CHAPTER : 5 MORPHOLOGY OF FLOWERING PLANTS

Page No. : **55-69**

Total Pages : **15**

Questions Asked : **61**

2-3 QUESTION PER PAGE AT AN AVERAGE

- **Which page has the maximum**

75,76,73 = 3 Page

40% QUESTIONS

2010-2024		Page No.
	0	55,56,60,68,69
14,16,18,20,22	2	59,71
13,16(2),15,17, 18(2),19,20,22(2)	3	57,58,61
10(2),11,12(2),14(2) 15(2),16(2),19,21	4	64,67,70
11(2),12,13,16,22, 24	5	62,63,64,65,67,
10,11,13,15,20(2)	6	63
10(2)12(5),14,16 (2)17(2),19,20,21	7	65,66

NO. OF QUESTIONS ASKED

Root

1. The direct elongation of the radicle leads to the formation of **primary root**
2. Lateral roots referred to as secondary, tertiary, etc. roots.
3. In roots absorption of water and mineral mostly occur in region of maturation.

[NEET-2017, NCERT-57,58]

4. Primary roots & its branches constitute tap root system.

   Example : Mustard Plant

5. Fibrous root system :- Originate from the base of stem.

[NEET–2020]

Example : Wheat Plant

[NCERT–58]

6. **Adventitious roots:** Root arises from the part of plants other than radicle.

   Example: Grasses, Monstera & Banyan tree.

7. **Regions of the Root**

Root Cap	- Protect the root
Region of meristematic	- Cells of this region very small, thin walled zone & dense protoplasm, divide repeatedly
Region of elongation	- Max. growth occurs zone
Region of maturation zone	- Root hair present in this zone. Root hairs are unicellular out

8. **Modification of Roots :**

⇒ **For food storage eg** - Carrot, turnip (Tap root), sweet Potato (Adventitious root)

[NEET–2018, NCERT-58]

⇒ **For Support eg** - Banyan tree (Prop root), Maize and Sugarcane (Stilt Root)

⇒ **For Respiration Pneumatophores eg** - Rhizophora, grown in swampy areas.

9. Pneumatophroes occur in halophytes.

[NEET–2018, NCERT-58]

10. In pistia, roots play significant role in absorption of water.

STEM

11. Develop from plumule of the embryo of a germinating seed stem bears nodes & internodes. It also bears buds, which may be terminal OR Axillary

12. **Main function of stem -** **[According to NMC]**

- Spreading out branches bearing leaves, flowers & fruits.
- Conduct water, mineral & Photosynthates

13. **Modification of stem**

1. For Food Storage - Under ground stem eg :- Potato, Ginger, Turmeric, Zaminkand, Colocassia.

[NEET–2014, NMC]

2. **Stem Tendrils-** Help plants to climb **Eg:** Gourds (Cucumber, Pumpkins, watermelon) & Grapevines

   Note: Stem tendrils and leaf tendrils are analogus.

3. Thorns-Protects plant from browsing animals, modification of axillary bud of stem. **eg: Citrus & Bougainvillea**

   [NEET–2017, NMC]

4. **Phylloclade-** Perform photosynthesis

   [NEET–2016, NMC]

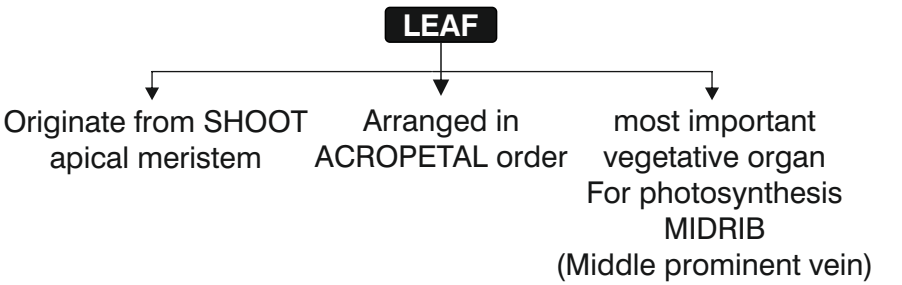
   eg: Opuntia (Flat), Euphorbia (Cylindrical)

   Note: Phyllode is modification of petiole.

