

NEET Important Questions with Solutions from Morphology of Flowering Plants

Q.1. Prop root is:

- A) Fibrous roots
- B) Branched roots
- C) Tap roots
- D) Modified adventitious roots

Answer: Modified adventitious roots

Solution: Roots that grow from any part of the plant other than radicle form adventitious roots, this is also known as false roots. Modification of adventitious roots for mechanical support by the formation of prop roots is observed in the banyan tree.

Q.2. Which of the following is true about fruits?

- A) It is the ripened androecium of flower
- B) Simple fruits are made from many ovaries
- C) Aggregate fruits are made from one ovary
- D) Composite fruits are made from many ovaries of many flowers

Answer: Composite fruits are made from many ovaries of many flowers

Solution: A fruit formed from a condensed inflorescence is termed as composite fruit. All the composite fruits are false fruits, i.e., they are not directly developed from the ovary. Composite fruits differ from aggregate fruit such that in the place of a single ovary like aggregate fruits, many ovaries and other floral parts combine to form the fruit. In composite fruits, the whole inflorescence is condensed and develops into a single fruit. Composite fruits are of two types:

- Sorosis: Sorosis fruit develops from the spike, spadix or catkin inflorescence. The peduncle becomes thick and spongy, sepals of female flowers get fused with each other forming a mass by the flowers of a whole inflorescence. For example, jack fruit, kevda. (screw pine).
- Syconus: This type of fruit develops from hypanthodium inflorescence. The receptacle becomes hollow with a pore surrounded by small scales. For example, fig, peepal.

Q.3. When the margins of sepals or petals overlap one another without any particular direction, the condition is termed as:

- A) Vexillary
- B) Imbricate
- C) Twisted
- D) Valvate

Answer: Imbricate



Solution: **Imbricate:** In imbricate aestivation, one of the sepals or petals is internal being overlapped on both the margins, and one of them is external, while the other petals or sepals shows twisted aestivation. The overlapping direction is random. E.g. *Cassia*, gulmohar, etc. The imbricate aestivation is shown as in the figure given below:



Q.4. An example of edible underground stem is:

- A) Carrot
- B) Groundnut
- C) Sweet potato
- D) Potato

Answer: Potato

Solution: **Tuber:** It is the swollen tip of a special underground branch. Each tuber has many notches on the surface called 'eyes' or buds which grow into new plants. Adventitious roots are usually absent in such a modification. **E.g. Potato**

Q.5. The standard petal of a papilionaceous corolla is also called:

- A) Carina
- B) Pappus
- C) Vexillum
- D) Corona

Answer: Vexillum

Solution: **Descending imbricate aestivation or Vexillary aestivation:** In this type, the posterior odd floral leaf is the largest and lies completely to the outside. It is called vexillum or standard petal. It overlaps the two lateral petals called as wings. The lateral petals overlap the anterior petals called as **keel**. E.g. Petals in members of family Fabaceae or Papilionaceae like pea.

Q.6. Stamens attached to petals are:

- A) Epipetalous
- B) Epiphyllous
- C) Episepalous
- D) All

Answer: Epipetalous

Solution: **Epipetalous or epipetalous:** It is a condition where the stamens are partially or completely attached to the petals. E.g. Brinjal

Epiphyllous: It is a condition where the stamens are partially or completely attached to the perianth. E.g. Lily

Episepalous: It is a condition where the stamens are partially or completely attached to the sepals. E.g. *Verbena*



Q.7. Which of the following represents the functions of veins in the leaves?

- A) Transport of water and minerals
- B) Mechanical support
- C) Transport of organic food material
- D) All of these

Answer: All of these

Solution: The arrangement of veins and veinlets in a leaf is known as its venation. It can be of mainly two types - Parallel and Reticulate. Important functions of veins and veinlets are:

1. They help in conduction of water and minerals, throughout the leaf mesophyll.
2. Provide channels for translocation of organic nutrients, throughout the leaf mesophyll.
3. The veins and veinlets provide mechanical support to the lamina by acting as a skeletal framework, so that the lamina can maintain its desired shape for its optimum functioning;
4. Veins and veinlets reduce the effect of wilting. Hence, all the options given are correct and the right answer will be option fourth.

Q.8. What type of placentation is seen in sweet pea?

