-like on both sides of the midrib, the venation is called reticulate venation, for example, leaves of peepal.
- **Parallel Venation:** When veins are designed parallel to one another it is called parallel venation. For example, in leaves of grass and wheat.
- **Tendrils :** Thread-like structures that are actually modification of a stem to provide additional support to weak stems
- **Stomata :** Tiny pores on the upper side of a leaf through which exchange of gases takes place.
- **Pollination :** The transfer of pollen grains from the anther to the stigma of flowers on the same plant or two different plants.
- **Root :** The part of a plant which is below the ground or in the soil.
- **Flower :** The part of a plant which contains the reproductive system.

## Objective Type Questions

(1 Mark each)

### I. Multiple choice questions

- Which of the following is a shrub ?  
(a) Tomato (b) Mint (c) Coconut (d) Lemon
- Which of the following is a climber ?  
(a) Potato (b) Grape (c) Both of these (d) None of these
- Identify the creeper from the following :  
(a) Pumpkin (b) Grape (c) Potato (d) None of these
- Transpiration takes place through :  
(a) Stomata (b) Chlorophyll (c) Midrib (d) None of these
- Androecium is which part of the flower ?  
(a) Roots (b) Male organ (c) Female organ (d) None of these
- Which of the following combinations of features would you observe in grass ?  
[NCERT Exemplar]  
(a) Parallel venation and fibrous root (b) Parallel venation and tap root  
(c) Reticulate venation and fibrous root (d) Reticulate venation and tap root
- Which of the following is the correct match between the characteristics of stem and the category of plant ?  
[NCERT Exemplar]  
(a) Weak stem which cannot stand upright : Creeper  
(b) Green tender stem : Shrub  
(c) Thick, hard stem with branching near : Tree the base  
(d) Thick, hard stem with branches high : Herb on the plant -
- Which of the following is not the primary function of stem ?  
[NCERT Exemplar]  
(a) Conduction of water (b) Photosynthesis  
(c) Formation of branches (d) Bears flowers and fruits
- Which of the following is not a correct match ? [NCERT Exemplar]  
(a) Petiole : attaches leaf to stem (b) Lamina : green flat part of leaf  
(c) Margin : gives shape to the leaf (d) Veins : transpiration
- Read the following sentences about photosynthesis :  
(i) Sunlight, carbon dioxide, chlorophyll and water are necessary.  
(ii) Oxygen is absorbed.

(iii) Leaves carry out photosynthesis.

(iv) Proteins are made during photosynthesis .

Choose the correct pair of sentences that are true to photosynthesis :

[NCERT Exemplar]

(a) (iii) and (iv)

(b) (i) and (iii)

(c) (ii) and (iv)

(d) (i) and (iv)

11. Which of the following terms constitute the female part of the flower ?

(a) Sepals, petal and stamen

(b) Stigma, style and ovary

(c) Ovary, stamen and stigma

(d) Ovary, style and stamen

12. Which part of the plant is associated with movement towards light ?

(a) Stem

(b) Root

(c) Leaf

(d) All

13. Autotrophs make food by the process of :

(a) Respiration

(b) Nutrition

(c) Photosynthesis

(d) Adaptation

1. (d)	2. (b),	3. (a)	4. (a)	5. (b)	6. (a)	7. (a)
8. (b)	9. (d)	10. (b)	11. (b)	12. (a)	13. (c)	

## II. Multiple choice questions

1. The plants having green and tender stems are called:

(a) Herbs

(b) Shrubs

(c) Trees

(d) All of these

2. The water is conducted throughout the plant by:

(a) Leaves

(b) Roots

(c) Stem

(d) None of these

3. Grape is an example of:

(a) Trees

(b) Climbers

(c) Creepers

(d) Shrubs

4. The process of formation of food by the leaves is called:

(a) Transpiration

(b) Photosynthesis

(c) Both of them

(d) None of them

5. The female part of the flower is:

(a) Stamen

(b) Sepal

(c) Petal

(d) Pistil

6. Tomato plants are

(a) Herbs

(b) Shrubs

(c) Trees

(d) None of these

7. Mango plants are

(a) Herbs

(b) Shrubs

(c) Trees

(d) None of these

8. Lemon plants are

(a) Herbs

(b) Shrubs

(c) Trees

(d) None of these

9. The part of a leaf by which it is attached to the stem is called

- (a) Petiole                      (b) Lamina                      (c) Midrib                      (d) Node

10. Part of a plant which is the main site for photosynthesis is

- (a) Petiole                      (b) Lamina                      (c) Midrib                      (d) Node

1. (a)	2. (c)	3. (b)	4. (b)	5. (d)
6. (a)	7. (b)	8. (b)	9. (a)	10. (b)

**I. True of False**

1. Stem absorbs water and minerals from the soil.
2. Roots hold the plant firmly in the soil.
3. All plants have colourful flowers.
4. Pistil is the female part of a flower.
5. In shrubs branches arise from the base of the stem.

1. False	2. True	3. False	4. True	5. True
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**II. True of False**

1. Green colour of the leaf is due to chlorophyll.
2. Photosynthesis takes place in stem.
3. Flowers transport food to various parts of a plant.
4. Bud is non bloomed flower.
5. Fruit is a matured ovary.
6. Pollen grains are stored in anthers.
7. Roots are necessary only in small plants and they are not necessary in old trees.
8. The hanging parts in banyan tree are aerial roots.
9. Sweet potato is a modified stem.
10. Carrot is a modified stem.

1. True	2. False	3. False	4. True	5. True
6. True	7. False	8. True	9. False	10. False

**I. Match the following.**

Column A	Column B
(a) Tap root	(i) Wheat and maize plants
(b) Fibrous root	(ii) Datura and gourd
(c) Joined sepals	(iii) Gram and mustard
(d) Separate sepals	(iv) Petals
(e) Corolla	(v) Aerial roots
(f) Stamens	(vi) Mustard and China rose
(g) Banyan tree	(vii) Sepals
(h) Transpiration	(viii) Anthers
(i) Pistil	(ix) Stomata
(j) Calyx	(x) Ovary

a. iii	b. i	c. ii	d. vi	e. iv
f. viii	g. v	h. ix	i. x	j. vii

**II. Match the following.**

Column A	Column B
i. Climber	a. Male part
ii. Shrub	b. Grapes
iii. Tap root	c. Parallel venation
iv. Fibrous root	d. Rose
v. Stamen	e. Reticulate venation

i. b	ii. d	iii. e	iv. c	v. a
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**III. Match the following.**

Column I	Column II
a. Flower	i. Photosynthesis
b. Leaf	ii. Anchorage
c. Stem	iii. Reproduction
d. Root	iv. Bears branches

a. iii	b. i	c. iv	d. ii
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**I. Fill in the blanks**

- The small green leaves at the base of flowers are known as \_\_\_\_\_.
- The swollen basal part of the pistil is the \_\_\_\_\_ which bears the \_\_\_\_\_.
- Stamen has two parts called \_\_\_\_\_ and \_\_\_\_\_.
- The young unopened flower is termed as \_\_\_\_\_.

a. Sepals	b. Ovary, Ovules	c. Filament, anther	d. Bud
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**II. Fill in the blanks**

- Complete the following with a suitable word/words.
  - Thick vein in the centre of the leaf is called \_\_\_\_\_.
  - The shape and size of all leaves are \_\_\_\_\_.
  - The process of loss of water from the leaves is called \_\_\_\_\_.
  - The smaller roots around the main root in a tap root are called \_\_\_\_\_.
  - \_\_\_\_\_ is the lowermost part of a pistil.

i. midrib	ii. different	iii. transpiration	iv. lateral roots	v. ovary
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## Quiz Time

1. What are weeds?
2. A plant has branches emerging from the stem just above the ground. Its stem is strong but not thick. What would be the category of this plant?
3. Why does stem of pumpkin spread on the ground?
4. Why do veins are present in the lamina of a leaf?
5. Can you observe pattern of venation in a dried leaf pasted in Herbarium?
6. Which part of the plant mainly prepares food?
7. Name the part of the flower which keeps the flower enclosed in the bud?
8. When choosing flowers to study, we should avoid flowers like marigold, sunflower and chrysanthemum. Why?
9. Did you know that some flowers have sepals and petals that look similar? Give one example.
10. What is the name of the process by which green leaves prepare food?