5. **Offset eg:** Pistia & Eichhornia
6. **Sucker eg:** Banana, Pineapple, Chrysanthemum
7. **Runner eg:** Grass & Strawberry

LEAF

14. Originate from shoot apical meristem & arrange in an acropetal manner
15. A typical leaf consists of three main parts.
    1. Leaf base - Leaf attached main parts.
    2. Petiole - Hold the blades of light

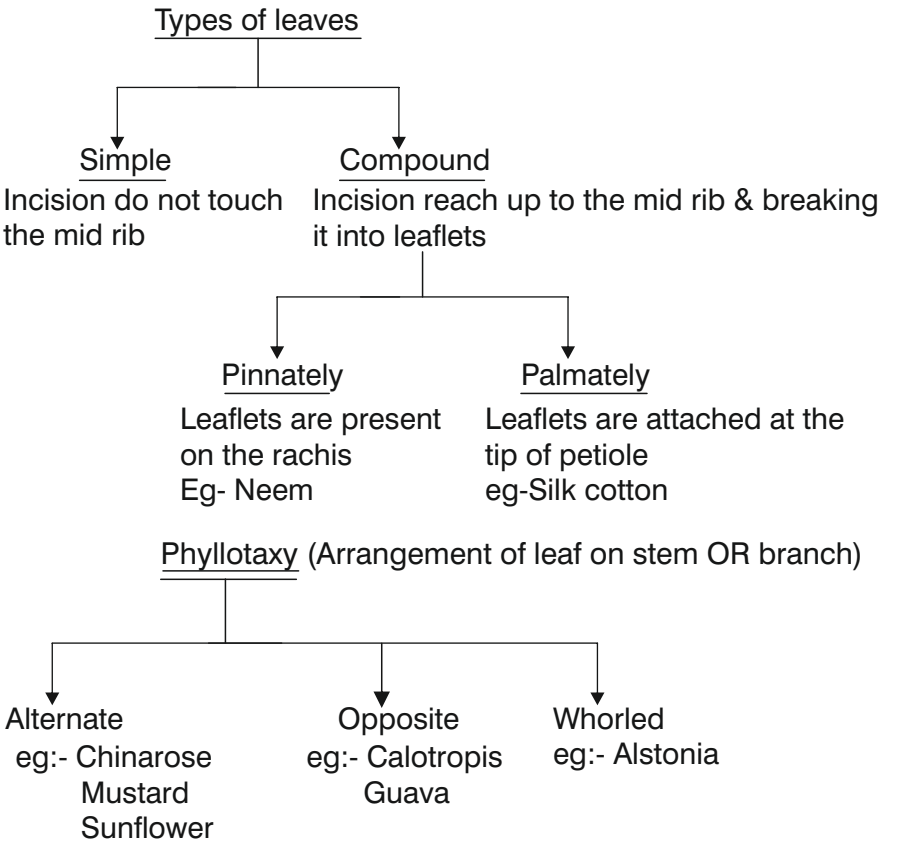


16. **Sheathing** present in **monocotyledons.**

    & Pulvinus present in some leguminous plants.

17. Venation -

    - Reticulate (Veinlets form network) **eg : Dicots**
    - Parallel (Vein run parallel to each other) **eg:** Monocots



18. **Modification of leaves**

    1. **Tendril -** For climbing **eg :** Pea
    2. **Spine -** For defence **eg :** Cacti, Opuntia

    [NEET–2017, 2015, Old NCERT-71]

    3. **Food Storage - eg:** Onion & Garlic (Fleshy leaves).
    4. Petiole perform photosynthesis **eg:** Australian acacia-(phyllode)

    [NEET–2012, Old NCERT-71]

    5. To trap the insect **eg:** Pitcher plant & venus fly trap

    [NEET–2016, Old NCERT-71]

