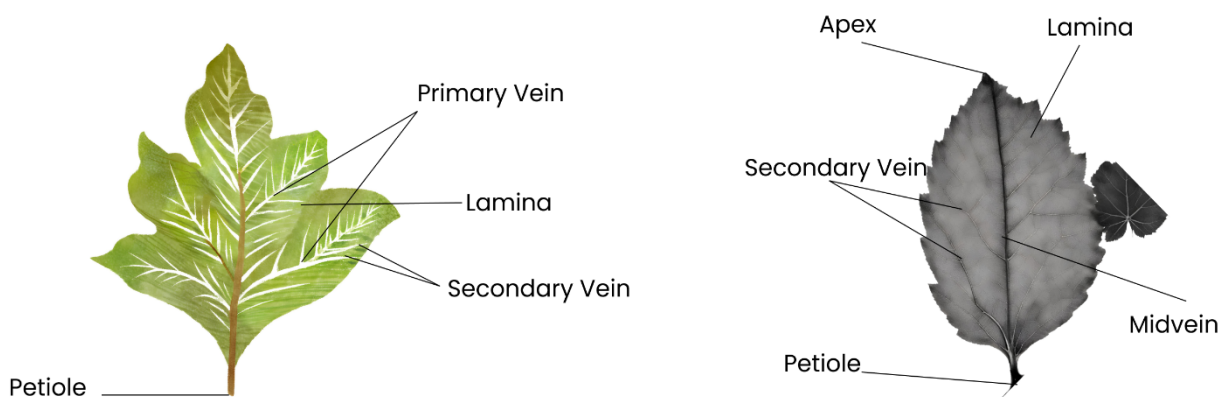


NCERT Solutions for Class 11 Biology
Chapter 5 – Morphology of Flowering Plants

1. How is a pinnately compound leaf different from a palmately compound leaf?

Ans:

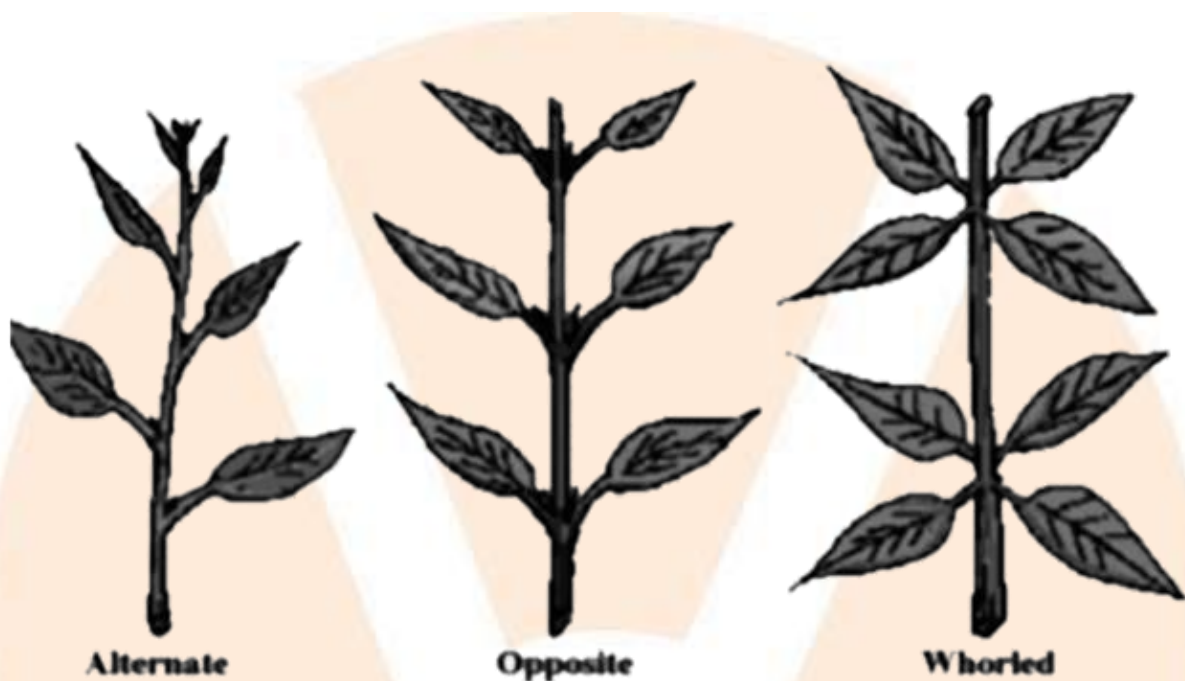
Pinnately Compound Leaf	Palmately Compound Leaf
Leaflets form a compound leaf when they are attached to a common axis called the rachis.	A common point on the leaf stalk connects the leaflets.
Neem and Cassia fistula (also known as golden shower plant) are examples.	Silk cotton -Bombax and cannabis are examples.