### Answer.

1. Unwanted plants that grow in lawns or fields are called weeds.
2. Shrub
3. The stem of the pumpkin is weak and is not woody. So, it cannot stand erect.
4. Veins have narrow tubes which bring and carry materials to and from leaf cells to stem.
5. Yes, dried leaves pasted in a Herbarium do not loose pattern of venation. We can recognise the venation.
6. Lamina of the leaf
7. Sepals
8. Because they are not single flowers, but are groups of flowers.
9. Yes, in banana sepals and petals look similar (The term used for this is called perianth).
10. Photosynthesis.

Next Generation School

Intext Question

1. What are weeds?

The unwanted plants growing in the fields are called weeds .

2. What kind of stem do the following have ?

- (a) Money plant      (b) Bean Plant      (c) Gourd plants      (d) Grape vines

Plant	Kind of stem
(a) Money plant	Thin, long and weak. The plant spreads on the ground and is called a creeper.
(b) Bean plant Weak stem.	The plant climbs up a neighbouring support and is called a climber.
(c) Gourd plants Weak stem.	The plants climb up a neighbouring support and are called climbers.
(d) Grape vines Weak stem.	The plants climb up a neighbouring support and are called climbers.

3. Write down the names of two trees, shrubs, herbs and creepers growing in your house or school.

- Trees - Ashoka and Neem  
 Shrubs - Rose and Jasmine  
 Herbs - Tomato and Carrot  
 Creepers - Money plant and Strawberry

4. Do all the leaves have petioles ?

No, all the leaves do not have petioles. Leaves without petiole are called sessile.

Textbook Questions

5. Look at figure. Who do you think is watering their plant correctly, Paheli or Boojho? Why?



I think that Paheli is watering the plants correctly. She is sprinkling water on the roots from where it can be transported to all other parts of the plant.

**6. The type of leaf venation and root in plants are related in an interesting way. Explain the statement.**

The type of leaf venation and root in plants are related in following ways :

- (a) The plants having leaves with reticulate venation have tap roots. e.g., Sunflower plant.
- (b) The plants having leaves with parallel venation have fibrous roots. e.g., Wheat.

**Textbook Question**

**1. Correct the following statements and rewrite them in your note book.**

- (a) Stem absorbs water and minerals from the soil.
- (b) Leaves hold the plant upright.
- (c) Roots conduct water to the leaves.
- (d) The number of petals and sepals in a flower is always equal.
- (e) If the sepals of a flower are joined together, its petals are also joined together.
- (f) If the petals of a flower are joined together, then the pistil is joined to the petal.

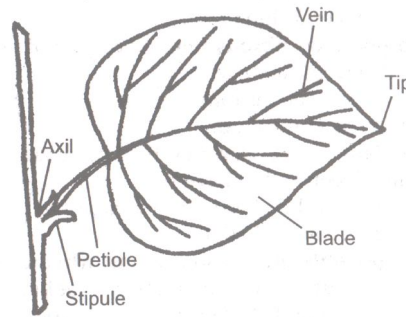
**Answer.**

The correct statements are given as below :

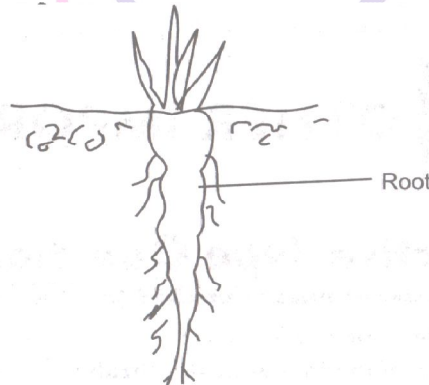
- (a) Roots absorb water and minerals from the soil.
- (b) Stem holds the plant upright.
- (c) Stem conducts water to the leaves.
- (d) The number of petals and sepals in a flower can be equal or different.
- (e) If the sepals of a flower are joined together, its petals are not necessarily joined together.
- (f) If the petals of a flower are joined together, then the pistil may or may not be necessarily joined to the petal.

2. Draw (a) a leaf (b) a taproot and (c) a flower.

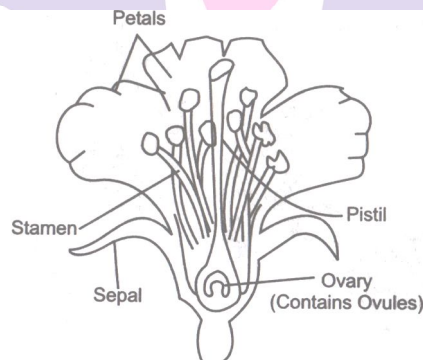
(a) Leaf :



(b) Top root:



(c) Flower :



3. Can you find a plant in your house or in your neighbourhood, which has a long but a weak stem? Write its name. In which category would you classify it ?

Yes, we can find gourd plant which needs support to climb. It is categorized as climber.

4. What is the function of a stem in a plant ?

Function of stem :

- (i) It gives support to the plant.
- (ii) It conducts water and minerals from roots to leaves.
- (iii) It conducts food from leaves to other parts of the plant.

5. Which of the following leaves have reticulate venation ?

**Wheat, tulsi, maize, grass, coriander (dhania), china rose.**

Reticulate venation is found in the leaves of tulsi, coriander and china rose.

**6. If a plant has fibrous root, what type of venation are its leaves likely to have ?**

Parallel venation is found in the leaves of the plant which has fibrous root.

**7. If a plant has leaves with reticulate venation, what kind of roots will it have ?**

Tap roots will be found in the plant having leaves with reticulate venation.

**8. Is it possible for you to find out whether a plant has taproot or fibrous roots by looking at the impression of its leaf on a sheet of paper ?**

Yes, we can find out the type of root by looking at the impression of its leaf on a sheet of paper. Put paper on the leaf, hold the pencil tip sideways and rub it on the portion of paper having leaf below. We get impression of leaf with some lines on it. If the leaf has parallel venation, the fibrous roots are present in plant and if the leaf has reticulate venation, the tap roots are present in plant.



**9. Write the names of the parts of a flower.**

**The parts of a flower are as follows :**

(i) Sepals

(ii) Petals

(iii) Stigma

(iv) Anther

(v) Style

(vi) Androecium

(vii) Gynoecium

**10. Which of the following plants have you seen ? Of those that you have seen, which ones have flowers ?**

Grass, maize, wheat, chilli, tomato, tulsi, peepal, shisham, banyan, mango, jamun, guava, pomegranate, papaya, banana, lemon, sugarcane, potato, groundnut . Ans. Following plants have flowers : chilli, tomato, tulsi, mango, jamun, guava, pomegranate , papaya, banana, lemon

**11. Name the part of the plant which produces its food. Name this process.**

Leaves produce food and the process is called photosynthesis.

**12. In which part of a flower are you likely to find the ovary ?**

It is the lowermost and swollen part of the pistil.

**13. Name two flowers, each with joined and separated sepals.**

Flowers having joined sepals :Lotus, Tomato. Flowers having separated sepals : China rose, mustard.

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### I. Very Short Answer Type Questions

**1. What type of root system do gram and mustard have?**

Tap root.

**2. Name two plants that have reticulate venation.**

Grape, Bougainvillea.

**3. Name the process of releasing of water by plants.**

Transpiration.

**4. 'Kitchen of the plant' reminds you of which part of the plant?**

Leaf.

**5. Which gas is released by the plants during photosynthesis?**

Oxygen.

**6. A plant has leaves with parallel venation. What kind of root is it likely to have?**

Fibrous root.

**7. Solve the riddles given below.**

a. I have a green tender stem and I am much shorter than you. Who am I ?

b. I come out first from the seed when it is soaked in water. I provide anchorage to plants. Who am I? Write another function that I perform.

[NCERT Exemplar]

a. Herb

b. Root

Another function of root is to absorb water and minerals from the soil.

## II. Very Short Answer Type Questions

1. List few plants found around your house.

Mango, neem, grass, chilli, palak and banyan tree.

2. Are all the plants same in size?

No, all plants are of different sizes.

3. What are the major parts of plants?

Stem, root, leaves and flowers.

4. How many kinds of plants are there?

There are three kinds of plants:

(i) Herbs

(ii) Shrubs

(iii) Trees

5. Name two plants that belong to herbs.

(i) Tomato

(ii) Potato

6. Give two examples of shrubs.

(i) Lemon

(ii) Orange

7. Give two examples of trees.

(i) Mango

(ii) Neem

8. Define petiole.

The part (stalk) of a leaf by which it is attached to the stem is called petiole.

9. What is lamina?

The broad green flat part of leaf is called lamina.

10. What are veins?

The lines on the leaf are called veins.

11. What is midrib?

A thick vein in the middle of the leaf is called midrib.