- A) Axile
- B) Free central
- C) Marginal
- D) Basal

Answer: Marginal

Solution: Types of placentation

1. Axile Placentation

This type of placentation is seen in bi- or multi carpellary, syncarpous ovary. The carpel walls meet in the centre of the ovary, where the placenta are formed like central column. The ovules are borne at or near the centre on the placenta in each locule. e.g. *Hibiscus*.

2. Marginal Placentation

It occurs in a monocarpellary, unilocular ovary. The ovules are borne along the junction of the two margins of the carpel. e.g. Fabaceae

3. Parietal Placentation

This type of placentation is found in multi carpellary, syncarpous, unilocular ovary. The carpels are fused only by their margins. The placenta bearing ovules develop at the places, where the two carpels are fused. e.g. Cucumber

4. Basal Placentation

It is seen in bicarpellary syncarpous, and unilocular ovary. The placenta develop directly on the receptacle, which bears a single ovule at the base of the ovary. e.g. Asteraceae.

5. Superficial Placentation

This type of placentation occurs in a multicarpellary, multiocular ovary. The ovules are borne on placentae, which develop all round the inner surface of the partition wall e.g. Nymphaeaceae

Q.9. Leaves arise from which part of plant?

- A) Rhizome
- B) Stem
- C) Internode
- D) Node



Answer: Node

Solution: The leaf is a green, flat, thin, lateral appendage of stem having chlorophyll. Leaves arise from the nodes of stem and produce organic food for plant by the process of photosynthesis.

Q.10. Edible part of apple and pear is

- A) epicarp
- B) mesocarp
- C) endocarp
- D) thalamus

Answer: thalamus

Solution: The edible part of most of the fruits is the actual ovary, but in Apples and Pears, the hypanthium part is eaten. Apple and pear are some type of fruits. Pome is a false fruit. They are simple succulent fruit. Pome fruits develop from a syncarpous inferior ovary, which is surrounded by fleshy thalamus. The fruit contains seeds inside. So the true fruit lives inside the swollen fleshy and edible thalamus. Hence, it is false fruit or Pseudocarp.

Q.11. Identify in order the plants showing alternate, opposite and whorled phyllotaxy.

- A) China rose, *Calotropis* and *Nerium*
- B) China rose, *Nerium* and *Calotropis*
- C) *Nerium*, China rose, *Calotropis*
- D) *Nerium*, *Calotropis*, China rose

Answer: China rose, *Calotropis* and *Nerium*

Solution: Phyllotaxy means the arrangement of leaves on both stem and branches. Mainly the leaves are arranged in three ways:
Alternate: In this, each node gives rise to single leaf and these are arranged alternately giving a spiral form (e.g., mango, china rose etc).
Opposite: In this, each node gives rise to two leaves arranged opposite to each other.
It can be opposite superposed (e.g., *Ixora*) or opposite decussate (e.g., *Ocimum*, *Calotropis procera*). In whorled phyllotaxy, more than two leaves develop from a single node (as in *Nerium*).

Q.12. When gynoecium is present in the topmost position of thalamus, the flower is known as -----.

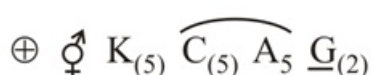
- A) Inferior
- B) Epigynous
- C) Perigynous
- D) Hypogynous

Answer: Hypogynous

Solution: In hypogynous conditions of flowers, the gynoecium (female reproductive organ) is occupied the topmost (superior) position at the thalamus and other parts of the flower that arise from below the gynoecium, e.g., *Hibiscus rosa sinensis* (gurhal).

Q.13. Which floral formula is correct for 'chili'.

A)





B) $\oplus \begin{matrix} \text{♂} \\ \text{♀} \end{matrix} K_4 C_{(4)} A \underline{G}_{(2)}$

C) $\% \begin{matrix} \text{♂} \\ \text{♀} \end{matrix} K_4 C_{(4)} \underline{G}_{(2)}$

D) $\% \begin{matrix} \text{♂} \\ \text{♀} \end{matrix} K_5 C_5 A_5 \underline{G}_{(1)}$

Answer:

$$\oplus \begin{matrix} \text{♂} \\ \text{♀} \end{matrix} K_{(5)} \overbrace{C_{(5)} A_5} \underline{G}_{(2)}$$

Solution: Characteristics of Family Solanaceae – gamosepalous, gemopetalous, Ovary superior, bicarpellary, syncarpous, bilocular, placenta swollen with many ovules, axile Placentation. Chilli belong to family Solanaceae.