2. Explain with suitable examples the different types of phyllotaxy?

Ans:

The arrangement or pattern of leaves on a stem or branch is called Phyllotaxy. Phyllotaxy is categorized as alternate, opposite, and whorled. A single leaf emerges from the node of an alternate phyllotaxy plant. Plants such as sunflowers, mustard, and peepal exhibit phyllotaxy. Phyllotaxy, or opposite leaf growth, occurs when two leaves emerge oppositely from the node. In plants like guavas and jamuns, it is found. The leaves of whorled plants arise from a node that has three or more leaves. It can be found in Alstonia.



Phyllotaxy in Leaves

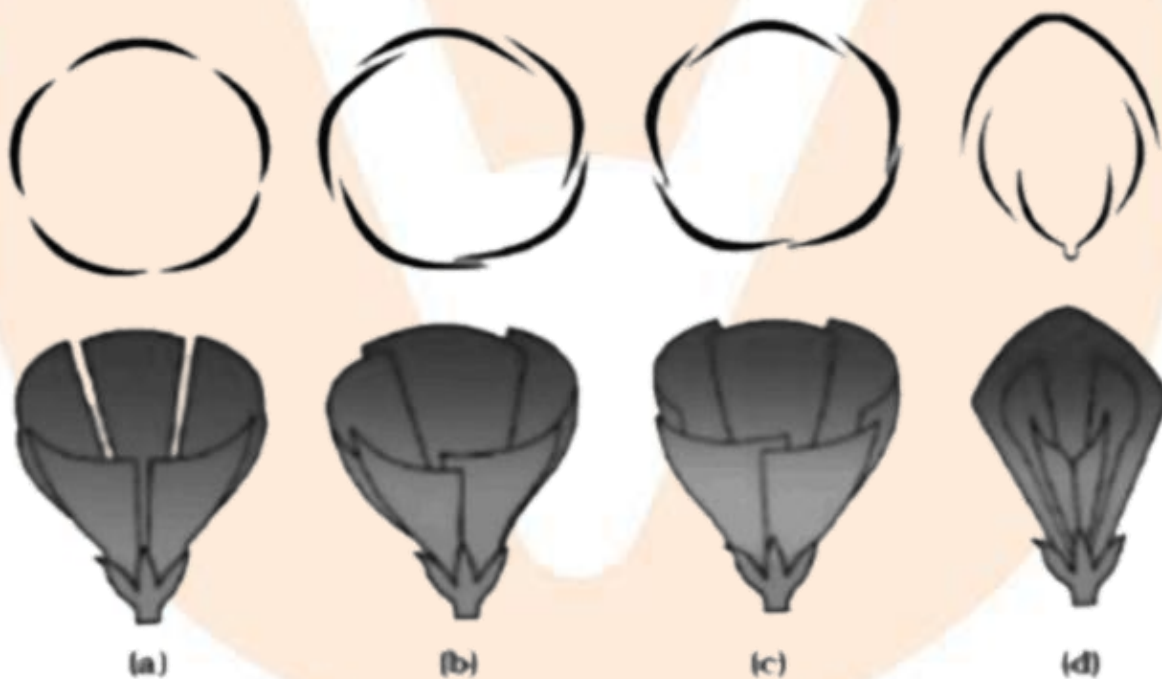
3. Define the following terms

- a. Aestivation
- b. Placentation
- c. Actinomorphic
- d. Zygomorphic
- e. Superior ovary
- f. Perigynous flower