19. The arrangement of flowers on the floral axis is termed as -

Inflorescence

Racemose	**Cymose**
Main axis continues to grow & flower born on Acropetal manner	Main axis terminates in flower, born on Basipetal manner

20. An inflorescense with younger flowers at base and older one at apex is known as cymose

    [NEET–2017]

21. Cymose inflorescense is present in solanum. [NEET–2012,

FLOWERS

22. Reproductive unit in angiosperms.

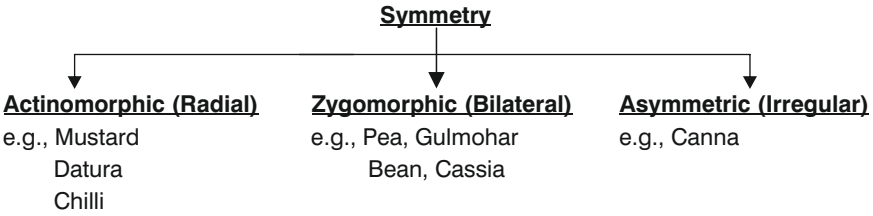
    Note: Stalk of flower - pedicle.

23. Swollen end of the stalk OR Pedicle, called thalamus OR Receptacle

24. Four different kinds of whorls of a typical flower Calyx, Corolla, Androecium & Gynoecium

25. A flower having either only stamen or only carples is unisexual

    ex: cucumber, maize, papaya



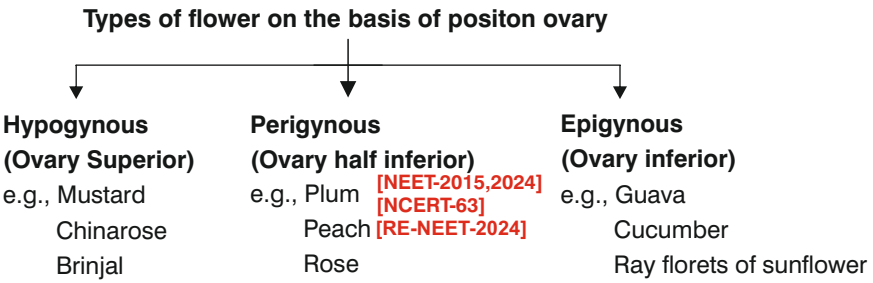
[NEET–2024] **[NEET–2011, 16, 22, NCERT-62]**

26. Reduced leaf is called Bracts.

27. Flowers found at the base of pedicel.

28. Flower of tulip is modified shoot

[NEET–2011, NCERT-63]



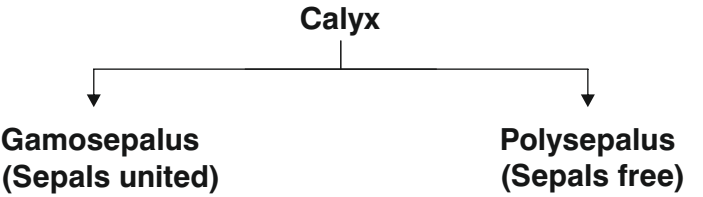
29. In plum and rose ovary is half inferior

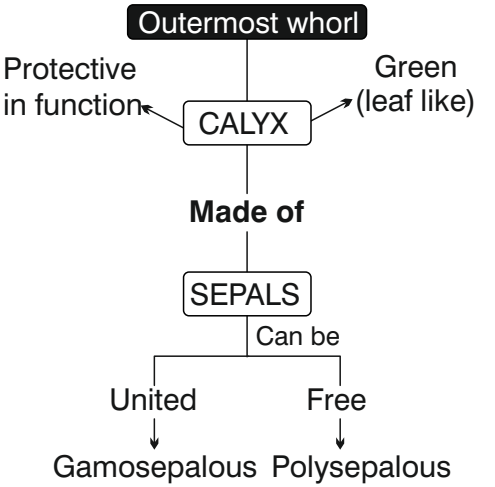
[NEET–2010, 11, 15, 2020, NCERT-63]

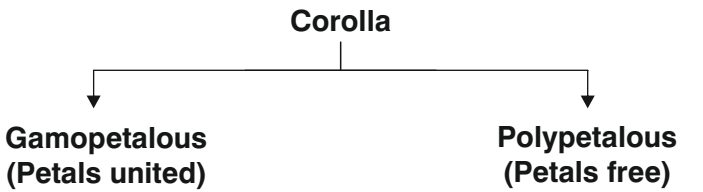
30. In Guava and ray floret of sunflower ovary is inferior.