Q.14. The phyllotaxy in which two leaves arise from a bud at each node is

- A) whorled.
- B) alternate.
- C) opposite.
- D) None of these

Answer: opposite.

Solution: Phyllotaxy: it is defined as the arrangement of leaves or mature leaves on branches or the stem in a distinct pattern is known as phyllotaxy. It is of three types: alternate in which leaf arises in the alternate pattern at each node, for example, china rose, opposite type in which a pair leaves arise in the opposite direction at each node, for example, guava plants and calotropis and last one is whorled in which leaf form a whorl pattern at the node for example in Alstonia.

Q.15. Which of the following have endospermic seeds?

- A) Gram
- B) Pea
- C) *Cicer*
- D) Castor

Answer: Castor

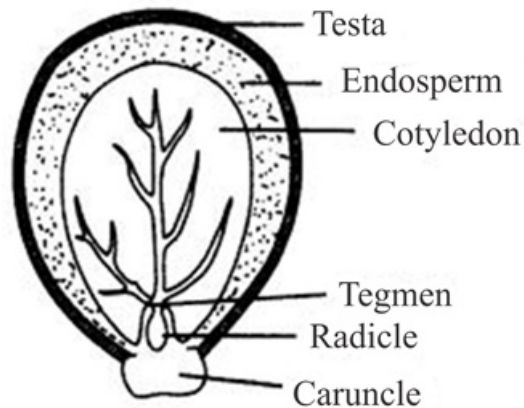


Solution:

The tissue that surrounds and provides nutrients to the embryo in the seeds of angiosperms is known as endosperm. The endosperm is the product of triple fusion and it develops from the central cell of the embryo sac. The endosperm is generally a triploid tissue. It is a food storing tissue. Depending on whether the endosperm is fully utilised or not, during the development of a seed, there are two types are seeds:

1. In albuminous or endospermic seeds, the endosperm is not utilised during seed development. Like maize, rice from monocotyledonous class, and castor from dicotyledonous class.
2. In exalbuminous or non-endospermic seeds, the endosperm is utilised during seed development. Like *Amorphophallus* from monocot, and pea, gram from dicot groups.

In the castor seeds, the nucellus remains persistent, called the perisperm is seen in castor seeds. Near the micropyle, a spongy outgrowth of the integument is seen, which is known as the caruncle and its main function is to absorb water which is necessary for germination.



Q.16. Stilt roots are reported from:

- A) sugarcane
- B) *Bryophyllum*
- C) radish
- D) ginger

Answer: sugarcane

Solution:

Stilt roots are the adventitious aerial roots that are modified for plant support. They are formed if the stem of the plant is thin and long or if the plant is growing near river banks, ponds, etc. Stilt roots develop obliquely from the basal nodes of the stem as in sugarcane, maize, *Sorghum*, *Pandanus* etc. They provide extra mechanical support by penetrating the soil. These are short, thick, fibrous roots that hold the soil firmly.

Q.17. The term 'polyadelphous' is related to:

- A) Corolla
- B) Calyx
- C) Gynoecium
- D) Androecium

Answer: Androecium

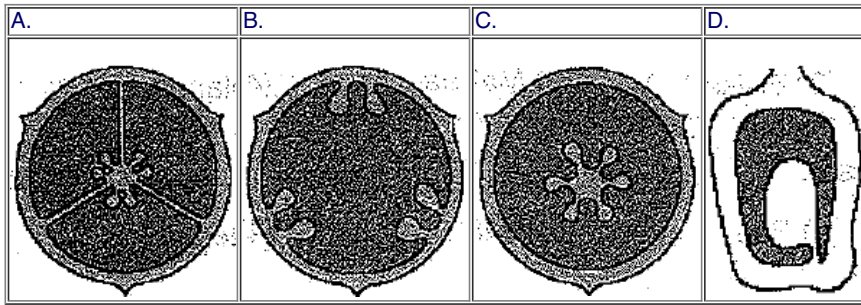
Solution:

Adelphy: When only filaments of an androecium unite and not anthers it is called as adelphy or adelphous.

