CHAPTER 5

MORPHOLOGY OF FLOWERING PLANTS

MULTIPLE CHOICE QUESTIONS

1. Rearrange the following zones as seen in the root in vertical section and choose the correct option.
   A. Root hair zone
   B. Zone of meristems
   C. Rootcap zone
   D. Zone of maturation
   E. Zone of elongation

Options:

   a. C, B, E, A, D
   b. A, B, C, D, E
   c. D, E, A, C, B
   d. E, D, C, B, A

2. In an inflorescence where flowers are borne laterally in an acropetal succession, the position of the youngest floral bud in the floral axis shall be
   a. Proximal
   b. Distal
   c. Intercalary
   d. Any where

3. The mature seeds of plants such as gram and peas, possess no endosperm, because
   a. These plants are not angiosperms
   b. There is no double fertilization in them
   c. Endosperm is not formed in them
   d. Endosperm gets used up by the developing embryo during seed development

4. Roots developed from parts of the plant other than radicle are called
   a. Taproots
   b. Fibrous roots
   c. Adventitious roots
   d. Nodular roots

5. Venation is a term used to describe the pattern of arrangment of
   a. Floral organs
   b. Flower in infloresence
   c. Veins and veinlets in a lamina
   d. All of them

6. Endosperm, a product of double fertilization in angiosperms is absent in the seeds of
   a. Coconut
   b. Orchids
   c. Maize
   d. Castor

7. Many pulses of daily use belong to one of the families below (tick the correct answer)
   a. Solanaceae
   b. Fabaceae
   c. Liliaceae
   d. Poceae

8. The placenta is attached to the developing seed near the
   a. Testa
   b. Hilum
   c. Micropyle
   d. Chalaza

9. Which of the following plants is used to extract the blue dye?
   a. *Trifolium*
   b. *Indigofera*
   c. *Lupin*
   d. *Cassia*

10. Match the following and choose the correct option

	Column I		Column II
A.	Aleurone layer	i.	without fertilization
B.	Parthenocarpic fruit	ii.	Nutrition
C.	Ovule	iii.	Double fertilization
D.	Endosperm	iv.	Seed

Options:

a. A-i, B-ii, C-iii, D-iv
b. A-ii, B-i, C-iv, D-iii
c. A-iv, B-ii, C-i, D-iii
d. A-ii, B-iv, C-i, D-iii

VERY SHORT ANSWER TYPE QUESTIONS

1. Roots obtain oxygen from air in the soil for respiration. In the absence or deficiency of O_2, root growth is restricted or completely stopped. How do the plants growing in marshlands or swamps obtain their O_2 required for root respiration?
2. Write floral formula for a flower which, is bisexual; actinomorphic; pentamerous sepal, petal, stamens free with ovary, syncarpous, superior, trilocular with axile placentation.
3. In *Opuntia* the stem is modified into a flattened green structure to perform the function of leaves (i.e., photosynthesis). Cite two other examples of modifications of plant parts for the purpose of photosynthesis.
4. In swampy areas like the Sunderbans in West Bengal, plants bear special kind of roots called _____.
5. In aquatic plants like *Pistia* and *Eichhornia*, leaves and roots are found near _____.
6. Reticulate and parallel venation are characteristic of _____ and _____ respectively.
7. In epigynous flower, ovary is situated below the _____.
8. Add the missing floral organs of the given floral formula of Fabaceae.

$$\phi\ \bar{\varphi}\ \mathbf{K}_{(5)} \rightarrow \mathbf{A}_{(g+1)}\ \underline{\mathbf{G}_1}$$

9. Name the body part modified for food storage in the following

a. Carrot _____
b. *Colocasia* _____
c. Sweet potato _____
d. *Asparagus* _____
e. Radish _____
f. Potato _____
g. Dahlia _____
h. Turmeric _____
i. *Gladiolus* _____
j. Ginger _____
k. *Portulaca* _____

SHORT ANSWER TYPE QUESTIONS

1. Give two examples of roots that develop from different parts of the angiospermic plant other than the radicle.

2. The essential functions of roots are anchorage and absorption of water and minerals in the terrestrial plant. What functions are associated with the roots of aquatic plants. How are roots of aquatic plants and terrestrial plants different?

3. Draw diagrams of a typical monocot and dicot leaves to show their venation pattern.

4. A typical angiosperm flower consists of four floral parts. Give the names of the floral parts and their arrangements sequentially.

5. Given below are floral formulae of some plants. Draw floral diagrams from these formulae.

   (i) $\oplus ♀♂ K_{(5)}, C_{(5)}, A_{(5)}, G_{(2)}$ (ii) $\Phi ♀♂ K_{(5)} C_{1+2+(2)} A_{(9)+1} \underline{G}_{1}$ (iii) $\oplus ♀♂ K_5 C_5 A_{5+5} G_{(5)}$

6. Reticulate venation is found in dicot leaves while in monocot leaves venation is of parallel type. Mention one exception to this generalization.

7. You have heard about several insectivorous plants that feed on insects. *Nepenthes* or the pitcher plant is one such example, which usually grows

in shallow water or in marsh lands. What part of the plant is modified into a 'pitcher'? How does this modification help the plant for food even though it can photosynthesize like any other green plant?

8. Mango and coconut are 'drupe' type of fruits. In mango fleshy mesocarp is edible. What is the edible part of coconut? What does milk of tender coconut represent?
9. How can you differentiate between free central and axile placentation?
10. Tendrils are found in the following plants. Identify whether they are stem tendrils or leaf tendrils.
    a. Cucumber
    b. Peas
    c. Pumpkins
    d. Grapevine
    e. Watermelons
11. Why is maize grain usually called as a fruit and not a seed?
12. Tendrils of grapevines are homologous to the tendril of pumpkins but are analogous to that of pea. Justify the above statement.
13. Rhizome of ginger is like the roots of other plants that grows underground. Despite this fact ginger is a stem and not a root. Justify.
14. Differentiate between
    a. Bract and Bracteole
    b. Pulvinus and petiole
    c. Pedicel and peduncle
    d. Spike and spadix
    e. Stamen and staminoid
    f. Pollen and pollenium

LONG ANSWER TYPE QUESTIONS

1. Distinguish between families Fabaceae, Solanaceae, Liliaceae on the basis of gynoecium characteristics (with figures). Also write economic importance of any one of the above family.
2. Describe various stem modifications associated with food storage, climbing and protection.
3. Stolon, offset and rhizome are different forms of stem modifications. How

can these modified forms of stem be distinguished from each other?

4. The mode of arrangements of sepals or petals in a floral bud is known as aestivation. Draw the various types of aestivation possible for a typical pentamerous flower.
5. The arrangements of ovules within the ovary is known as placentation. What does the term placenta refer to? Name and draw various types of placentations in the flower as seen in T.S. or V.S.
6. Sunflower is not a flower. Explain.
7. How do you distinguish between hypogeal germination and epigeal germination? What is the role of cotyledon (s) and the endosperm in the germination of seeds?
8. Seeds of some plants germinate immediately after shedding from the plants while in other plants they require a period of rest before germination. The later phenomena is called as dormancy. Give the reasons for seed dormancy and some methods to break it.