[NEET–2015, 2020, NCERT-63]

31. In china rose, flowers are actinomorphoic hypogynous with twisted aestivation





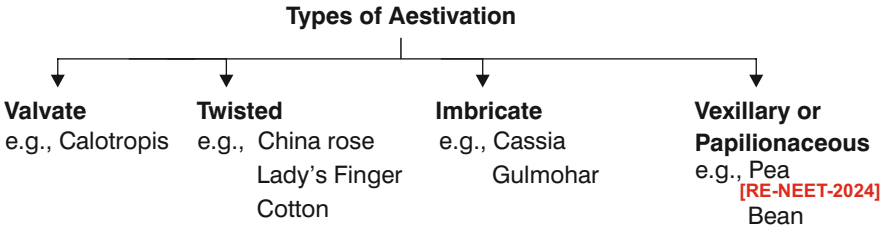


32. Generally, sepals are green, leaf like & protect the flower in bud stage

33. Petals are usually brightly coloured to attract insect for pollination. Petals are of various shapes.

Aestivation

The mode of arrangement of sepals OR Petals in floral bud with respect to the other members of the same whorl.



[NEET-2010,2024 NCERT-64]

34. Standard petal of a papilionaceous corolla is called vexillum.

[NEET-2016, NCERT-64]

35. When the margins of sepals or petals overlap one anothers without any particular direction, the condition is known as imbricate. **[NEET–2014, NCERT-64]**

Androecium : Composed of stamens

1. **Epipetalous :** (Stamen are attached to the petals) eg : Brinjal. **[RE-NEET-2024]**
2. **Epiphyllous :** (Stamen are attached to the perianth) eg: Lily. **[RE-NEET-2024] [NEET–2024, NCERT-64]**
3. **Polyandrous** (stamens remain free)
4. **Monoadelphous** (Stamens united into one bundles) eg: china rose **[NEET–2010, 21, 24 NCERT-64]**
5. **Diadelphous** (Stamens united into two bundles) eg: Pea

[NEET–2021, 22, 24 NCERT-64]

6. **Polyadelphous** (Stamens united into more than two bundles) eg: Citrus.

[NEET–2016, 2024 NCERT-64]

36. There may be a variation in the length of filaments within flower eg:- Salvia & Mustard, radish, turnip

[NEET–2016, NCERT-65]

Note: Remember, it is salvia not salvinia (member of pteridophyte).

37. Sterile stamen is called staminode

[NEET–2014, NCERT-65]

GYNOECIUM

38. Female reproductive part of the flower.

39. Carpel consist of three parts

Stigma - Receptive surface of pollen grain

Style - Elongated tube

Ovary - Elongated basal part

40. **Apocarpous :** When more than one carpel is present, they may be free eg: Lotus & Rose, Michellia

41. **Syncarpous:** When more than one carpel is present, they may be fused eg: Mustard & Tomato, Papaver

PLACENTATION

42. Marginal : Pea **[NEET–2024, NCERT-65]**

43. Axile : China-rose, Tomato, Lemon , petunia

[RE-NEET-2024] [NEET–2012, 2015,2023 NCERT-65]

44. Parietal : Mustard, Argemone. **[RE-NEET-2024]**

45. Basal: Sunflower, Marigold. **[RE-NEET-2024]**

46. Free central: Dianthus, Primrose. **[RE-NEET-2024]**

[NEET–2016, NCERT-65]