Polyadelphous: It is a type of adelphy. In this type the filaments are fused to form two or more than two (many) bundles. E.g. *Bombax malabarica* (silk-cotton tree).



Q.18. Select the correct matching

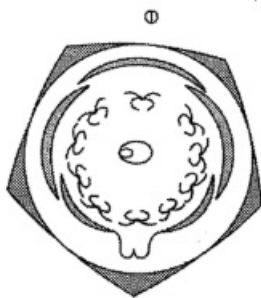


- A) A- Tomato, B - *Argemone*,
C- *Dianthus*, D - Sunflower
- B) A- *Dianthus*, B - *Argemone*, C- Tomato, D - Sunflower
- C) A - Tomato, B Sunflower,
C- *Dianthus*, D - *Argemone*
- D) A - *Argemone*, B - Tomato,
C- *Dianthus*, D - Sunflower

Answer: A- Tomato, B - *Argemone*,
C- *Dianthus*, D - Sunflower

Solution: In Marginal placentation, the placenta forms a ridge along through the ventral suture of the ovary, ovules are borne on the ridge to form two rows. Example: Pea. In Axile placentation, The placenta is axial and ovules are attached to it in a multilocular ovary. Example: Tomato, Lemon. In Parietal placentation, Ovules develop on the inner wall of the ovary or on the peripheral. Due to the formation of a false septum, it becomes two-chambered. Example: *Argemone*, Mustard. In Basal placentation, Placenta develops at the base of the ovary wherein a single ovule is attached to it. Example: Sunflower, Marigold. In Free central placentation, Ovules are borne on the central axis and septa are absent. Example: *Dianthus*, Primrose.

Q.19. Choose the correct floral formula with the help of given floral diagram ?



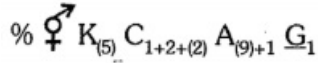
- A) $\text{K}_{2+2} \text{C}_4 \text{A}_{2+4} \underline{\text{G}}_{(2)}$
- B) $\text{K}_{(5)} \text{C}_{1+2+(2)} \text{A}_{(9)+1} \underline{\text{G}}_1$
- C) $\text{K}_{(5)} \text{C}_{(5)} \text{A}_5 \underline{\text{G}}_{(2)}$



D)



Answer:



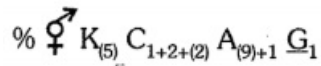
Solution:

The floral diagram given belongs to the family Fabaceae. The inflorescence possessed by the family is racemose and flowers are bisexual with zygomorphic symmetry.

The flowers have gamosepalous five sepals with valvate/imbricate aestivation.

The corolla is polypetalous with five petals and the type of aestivation is vexillary.

The stamens (10) are diadelphous i.e., stamens are united into two bundles. The ovary in such flowers is superior and gynoecium is made up of one carpel.



Q.20. Select the correct examples of the following figures of placentation respectively :-



- A) Mustard, Tomato, Sunflower, *Dianthus*
- B) Tomato, Sunflower, Mustard, *Dianthus*
- C) Sunflower, *Dianthus*, *Argemone*, Tomato
- D) Tomato, *Argemone*, *Dianthus*, Sunflower

Answer: Tomato, *Argemone*, *Dianthus*, Sunflower



Solution: Placentation refers to the arrangement of ovules within the ovary. The placentation are of different types namely, marginal, axile, parietal, basal, central and free central.

In marginal placentation, the placenta forms a ridge along the ventral suture of the ovary and the ovules are borne on this ridge resulting in the formation of two rows, as in pea.

In axial placentation, the placenta is axial and the ovules are attached to it in a multilocular ovary, as in china rose, tomato and lemon.

In parietal placentation, the ovules develop on the inner wall of the ovary or on peripheral part. The one-chambered ovary, later on, becomes two-chambered due to the formation of the false septum, e.g., mustard and *Argemone*.

In free central placentation, the ovules are borne on central axis and septa are absent, as in *Dianthus* and *Primrose*.

In basal placentation, the placenta develops at the base of ovary and a single ovule is attached to it, as in sunflower, marigold.

Q.21. Prop roots are :-

- A) Tap roots
- B) Adventitious roots
- C) Secondary roots
- D) All

Answer: Adventitious roots

Solution: The direct elongation of the radicle leads to the formation of primary root which grows inside the soil.