g. **Epipetalous Stamen**

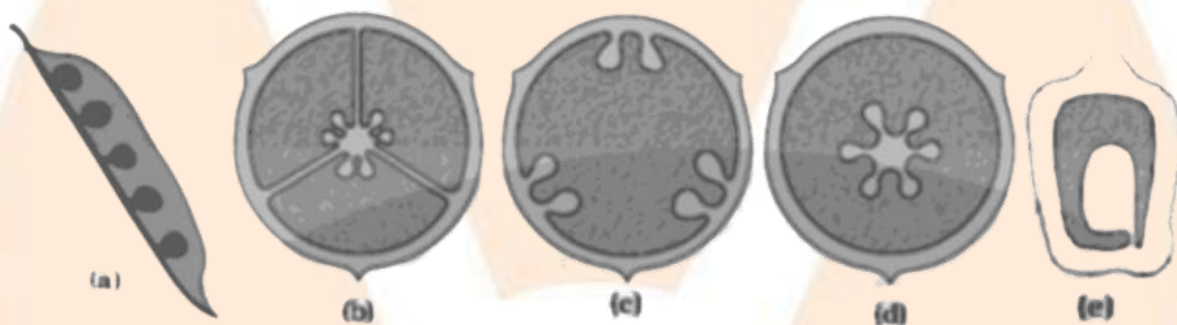
Ans:

- a. **Aestivation:** Aestivation describes the arrangement of sepals or petals within a flower bud relative to other members. In plants, aestivation consists of four types: valvate, twisted imbricate, and vexillary.



Types of Aestivation in Corolla

- b. Placentation:** The placentation of ovules in an ovary has been commonly termed placentation. There are five basic types of interdigital structures: marginal, basal, parietal, axile, and free central.



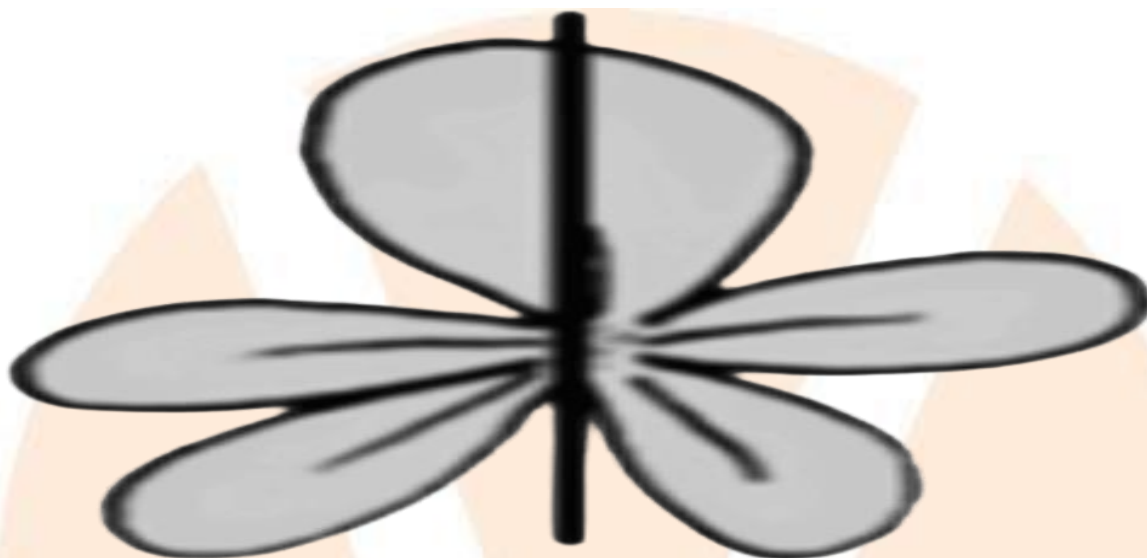
Placentation (a) marginal (b) axile (c) parietal (d) free central (e) basal

- c. Actinomorphic:** A radial plane passing through the center of a filamentous flower can divide it in two. Chilli and mustard are examples of these flowers.