12. What is leaf venation?

The design made by veins in a leaf is called leaf venation.

13. How many types of leaf venation are there?

There are two types of leaf venation:

(i) Reticulate venation

(ii) Parallel venation



(i)



(ii)

**14. What is transpiration?**

The process by which water comes out from the leaves in the form of vapour is called transpiration.

**15. Name the process by which leaves can prepare their food.**

This process is called photosynthesis.

**16. What are the raw materials for photosynthesis?**

- (i) Sunlight
- (ii) Water
- (iii) Carbon dioxide
- (iv) Chlorophyll

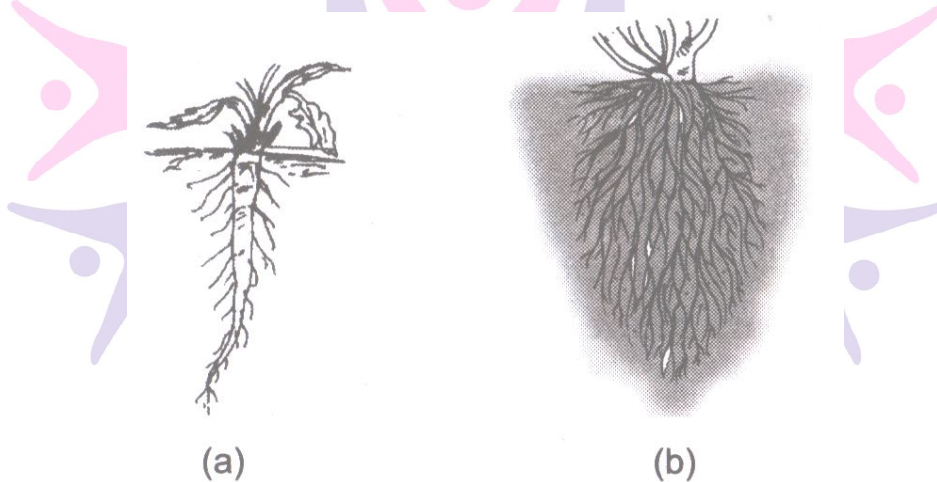
**17. Where does the photosynthesis take place in plants?**

It takes place in the leaves.

**18. Name the part of plant which helps in holding the plant in the soil.**

Roots.

**19. Name the types of roots shown in the Figure.**



(i) Tap roots

(ii) Fibrous roots

**20. What are tap roots?**

The roots in which one root is main root and other lateral roots grow on it are called tap roots.

**21. Give names of two plants which have tap root.**

Carrot and radish.

**22. Name two plants which have fibrous root.**

- (i) Wheat plant
- (ii) Maize plant

**23. What are lateral roots?**

The smaller roots that grow on the main tap root are called lateral roots.





**24. What are fibrous roots?**

The roots which do not have any main root but similar to bunch of roots similar are called fibrous root.

**25. Does the stem prepare food for any plant?**

Yes, there are some plants whose stem prepares food, e.g. cactus.

**26. Name the prominent parts of a flower.**

The prominent parts of a flower are petals, sepals, stamens and pistil.

**27. What are sepals? What are their functions?**

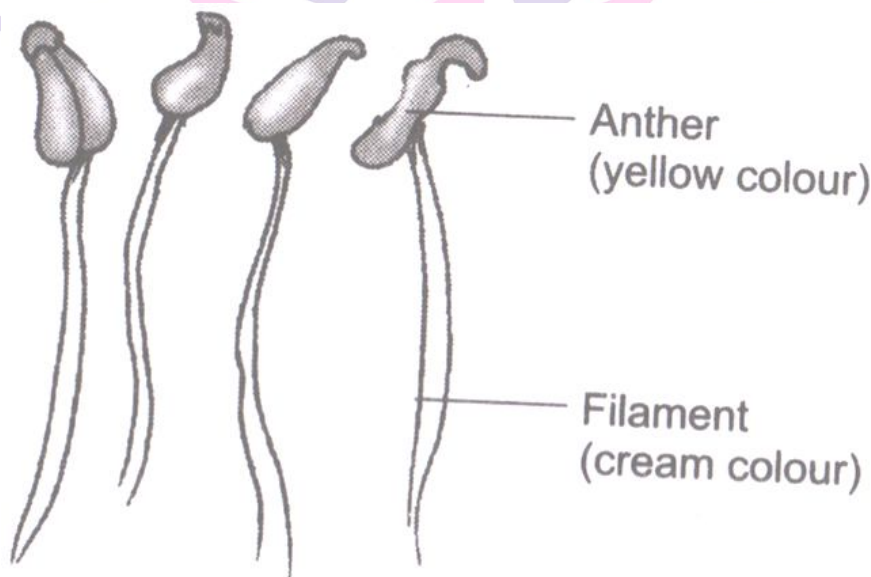
The small green coloured leaf-like structures are called sepals. It protects flower when it is in stage of bud.

**28. What are petals? Why are they generally coloured?**

The coloured big leaf-like structures present in flower are called petals. Petals are coloured so as to attract insects for pollination.

**29. What are stamens?**

When we remove sepals and petals from the flower then we see some filament, in the flower which are called stamens. These are the male part of the flower.



**30. Name various parts of stamen.**

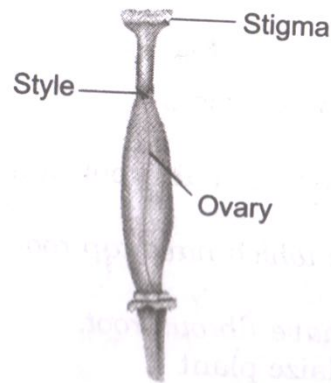
There are two parts of a stamen:

- (i) Anther
- (ii) Filament.

These are the male part of the flowers.

### 31. What is pistil?

The innermost part of a flower is called pistil. It is the female part of the flower.



### 32. Name the various parts of pistil.

There are three parts of pistil:

- (i) Stigma                      (ii) Style                      (iii) Ovary

### 33. What are ovules?

These are small bead-like structures inside the ovary.

### 34. What are the functions of roots?

- (i) Roots absorb water and minerals from soil.  
(ii) Roots store food.  
(iii) Roots provide support.  
(iv) Roots prevent soil erosion.

### 35. Give examples of edible roots.

Carrot, turnip, beetroot and sugar-beet.

### 36. Name a plant that eats insect.

Pitcher plant.

### 37. Pitcher plant has green leaves which can prepare food by photosynthesis then why does it eat insects?

To get nitrogenous compounds which it cannot absorb from the soil.

### 38. Name a plant that has underground as well as aerial (above the ground) root system.

Banyan tree.

### 39. Why do we see dew drops on leaves in the early morning?

At night the water lost by leaves does not get evaporated and gets collected on the leaves in the form of dew drops.

### 40. Why are petals colourful?

The colourful petals attract insects for pollination.

**41. Why does white flowers bloom at night?**

White colour attracts night insects for pollination.

**42. What do you mean by a complete and incomplete flower?**

The flower with all whorls, i.e., sepals, petals, stamen and carpel in it is a complete flower. If any one of this is absent in a flower it is called an incomplete flower.

**43. Leaves need oxygen and carbon-dioxide (for respiration and photosynthesis respectively). How do they get these gases?**

Leaves take in these gases from atmosphere through small pores present on them called stomata.

**44. How can one destarch the leaves of potted plant without plucking them?**

By keeping it in dark for 2-3 days.

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**I. Short Answer Type Questions.**

**1. What are weeds?**

The unwanted plants that grow in the field with the main crops or in their surroundings are called weeds. Weeds are the plants which are not grown by the farmers. For example, grass.

**2. Classify plants and given an example of each.**

On the basis of various characteristics most of the plants can be classified into three categories.

- i. Herbs, eg. Tomato
- ii. Shrubs, eg. Lemon
- iii. Tree, eg. Mango

**3. What are herbs? Give two examples.**

The plants with green and tender stems are called herbs. They are usually short and may have no or less branches. For examples, tomato, potato.

**4. What are shrubs? Give two examples.**

The plants which have a hard but not a very thick stem are called shrubs. Such plants have the stem branching out near the base. For example, lemon, rose plants.

**5. What are trees? Give two examples.**

The plants which are very tall and have hard and thick brown stem are called trees. The stems have branches in upper part and much above the ground. For example, mango, neem.

**6. What are creepers? Write an example.**

The plants with weak stem that cannot stand upright and spread on the ground are called creepers. Various types of grasses are the examples of creepers.

**7. What are climbers?**

The plants that take support of neighbouring structures and climb up are called climbers. They have weak stem. For example, grapes, money plant, beans.