When roots arise from parts of the plant other than the radicle, they are called as adventitious roots. Such roots are found in grass, *Monstera* and the banyan tree.

In plants like banyan, a number of roots are produced from the main stem or branches to provide mechanical support to the shoot system. These roots grow downwards, penetrate into the soil and act as supporting pillars. Such roots are called as prop roots.

Q.22. Select the incorrect match with respect to the plant and the relative plant part modified for food storage.

(i)	<i>Ipomoea batatas</i> (Sweet potato)	Root
(ii)	<i>Solanum tuberosum</i> (Potato)	Stem
(iii)	<i>Allium cepa</i> (Onion)	Leaves
(iv)	<i>Dahlia</i> (Dahlia)	Leaves

- A) (i)
- B) (ii)
- C) (iii)
- D) (iv)

Answer: (iv)

Solution: Sweet potato (*Ipomoea batatas*) is a root vegetable. It's a dicot plant, and the "sweet potato" we eat is a modified, enlarged root (or lateral root) called a root-tuber, for the purpose of storing starch to support the plant's new growth in the spring. Potato is a modified stem called a tuber. It stores a large amount of edible starch which is used as food. The layers of the onion are modified leaves that store energy for the plant, so it can survive the winter. A tuberous root is an enlarged fleshy root that stores food inside them. The root is of the plant *Dahlia* is further known as the Fasciculated root of *Dahlia*.

Q.23. In family Papilionaceae (Fabaceae), 5 petals form a unique association, In which 3 different elements participate, these are standard (vexillum), wings (alae) & keel (carina). What is the number of these elements

- A) 1,2,2 respectively
- B) 2,1,2 respectively



C) 1,1,3 respectively

D) 2,2,1 respectively

Answer: 1,2,2 respectively

Solution: Aestivation means arrangement of accessory floral organs(sepals or petals) in relation to one another in the floral bud.

In the Papilionaceae family, **vexillary aestivation** is formed. The corolla of papilionaceous flowers usually has five petals that include a large upper petal vexillum which is enclosing two lateral wings like petals named alae and a lower carina with two united petals.

In **twisted aestivation** one margin of a petal overlaps regularly the margin of an adjacent petal.

In **imbricate aestivation** there is irregular overlapping of petals by one another.

Q.24. Assertion :- Leaves show acropetal arrangement on plant.

Reason :- Leaves arise from root apical meristem.

A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

B) Both Assertion and Reason are true but Reason is NOT the correct explanation of Assertion.

C) Assertion is true but Reason is false.

D) Assertion is false but Reason is true.

E) Both Assertion and Reason are false.

Answer: Assertion is true but Reason is false.

Solution: A leaf is the principal lateral appendage of the vascular plant stem, usually borne above ground and specialised for photosynthesis. They are partial shoots, being derived from leaf primordia of the shoot apex. Early in development they are dorsiventrally flattened with both dorsal and ventral surfaces. Compound leaves are closer to shoots than simple leaves.

The arrangement of leaves is in a way that the older leaves are at the base and younger leaves at the apex. This type of arrangement is called acropetal arrangement.

Q.25. Read the following statements and select the correct option.

Statement 1 : The stem tubers are the swollen ends of specialised underground stem branches, which help in vegetative propagation of the plant.

Statement 2 : *Solanum tuberosum* This is an example of a stem tuber that stores inulin as the main reserve food material.

A) Both statements 1 and 2 are correct

B) Statement 1 is correct but statement 2 is incorrect

C) Statement 1 is incorrect but statement 2 is correct

D) Both statements 1 and 2 are incorrect

Answer: Statement 1 is correct but statement 2 is incorrect

Solution: Tubers of the stem are oval or spherical underground swollen stem structure which does not have any adventitious roots, e.g., potato (*Solanum tuberosum*), Jerusalem artichoke (*Helianthus tuberosus*). Starch is the reserved food in potato and artichoke inulin.

A stem tuber is originated from thickened rhizomes or stolons. The upper sides of these tubers produce shoots which grow into typical stems and leaves, and the undersides produce roots. Their tendency to originate is at the parent plant's sides and are most often located in proximity to the soil surface. Some of the examples are sweet potato, cassava, and dahlia.