Actinomorphic Flower

- d. Zoomorphic:** These flowers share a common vertical axis that divides them into two similar halves. In other words zygomorphic flowers have bilateral symmetry. Peas and beans are examples.



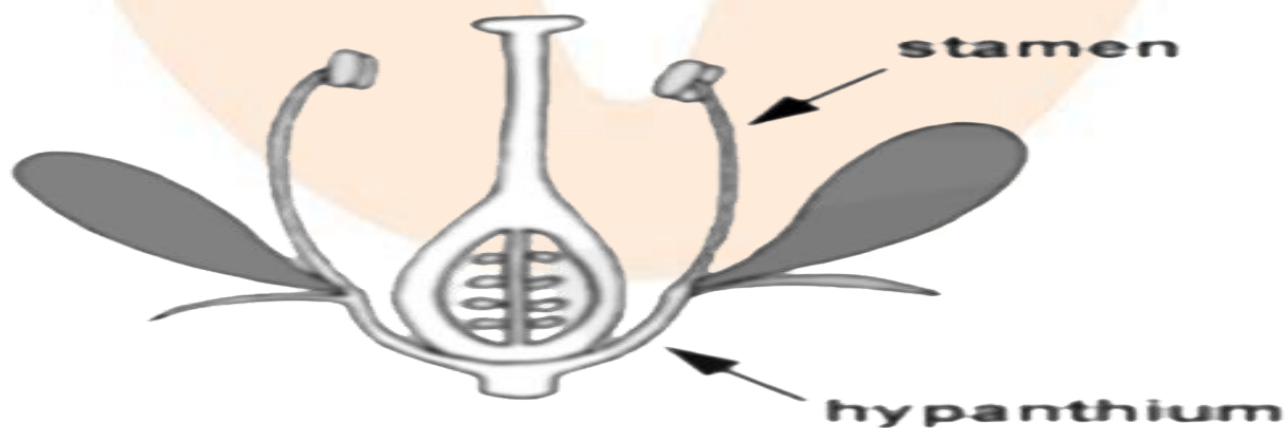
Zygomorphic Flower

- e. **Superior ovary:** Those flowers with the gynoecium at the top and other floral parts below are referred to as superior ovary flowers. It is called hypogynous when it has this arrangement. Brindle and mustard are two examples.



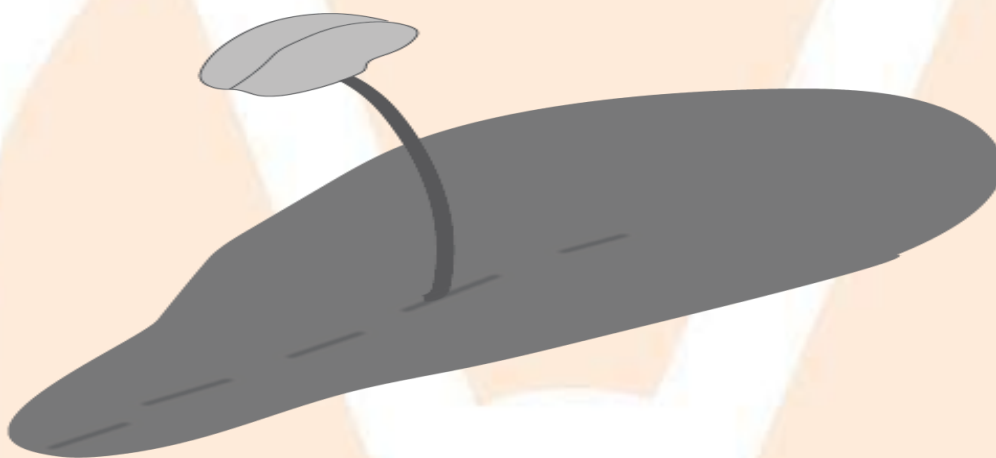
Superior Ovary

- f. **Perigynous flower:** The thalamus of perigynous flowers forms a cup-shaped structure, and floral parts grow from the cup's rim. A condition where the ovary is half superior, half inferior, is described as this. Plums and roses are examples of this.