**8. Explain an activity to show that stem conducts water and other substances.**

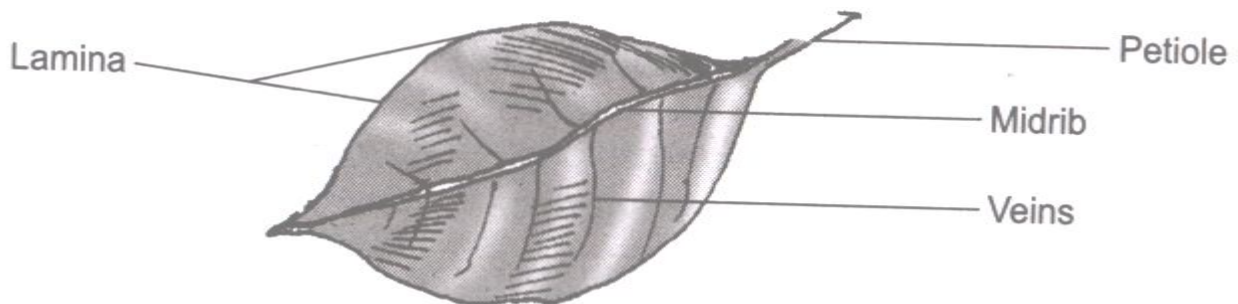


Take some water in a glass. Add few drops of red ink to the water. Cut the stem of a herb plant from its base. Put it in the glass as shown in figure. We will see that some parts of the stem become red. This activity shows that stem conducts water.

**9. Explain the structure of a leaf with the help of a labelled diagram.**

There are two main parts of leaf:

- (i) Petiole: The part of the leaf by which it is attached to the stem is called petiole.
- (ii) Lamina: The broad, green part of the leaf is called lamina.



**The lamina contains following parts:**

- (i) Veins: There are various types of lines on the leaf. These lines are called veins.
- (ii) Midrib: There is a thick vein in the middle of the leaf. This vein is called midrib.

## 10. Explain the main functions of leaf

There are following two main functions of leaf:

(i) Transpiration: The extra water comes out of the leaves in the form of vapour. This process is called transpiration.

(ii) Photosynthesis: The process by which leaves prepare their food from water and carbon dioxide, in the presence of sunlight and a green-coloured substance, is called photosynthesis.

## 11. What are unisexual and bisexual flowers?

Unisexual flower has either male (stamen) or female (pistil) parts. Bisexual flowers have both male and female whorl in the flowers, i.e., they have both stamen and pistil.

## 12. What is the relation between leaf venation and the type of roots?

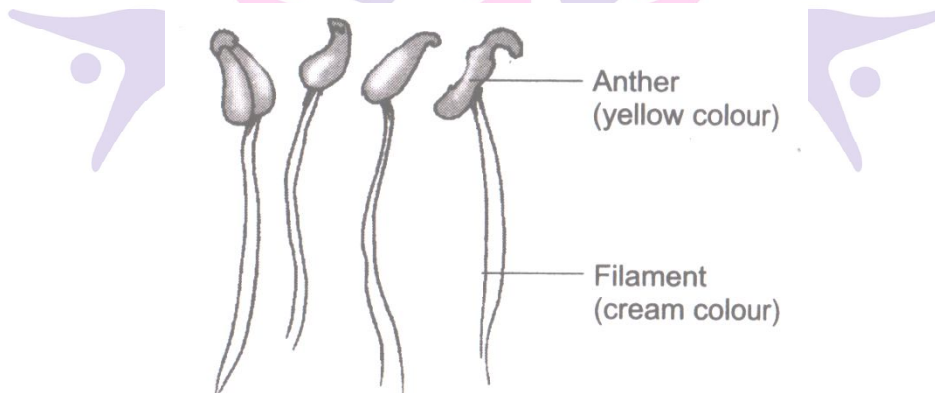
The plants having tap root have reticulate venation. The plants having fibrous roots have parallel venation.

## 13. Name the male part of a flower. Write names of its parts and draw a diagram.

Ans. The male part of a flower is called stamen. It has two parts:

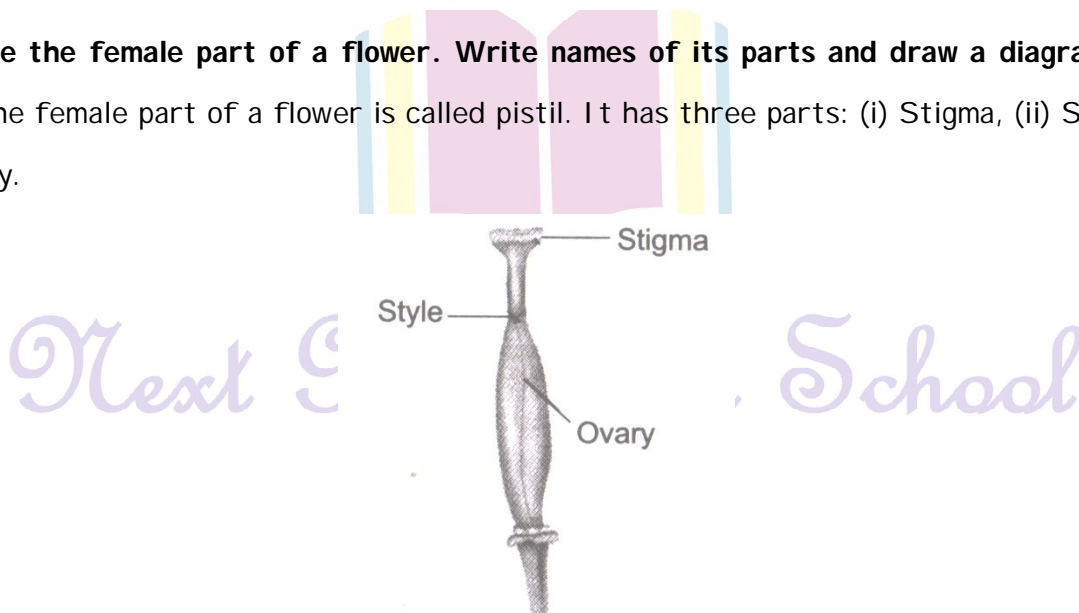
(i) Filament and

(ii) Anther.



## 14. Name the female part of a flower. Write names of its parts and draw a diagram.

The female part of a flower is called pistil. It has three parts: (i) Stigma, (ii) Style and (iii) Ovary.



**15. Differentiate between tap root and fibrous root.**

<b>Tap root</b>	<b>Fibrous root</b>
1. Tap root has only one main and long root. The smaller roots that grow from the main root are called lateral roots.	1. Fibrous roots do not have a main root. All roots seem similar.
2. Tap root goes deep into the soil.	2. They do not go deep into the soil.
3. Tap roots are found in plants which have reticulate venation in their leaves.	3. These are found in plants which have parallel venation in their leaves.

**II. Short Answer Type Questions.**

**1. Name two flowers, each with joined and separate sepals.**

- i. Flowers with joined sepals: Periwinkle and Hibiscus.
- ii. Flowers with separated sepals: Rose and Magnolia.

**2. How are plants classified on the basis of their**

- i. Life span?**
  - i. Perennial Biennials and annual.
  - ii. Tree, shrub, herb, climber and creeper.
- ii. Form?**

**III. Short Answer Type Questions.**

**1. Is there any relationship between the type of root system and the type of venation ?**

A plant with tap root system has reticulate venation while a plant with fibrous roots has parallel venation.

**2. Is sweet potato a stem, root or a fruit ? Justify your answer.**

Sweet potato is a modified root, meant for the storage of food material.

**3. What is venation ? What are the types of venation ?**

Arrangement of veins on the lamina of leaf is called venation. They are of two types :

- (a) Reticulate venation
- (b) Parallel venation.

**4. Differentiate between shrubs & herbs.**

Herbs are comparatively smaller plants, have green stem whereas shrubs have distinct and harder stem with branching from near the ground.

**5. Mention two functions of a stem.**

(i) The stem carries water and minerals from the roots to the different parts of the plant.

(ii) The stem provides support to the branches, leaves, flowers and fruits.

**6. What are the parts of a flower ?**

The basic parts of a flower are sepals, petals, stamens and pistil.

**7. How are plants classified ?**

Plants are classified into herbs, shrubs, trees, climbers and creepers on the basis of their height, type of stem and the mode of branching.