47. Placentation in which ovules develop on inner wall of ovary or in peripheral part is parietal. **[NEET–2019, NCERT-65]**

48. In unilocular ovary with a single ovule the placentation is basal.

[NEET–2010, NCERT-65]

FRUIT

49. Mature or ripened ovary, developed after fertilisation
50. Parthenocarpic fruit : It a fruit is formed without fertilisation of the ovary
51. Fruit wall is called pericarp.
52. If Pericarp thick & fleshy, it differentiated into three part

    Epicarp - Outer

    Mesocarp - Middle

    Endocarp - Inner
53. Placenta and pericarp are both edible portions in tomato

[NEET–2014, NCERT-65]

54. In **Mango & Coconut**, the fruit is **Drupe** develop from monocarpellary superior ovary & is one seeded.

[NEET–2024, NCERT-66]

55. Mango (Mesocarp fleshy - Edible)

    Coconut (mesocarp Fibrous - used commercially)

[NEET–2017, NCERT-65]

Seed (Fertilised ovule)

One cotyledon - Wheat & Maize

56. Cotyledon of mazie is known as scutellum

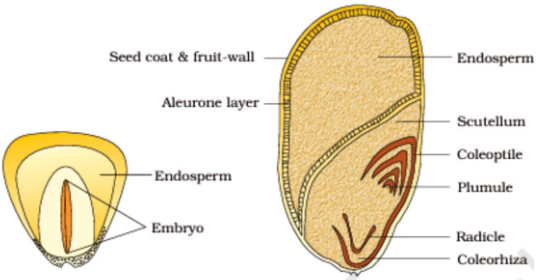
[NEET–2010, NCERT-66]

Two Cotyledon - Gram & Pea

57. Outermost covering of a seed - **Seed Coat** -Two layer

(a) Outer - Testa (b) Inner - Tegmen

58. Generally, monocotyledonous seeds are endospemic but some as in **orchids are non-endospermic.**



Structure of a monocotyledonous seed

[NEET–2024, NCERT-67]

59. Membranous seed coat found in **Maize**

60. Outer covering of endosperm seperates the embryo by a proteinous layer called **Aleurone layer**

61. One large **shield shaped cotyledon** known as **scutellum** in monocotyledon.

62. Floral formula of Cruciferae (Brassicaeae) **eg:** Mustard

$\oplus \, ♀ \, K_{2+2} \, C_4 \, A_{2+4} \, \underline{G}_{(2)}$

63. Aggregate fruit develops multicarpellary apocarpus, gynoecium **Ex. Raspberry.**

[NEET–2014, NCERT-66]

64. Groundnut, Gram, maize have thin membranous seed coat while coconut have thick membranous seed coat.

[NEET–2013, NCERT-66]

65. Tetradynamous stamens are characteristic of Brassicacae

[NEET–2017, NCERT-80]

66. In hypogynous flower, ovary is superior

Ex:- mustard, china rose, brinjal, potato, onion, tulip

[NEET–2015, NCERT-80, 81]

IMPORTANT POINTS

67. Leaves in fabaceae are stipulate while in solancacae and liliaceae exstipulate.
68. Inflorescence is racemose in fabacae but cymose in liliaceae and Solanaceae. Often umbellate clusters are found in liliaceae.
69. Flower is zygomorphic in fabaceae and actionomorphic in solanaceae and liliaceae.
70. In fabaceae, valvate/imbricate aestivation of calyx is found, while in solanaceae and aestivation of tepal in liliaceae is valvate.
71. In fabacae, polypetalus condition is found, while in solanacae it is gamopetalous.
72. Vexillary aestivation is characteristic of fabaceae family.

[NEET–2012, Old NCERT-79]

73. In fabacae, non-endorpermic seed is found while in solanaceae and liliaceae, endospermic seed is found.
74. In fabacae, marginal placentation is found but in solanaceae and liliaceae, axile placentation is found.
75. The name of fruit of fabaceae is legume and its name in solanaceae is berry capsule and in liliaceae - rarely berry.