Perigynous Flower

- g. **Epipetalous Stamen:** Stamen with petals attached to them. Brinjal is a good source of them.



Epipetalous Flower

4. Differentiate between

- (i) Racemose and cymose inflorescence
- (ii) Apocarpous and syncarpous ovary

Ans:

- (i)

Feature	Racemose inflorescence	Cymose inflorescence
Flower Arrangement	Acropetal	Basipetal
Flower Development	Sequentially from base to tip	From buds below the terminal flower
Main Axis Growth	Continuous	Terminates in a flower
Examples	Lilies, hyacinth	Dandelions

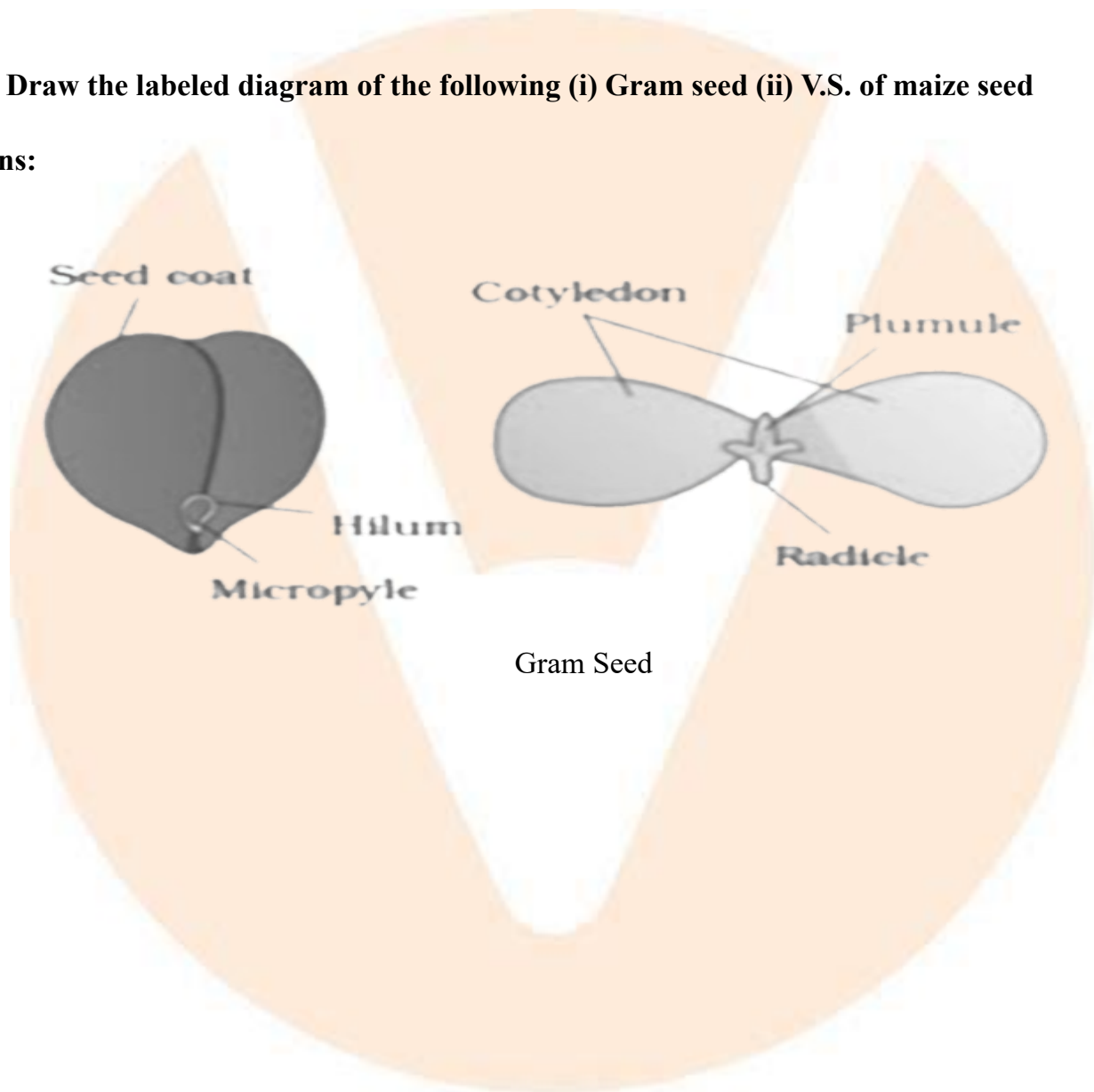
(ii)