**8. On the basis of height, name the three types of plants.**

Three types of plants are : 1. Herbs 2. Shrubs 3. Trees

**9. What is the difference between petiole and lamina ?**

These are two parts of leaf :

Petiole is the part of the leaf or small stalk by which the leaf is attached to the stem.

Lamina is the flat, thin and broad part with conspicuous system of veins and vein lets.

**10. Shikha has placed rose under shrubs. Is she correct ? Justify**

Yes, she is correct. Rose is categorised as a shrub because it displays the following characteristics :

(i) These are medium-sized plants with least thickness and height.

(ii) It has woody stem.

(iii) These are generally bushy.

(iv) Branches are slightly above the ground.

(v) Roses are generally used for ornamental purposes.

**11. Match the parts of plant given in Column I with their functions in Column II .**

Column I	Column II
(a) Flower	(i) Excretion
(b) Leaf	(ii) Photosynthesis
(c) Stem	(iii) Reproduction
(d) Root	(iv) Bears branches
	(v) Anchorage

a. iii	b. ii	c. iv	d. v
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12. Boojho wanted to test the presence of starch in leaves. He performed the following steps :

(1) He took a leaf and boiled it in water.

(2) He placed the leaf in a petri dish and poured some iodine over it. He did not get the expected result. Which step did he miss ? Explain. [NCERT Exemplar]

He did not boil the leaf in spirit to remove the green pigment, chlorophyll. For testing of starch, it is necessary to remove the chlorophyll before performing the experiment.

13. Give the basis of characterising different types of plants using any one of the salient features.

Plants are characterised into three types on the basis of several features. One of the features is

"Type of stem" :

**Trees** : They are tall, have hard, thick and woody stems.

**Shrubs** : They are of medium height, have hard and woody stems.

**Herbs** : They are short and have tender, green and short stems.

14. Differentiate between creepers and climbers.

Creepers	Climbers
(1) Stem is thin, delicate, weak and unable to stand erect.	(1) Stem is long, flexible and goes up entwined around the support.
(2) May grow prostrate on ground or may get buried in the topsoil. Examples : Pumpkin, grass, etc.	(2) Take support of the nearby objects to climb. Example : Pea.

15. Write three functions of roots. Roots perform following functions in the plant :

- (a) Roots absorb water and minerals from the soil.
- (b) Roots hold the plant to the soil.
- (c) Roots store food .

16. Will a leaf taken from a potted plant kept in a dark room for a few days turn blue black when tested for starch ? Give reasons for your answer. [NCERT Exemplar]

No, it will not turn blue-black because the stored starch would have been used up by the plant when kept in a dark room for a few days. Starch would not be synthesized due to absence of sunlight.



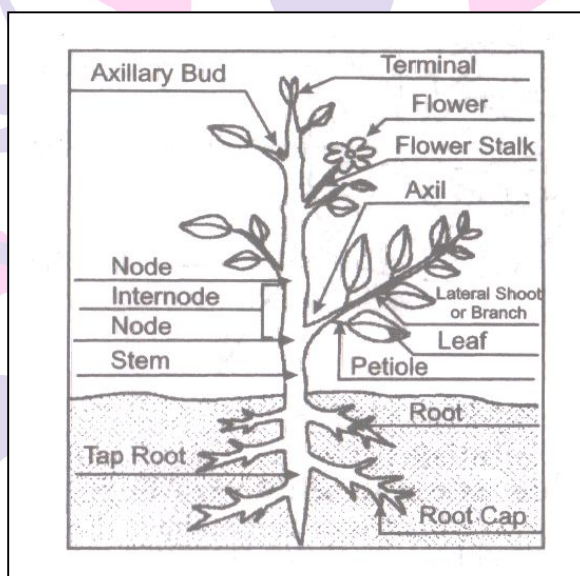
17. Can the stem of a plant be compared with a street with two-way traffic ? Give reason. [NCERT Exemplar]

Yes, the stem of a plant can be compared with a street with two-way traffic because of the following reasons :

- (i) It carries water and minerals from the roots to other parts in upward direction.
- (ii) It carries food from the leaves to other parts of the plant.

### I. Long Answer Type Questions.

1. Draw a labelled diagram of a plant.



2. Describe a leaf.

A leaf is a thin expanded outgrowth arising from the node of a stem. The part of a leaf by which it is attached to the stem is called a petiole. The broad green part of the leaf is called lamina. The lines on the leaf are called veins. The thick vein in the middle of the leaf is called the midrib. The design made by the veins on the leaf is called venation. If the design is net like, it is termed as reticulate venation whereas if the veins are parallel to each other, it is termed as parallel venation.

3. What are the characteristics of plants ?

Characteristics of plants are :

- (i) They cannot move from one place to another.
- (ii) They can prepare their own food.
- (iii) These are the living organisms on the earth which are responsible for the formation of food for all the living forms directly or indirectly.

(iv) All other organisms on the earth depend on the plants and their products for their survival.

(v) Plants grow in the soil from where they take nutrients for their growth and propagation.

**4. Read the functions of parts of a plant given below :**

- (a) Fixes plant to the soil
- (b) Prepares starch
- (c) Takes part in reproduction
- (d) Supports branches and bears flowers

In the diagram given in Fig., write the names of the parts whose functions you have just read at the appropriate space.

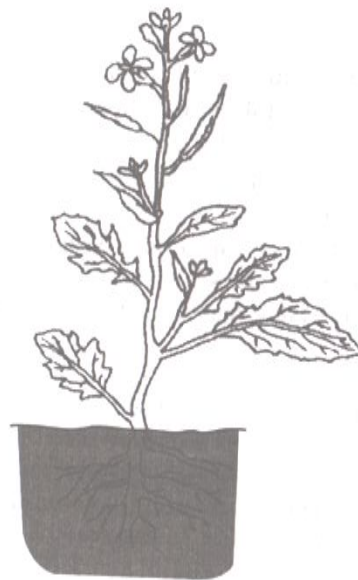
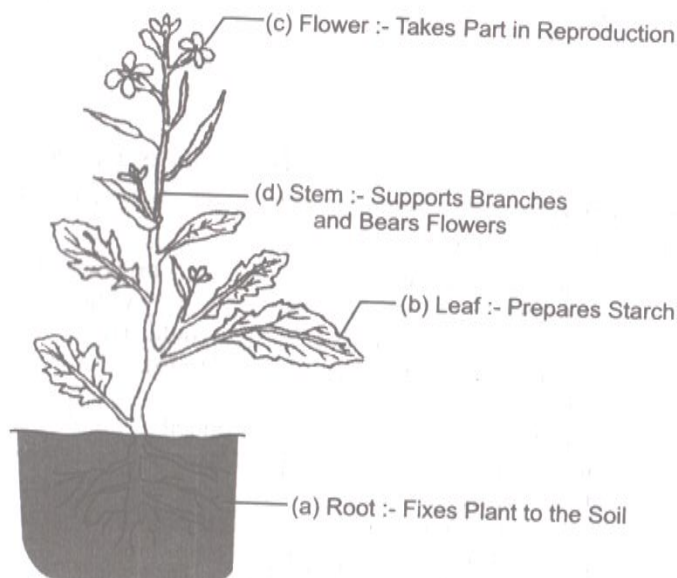


Fig.

[NCERT Exemplar]

Ans.



5. Draw the veins of leaves given in and write the type of venation.

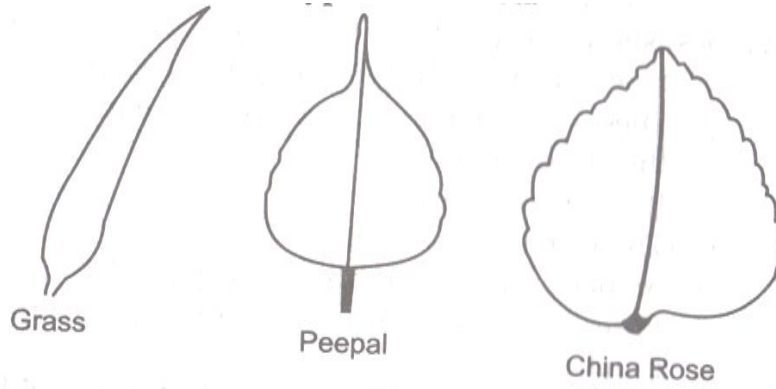


Fig.

[NCERT Exemplar]

Ans.

