

## UNIT II : STRUCTURAL ORGANISATION IN PLANTS - MORPHOLOGY

**5. MORPHOLOGY OF FLOWERING PLANTS****(2 x 2) + (1 x 8) = 12 Marks****ROOT POINTS**

1. **Morphology of Plants** deals with the study of form, size, colour and structure of plants.
2. The plant body has mainly two parts - **root system** and **shoot system**.
3. **Root:** The under ground part of the flowering plant is called root.
4. **Types of roots:** Tap roots, Fibrous roots.
5. Main functions of roots are **absorption** and **conduction** of water, Minerals.
6. **Root modification:** Roots in some plants change their shape and structure to perform some additional functions other than absorption and conduction. Such modification is called Root Modification.
7. **Types of Root modifications :**
  - (i) **Storage roots:** Ex: Tap roots in carrot
  - (ii) **Proprop roots:** Ex: Banyan Tree
  - (iii) **Stilt roots:** Ex: Sugar cane and maize
  - (iv) **Respiratory roots:** Ex: Avicennia and Rhizophora
  - (v) **Velamen roots:** Ex: Vanda
  - (vi) **Parasite roots:** (a) Complete parasites Ex: Cuscuta (b) Partial parasites: Ex: Viscum
  - (vii) **Nodular roots:** Ex: Ground Nut
  - (viii) **Photosynthetic roots:** Ex: Taeniophyllum
8. **Stem:** The aerial part of the flowering plant is called stem.
9. **Stem Modification:** A permanent structural change in the stem to perform some special functions suitable to the environment is called stem modification.
10. **Types of Stem Modification:**
  - (i) **Underground stem modification:** Ex: (a) Rhizome of ginger (b) Bulb of Onion
  - (ii) **Aerial stem modification:** This is of four types.
    - a. **Stem tendrils:** Ex: cucumber, watermelon.
    - b. **Thorns:** Ex: Bougainvillea, citrus.
    - c. **Phylloclades:** Ex: Opuntia, Euphorbia, Casuarina.
    - d. **Bulbils:** Ex: Floral buds (Agave), Vegetative buds (Dioscorea)
  - (iii) **Sub aerial stem modifications:** They are four types.
    - a) **Runner:** Ex: Strawberry (b) **Stolon:** Ex: Jasmine (c) **Offset:** Ex: Pistia (d) **Sucker:** Ex: Banana

11. Leaf is a lateral out growth of stem, developed exogenously at the node.
12. Leaves are green in colour and perform photosynthesis.
13. The leaf exhibits several variations in their shape, size, margin, apex and lamina.
14. The swollen leaf base is called pulvinous leaf base. It is seen in 'Leguminaceae' family. [IPE]
15. The mode of arrangement of veins and veinlets in the lamina of a leaf is called **Venation**. [IPE]
16. The flower is a modified shoot, meant for sexual reproduction.
17. The arrangement of flowers on the floral axis is called inflorescence.
18. Racemose, Cymose and special inflorescences are present in angiosperms.
19. **Types of racemose inflorescences:**
  - i. **Raceme:** Ex: Crotalaria (simple raceme), Mangifera (compound)
  - ii. **Corymb:** Ex: Cassia (simple Corymb), Cauliflower (Compound)
  - iii. **Umbel:** Ex: Onion (simple umbel), Carrot (Compound Umbel)
  - iv. **Head:** Ex: Tridax and Sunflower.
  - v. **Spike:** Ex: Achyranthes (Simple), Grass-Poaceae (Compound)
  - vi. **Spadix:** Ex: Colocasia (Simple Spadix), Cocos (Compound Spadix)
20. Depending upon the symmetry, flowers are actinomorphic, zygomorphic and asymmetrical.
21. In Cyathium, involucre of bracts unite to form a cup like structure. It is found in Euphorbiaceae.
22. **Actinomorphic flower** can be cut into two equal halves in any vertical plane. Ex: Datura, Hibiscus
23. **Zygomorphic flower** can be cut into two equal halves in one vertical plane. Ex: Bean, Crotalaria.
24. **Dicot** plants possess tetramerous and pentamerous flowers.
25. **Monocot** plants possess trimerous flowers.
26. The mode of arrangement of sepals or petals in a bud condition is called aestivation.
27. After fertilization, the ovary is converted into fruit and ovule into seed.
28. **Placentation:** The mode of arrangement of ovules in a ovary is known as placentation.
29. A fruit developing from fertilized ovary is called true fruit.
30. Rarely a fruit may develop from an unfertilized ovary and is called parthenocarpic fruit.

**FRUITY Qs OF IPE****(2 x 2) + (1 x 8) = 12 Marks**

1. Differentiate fibrous roots from adventitious roots.
2. What is meant by pulvinus leaf base? In members of which angiospermic family do you find them?
3. Define venation. How do dicots differ from monocots with respect to venation?
4. Which organ is modified to trap insects in insectivorous plants? Give two examples.
5. What is the morphology of cup like structure in Cyathium? In which family it is found?
6. Differentiate actinomorphic from zygomorphic flower.
7. What is meant by epipetalous condition? Give an example.
8. Define placentation. What type of placentation is found in Dianthus?
9. What is meant by parthenocarpic fruit? How is it useful?
10. Define root modification. Mention the types of root systems. Explain how root is modified to perform different functions.
11. Explain how stem is modified variously to perform different functions.
12. Explain different types of racemose inflorescences.

**BULLET MASTER'S****BOTANY BEATS!**

'Beauty on Earth' is flourished by the Plants and Flowers;  
and the 'beauty of Botany' is delivered by **MORPHOLOGY**.

This explains the special features of a plant in all aspects right from Root to Fruit.