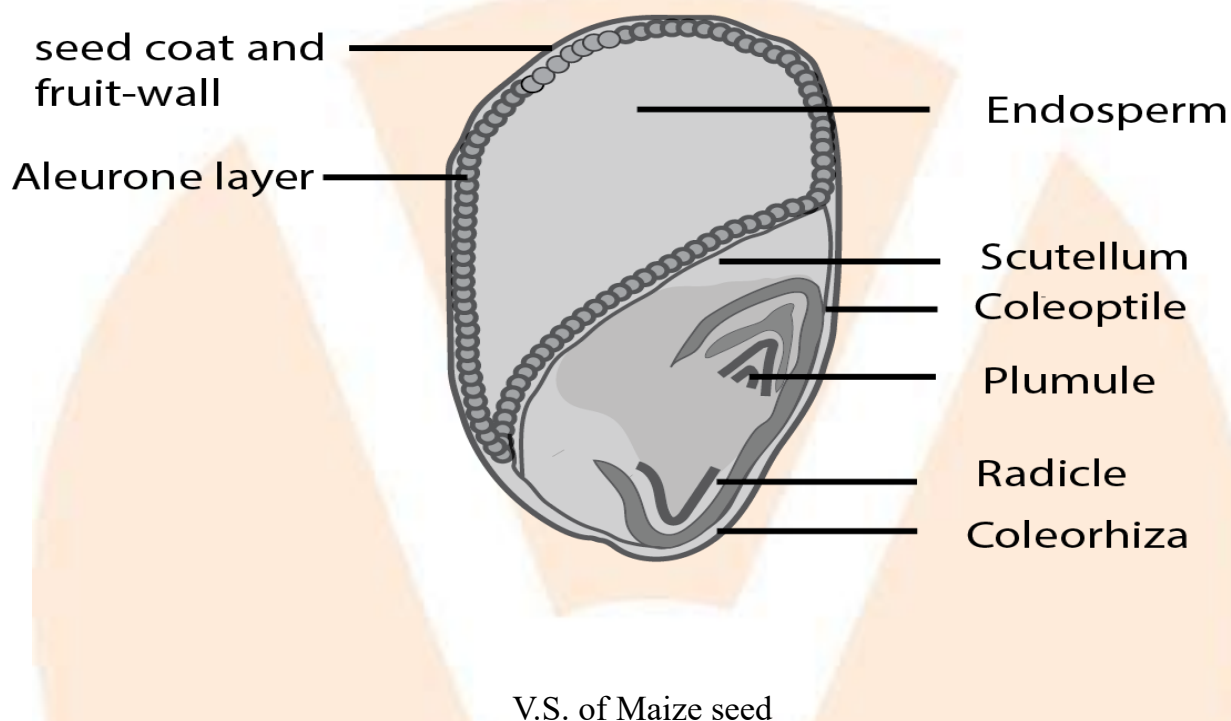
Features	Apocarpous ovary	Syncarpous ovary
Carpels	Separate carpels	Fused carpels
No. of fruits	Multiple	Single
No. of pistils	Multiple	Single

Example	Strawberry	Tomato
---------	------------	--------

5. Draw the labeled diagram of the following (i) Gram seed (ii) V.S. of maize seed

Ans:





6. Take one flower of the family Solanaceae and write its semi-technical description. Also, draw their floral diagram.

Ans: Flowers of Solanum Nigrum

Family Solanaceae

Vegetative Features:

Habit: A herbaceous, upright plant

The leaves are simple, exstipulate, and reticulately venous

Stem: A tall, branched stem.

Floral Features: Inflorescence: axillary and solitary

Flowers: Sexually dimorphic actinomorphic flowers

Calyx: The calyx consists of five sepals that are united and persistent. Aestivation is a valvate.