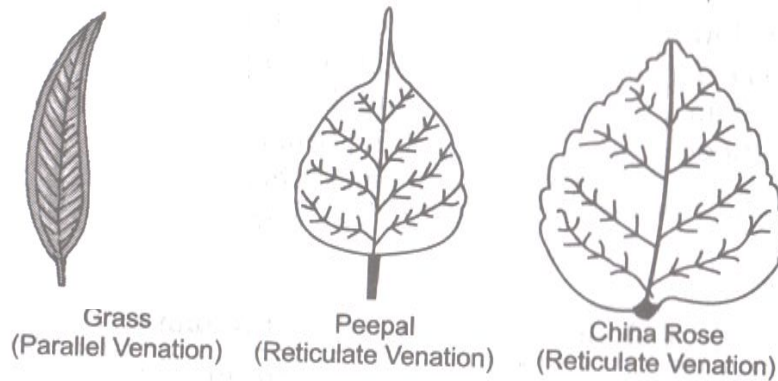


Fig.

6. Observe Fig. and attempt the questions that follow.

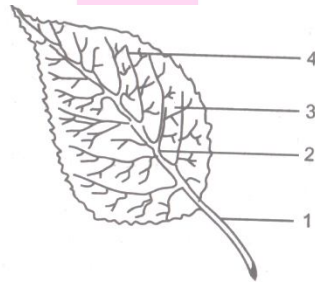


Fig.

- (a) Label the parts 1, 2, 3 and 4 in the diagram.
- (b) What type of venation does the leaf have ?
- (c) What type of venation is seen in grass leaves ?

[NCERT Exemplar]

Ans. (a)

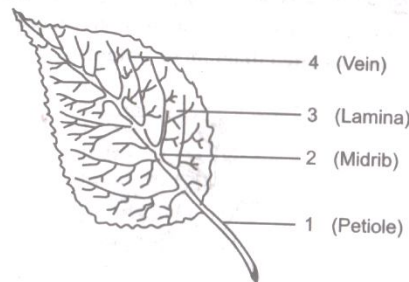
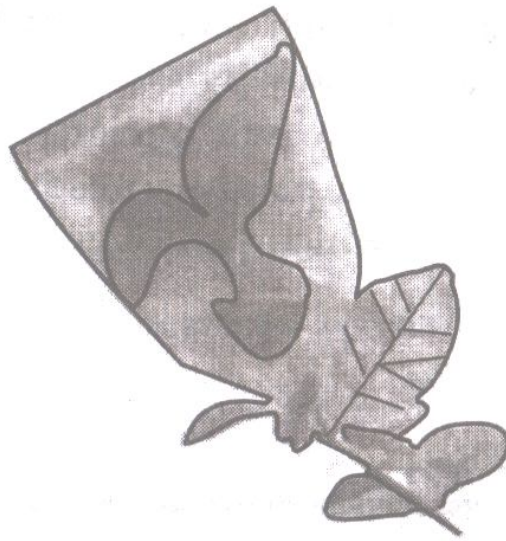


Fig.

- (b) The leaf has reticulate venation.
- (c) The grass leaves have parallel venation.

7. Observe the picture of an activity given as Fig. carried out with leaves of plants and polythene bag.



Now answer the following :

- Which process is demonstrated in the activity?
- When will this activity show better results - on a bright sunny day or a cloudy day?
- What will you observe in the polythene bag after a few hours of setting up the activity?
- Mention any one precaution you must take while performing this activity.

[NCERT Exemplar]

**Answer**

- Transpiration.
- This activity will show better result on a bright sunny day because transpiration is maximum in sunlight.
- Small droplets of water will be seen in the polythene bag after a few hours.
- Polythene bag should be clean and its mouth should be sealed properly.

8. Identify the wrong statements and correct them.

- Anther is a part of the pistil
- The visible parts of a bud are the petals.
- Leaves perform the function of transpiration only.

[NCERT Exemplar]

**Answer:**

- Anther is a part of the pistil.

Correct Statement : Anther is a part of the stamen.

b. The visible parts of a bud are the petals.

Correct Statement : The visible parts of a bud are the sepals.

c. Leaves perform the function of transpiration only.

Correct statement : Leaves perform the functions of both photosynthesis and transpiration.

**9. Fill in the blanks with the terms that are listed below.**

**anther, male, ovary, ovules, petals, pistil, stamen, filament.**

Sepals,  a , stamen and  b  are the parts of a flower. Stamen is made up of  c  and  d  and it represents the  e  part of the flower. The female part of the flower is called the  f . The basal, swollen part of the pistil is called the  g  which contain the  h .

a. Petals

b. Pistil

c. Filament

d. Anther

e. Male

f. Pistil

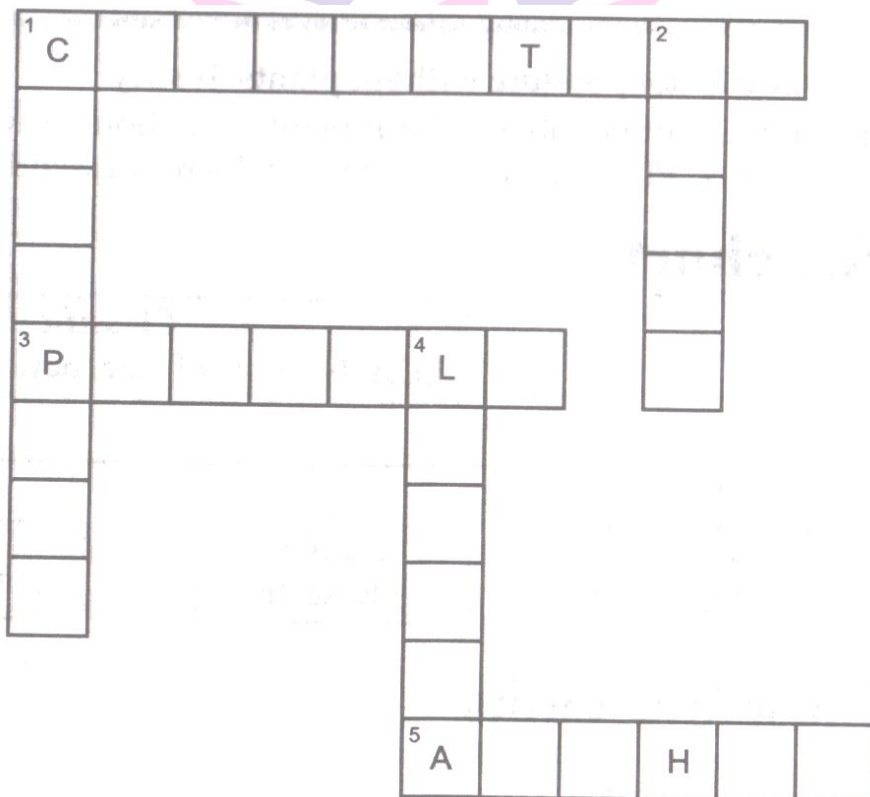
g. Male

f. Pistil

g. Ovary

h. Ovules

**10. Solve the crossword given in Fig. as per the clues given below it :**



**Across**

1. The term that describes upward movement of water in a stem.

3. The part of leaf which is attached to the stem.

5. This part is attached to the tip of filament.

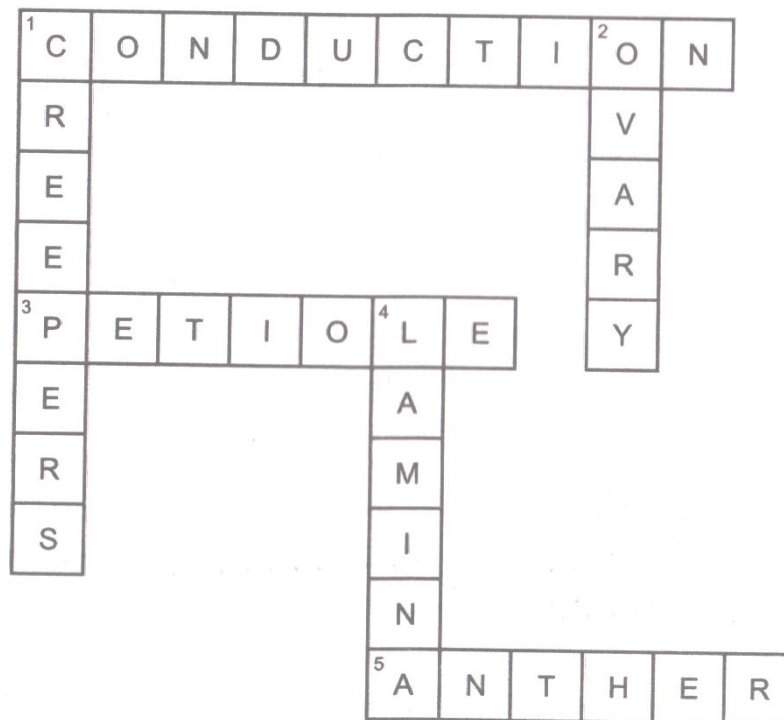
### Down

1. Plants that are weak and spread on the ground.
2. Ovules are present in this part of flower.
4. Is the broad part of leaf.