Corolla: The corolla has five petals united by a valvate aestivation.

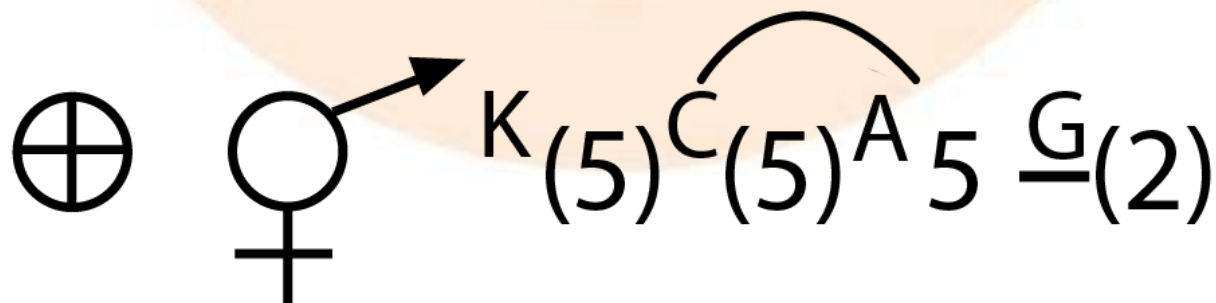
Androecium: The epipetalous stamens of the anthoecium.

Gynoecium: It is composed of a bicarpellary syncarpous superior ovary with an axile placentation.

Fruits: Berry

Seeds: Numerous, endospermous

Floral Formula:



Floral Diagram of Family Papilionaceae



Floral diagram of family Solanaceae

Economic Importance: Used for medicinal Purposes.

7. Describe the various types of placentations found in flowering plants.

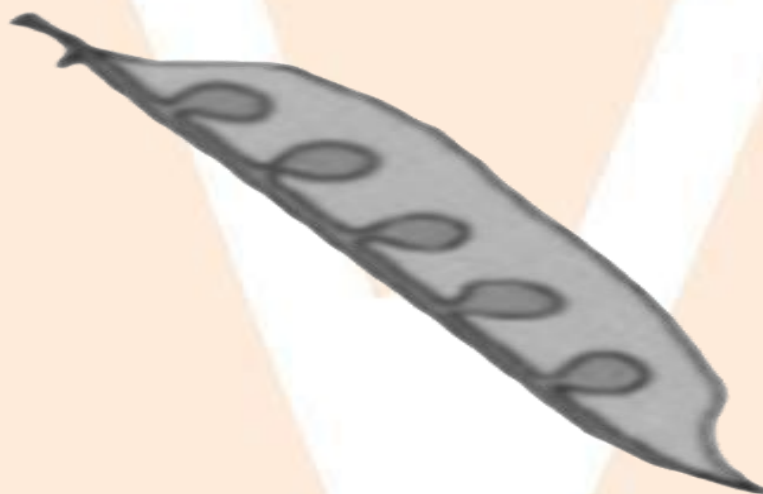
Ans: An ovary's potentiation refers to the position of the ovules. It is categorized into five basic categories.

A. Marginal placentation:

A marginal placenta develops along the ventral suture of the ovary and the ovules are formed in two rows to separate the placenta from the ovules. The placentation of peas is of this type.

B. Parietal Placentation

The ovary is said to have parietal placentation when the ovules develop on the inner wall of the ovary.



Parietal Placentation

C. Axile Placentation

Axial placentation is characterized by an axial placenta attached to ovules. Tomatoes, lemons, and china roses are examples.



Axile Placentation

D. Basal Placentation

Having basal placentation is when the placenta grows from the base of the ovary and an ovule is found attached to it. Marigolds and sunflowers are a few examples.



Basal Placentation

- E. Placentation in the center.** Placentation without septa is characterized by ovules developing on the center axis while septa are absent. This type of placentation is common in Dianthus and primrose.