[NCERT Exemplar]

### Answer:

The solved puzzle as per the clues given is given below.



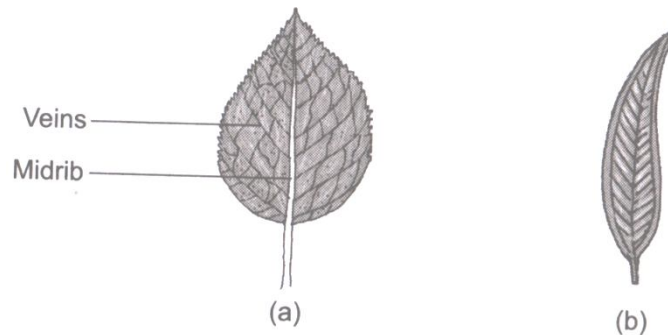
## II. Long Answer Type Questions.

1. What do you mean by leaf venation? Explain various types of leaf venation with example.

**Leaf venation:** The design made by veins in a leaf is called leaf venation. There are the following two types of a leaf venation.

(i) Reticulate venation: If the design of veins makes a net-like structure on both the sides of midrib then it is called reticulate venation. For example, mango leaf, gram leaf.

(ii) Parallel venation: If the veins are parallel to each other or to midrib then such type of venation is called parallel venation. For example, wheat leaf, barley leaf.



**2. Explain the structure of a typical flower with the help of a diagram.**

A typical flower contains the following parts:

(i) Stalk: The part by which a flower is attached to the branch is called stalk.

(ii) Sepals: The small green leaf-like structures of the flower are called sepals.

(iii) Petals: The big coloured leaf-like structures are called petals. Different flowers have petals of different colours.

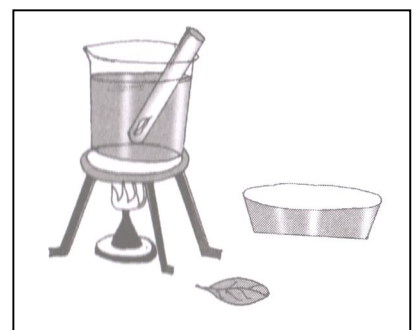
(iv) Stamen: It is the male part of the flower. It has two parts: (a) Filament and (b) Anther.



(v) Pistil: The innermost part of a flower is called pistil. It has three parts: (a) Stigma, (b) Style and (c) Ovary. It is the female part of the flower.

**3. Explain an activity to test the presence of starch in a leaf.**

Take a leaf in a test tube and pour spirit till it completely covers the leaf. Now put the test tube in a beaker having water. Heat the beaker till all the green colour from the leaf comes out into the spirit in the test tube. Take out the leaf and wash it with water. Put it on a plate and pour some iodine solution over it. The iodine solution is brown



in colour but when it comes in contact with starch it turns blue-black. The iodine solution will turn blue-black when dropped on the leaf, this confirms the presence of starch in the leaf.

#### 4. Explain that sunlight is essential for photosynthesis.

Take a potted plant having green leaves. Place it in a dark room for one day or two days so that all the starch present in leaves is used by the plant. Now cover a portion of leaf with black paper and keep the plant in the sun for a day. Pluck the leaf, remove the black paper and test it for the starch. We see that only that part of the leaf becomes blue-black which was open to sun. The covered part does not become blue-black. This shows that no starch is formed because it gets no sunlight.

#### 5. Explain the important functions of root.

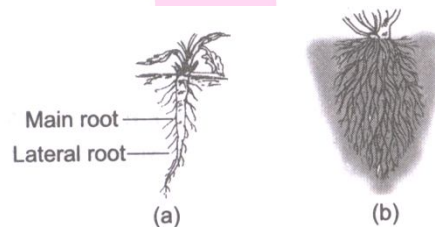
The following are the functions of root:

- (i) They help to absorb water from the soil.
- (ii) The roots help in holding the plants firmly in the soil.
- (iii) They are said to anchor the plant to the soil.

#### 6. Explain various kinds of roots with the help of an example.

There are following two types of roots:

- (i) Tap roots: The roots which have one main root and other smaller lateral roots are called tap roots. For example, mustard plant, gram.
- (ii) Fibrous roots: The roots which have no main root but all the roots appear similar are called fibrous roots. For example, maize, wheat.



#### 7. Identify the following plants as herbs, shrubs and trees.

- |                      |                      |                       |
|----------------------|----------------------|-----------------------|
| (i) tomato           | (ii) rice            | (iii) eucalyptus      |
| (iv) blueberry       | (v) China rose       | (vi) lavender         |
| (vii) mango          |                      |                       |
| (i) tomato-herb      | (ii) rice-herb       | (iii) eucalyptus-tree |
| (iv) blueberry-shrub | (v) China rose-shrub | (vi) lavender-herb    |
| (vii) mango-tree     |                      |                       |



**8. Complete the following table:**

S.No.	Name of plant	Type of leaf venation	Type of roots
1.	Mango	_____	_____
2.	Mustard	_____	_____
3.	Wheat	_____	_____
4.	Bajara	_____	_____
5.	Gram	_____	_____

S.No.	Name of plant	Type of leaf venation	Type of roots
1.	Mango	Reticulate	Tap root
2.	Mustard	Reticulate	Tap root
3.	Wheat	Parallel	Fibrous root
4.	Bajara	Parallel	Fibrous root
5.	Gram	Reticulate	Tap root

**High Order Thinking Skills (HOTS) Questions**

**1. Is a mango sapling a herb? Give reason to support your answer.**

No, it is not a herb because sapling is a stage in the growth of the plant. A mango sapling would grow into a tree.

**2. Rohit tries to pull out a grass and a rose plant from the soil. Which one will he be able to pull out more easily and why?**

He will be able to pull out grass more easily as compared to rose plant because fibrous roots are found in grass which do not go down much deep in soil.

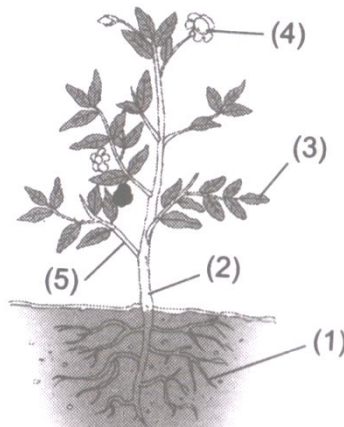
**Value Based Question**

**1. Life is not possible without plants. Justify.**

Life is not possible without plants. We should save plants. Plants give us oxygen which is essential for life. They provide us raw materials for various purposes. They are the house of many birds and animals.

## Skill Based Questions

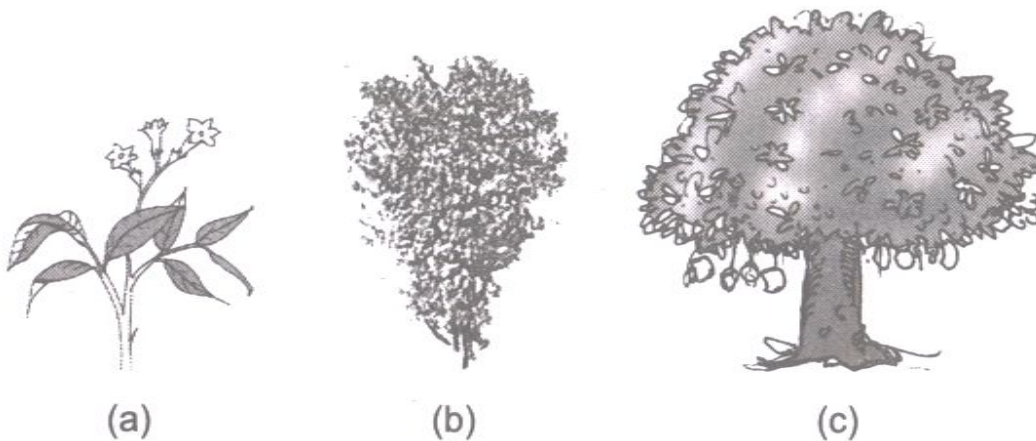
1. Observe the following figure and name the part of plant indicated by 1, 2, 3, 4 and 5.