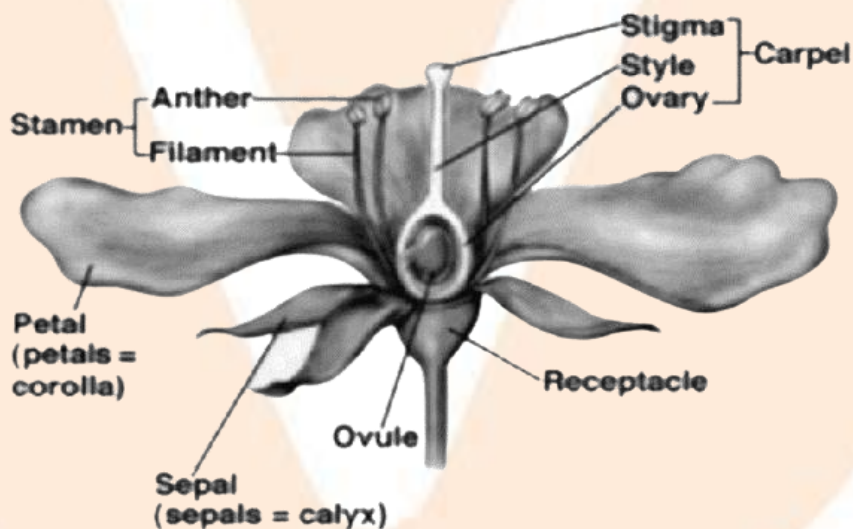


Central Placentation

8. What is a flower Describe the parts of a typical angiosperm flower.

- **Ans:** Flowering plants (angiosperms) have flowers as their reproductive unit. Angiosperms reproduce sexually through flowers.
- Flowers are usually modified stems with condensed axes. There are four concentric lobes on a flower.
- Calyxes, corollas, androecium, and gynoecium make up the four whorls of the flower, from outside to inside.

- On flowers, the androecium represents the male reproductive whorl and the gynoecium represents the female reproductive whorl.
- An example of a bisexual flower is one with both androecium and gynoecium, while a unisexual flower only has gynoecium.
- There is usually a distinct corolla and calyx, but they can be fused (called perianth). All four parts of a flower are known as a complete flower.



Parts of a Flower

- A. **Calyx:** The calyx is made up of sepals in the outer whorl of the flower. At the buds stage, they serve as a protective covering. An open flower's sepals are known as polysepalous, whereas flowers with fusions of sepals are known as gamosepalous. In addition to being photosynthetic, sepals are also green in color.

- B. Corolla:** The flower whorl is the part of the flower that lies toward the inner side of the calyx. Individual petals of the corolla are brightly colored and help attract insects for pollination. The condition in which the petals are fused is called gamosepalous, and the condition with free petals is known as polypetalous.
- C. An androecium** or stamen is a yellow or red shaped male reproductive organ. A filament and a bilobed anther constitute the filament. Anthers bilobeds produce pollen grain and undergo meiosis. One connective connects the two anther lobes.
- D. The gynoecium** represents the female reproductive branch of a flower. A female ovary is present in the body. An ovary is connected to the stigma via a long tube (called a style).

Numerous ovules form an attachment to the placenta at the ovary.

9. Define the term inflorescence. Explain the basis for the different types of inflorescence in flowering plants.

- **Ans:** Floral inflorescences are arranged along a floral axis. Vegetative apexes of stems are transformed into floral meristems during the blooming season.
- A racemose or cymose inflorescence is classified based on whether or not the floral axis continues.



Racemose and Cymose Inflorescence

10. Describe the arrangement of floral members in relation to their insertion on thalamus?

Ans: A flower is described as hypogynous, perigynous, or epigynous depending on the position of its calyx, corolla and androecium (relative to the ovary). Hypogynous flowers possess an ovary positioned at the top of the thalamus while other floral parts sit below. The ovary is located on the rim of the thalamus in perigynous flowers, while in China roses, mustards, etc., the ovary is situated toward the middle. Plum, rose, peach, etc., are examples of ovary half inferiors. The thalamus surrounds the ovary in epigynous flowers and forms a fusion with its wall. Above the ovary, there is another group of floral parts. In the flowers of guava and cucumber, the ovary is considered inferior.