**Answer:**

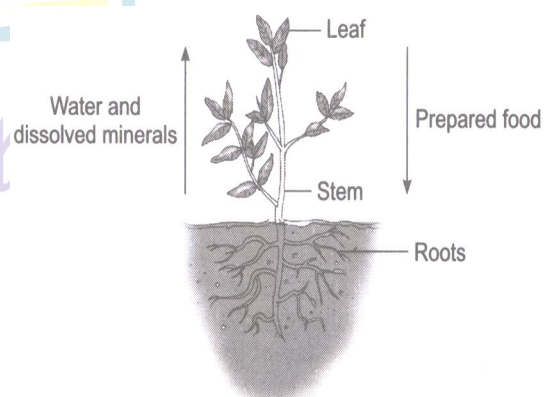
- |           |           |         |
|-----------|-----------|---------|
| 1. Root   | 2. Stem   | 3. Leaf |
| 4. Flower | 5. Branch |         |

2. Draw a diagram to show (a) herb, (b) Shrub and (c) tree.

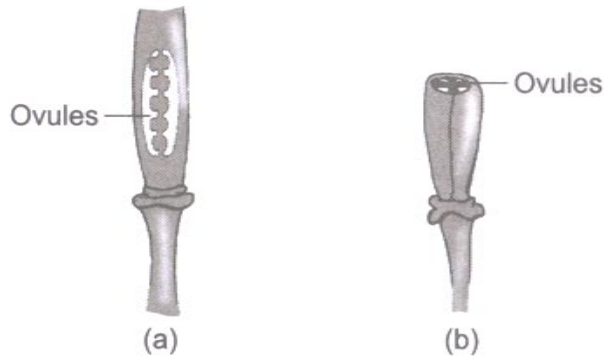


3. Draw diagram of a plant. Explain how the stem acts as a two way street. Mark arrows, if necessary.

Roots absorb water and minerals from the soil. Stem conducts these to leaves and other parts of the plant in upward direction. On the other hand, the stem conducts food prepared by leaves to roots, storage parts and other plant parts, usually in downward direction. It transports materials in both the directions, so it acts as a two way street.

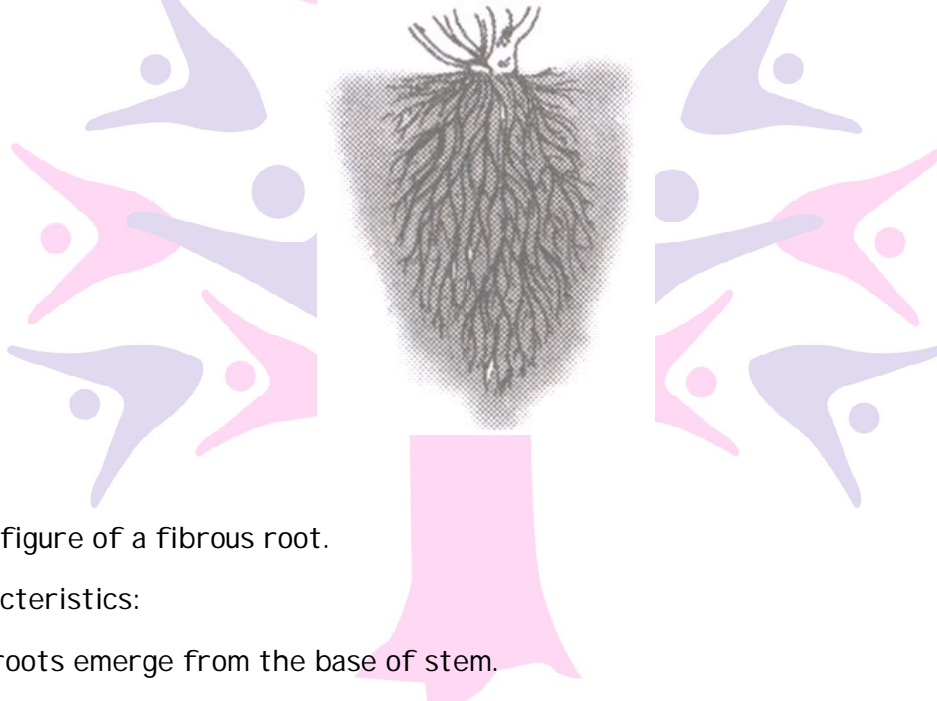


4. Draw a diagram to show longitudinal and transverse cut of an ovary.



Inner structure of an ovary—(a) Longitudinal cut and (b) Transverse cut

5. Identify the following figure and write two characteristics of it.

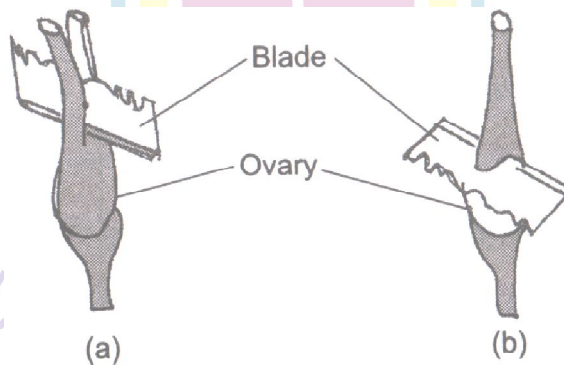


It is figure of a fibrous root.

Characteristics:

- i. All roots emerge from the base of stem.
- ii. These root do not go deep in the soil.

6. Observe the diagram (a) and (b) and suggest title / caption to each diagram.



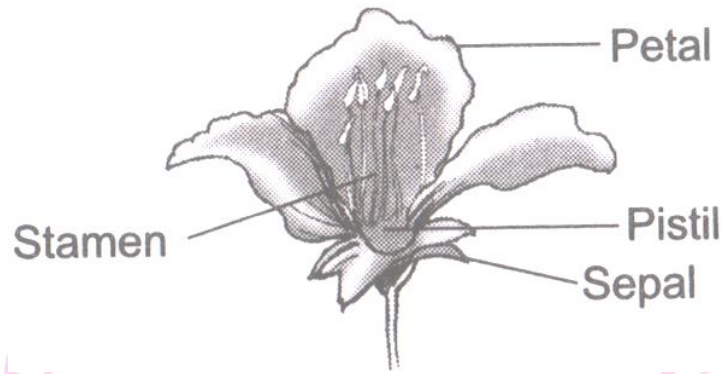
Next

School

Answer:

- a. Longitudinal cut of the plant ovary.
- b. Transverse cut of the plant ovary.

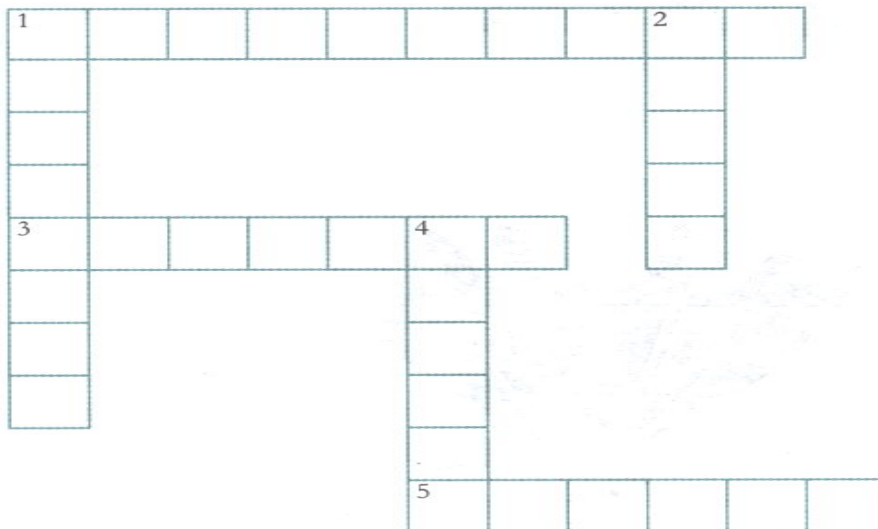
7. Draw a picture to show the various parts of a flower.



### Crossword Puzzles

1. Solve the crossword as per the clues given below it.

[NCERT Exemplar]



#### Across

1. The term that describes upward movement of water in a stem.
3. The part of leaf which is attached to the stem.
5. This part is attached to the tip of filament.

#### Down

1. Plants that are weak and spread on the ground.
2. Ovules are present in this part of flower.
4. Is the broad part of leaf.

**Answer:**

**Across**

1. Conduction
3. Petiole
5. Anther

**Down**

1. Creepers
2. Ovary
4. Lamina

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