CHAPTER 38
ANGIOSPERM REPRODUCTION AND BIOTECHNOLOGY

Learning objectives:

The Three Fs: Flowers, Double Fertilization, and Fruits

1. In general terms, explain how the basic plant life cycle with alternation of generations is modified in angiosperms.
2. List four floral parts in order from outside to inside a flower.
3. From a diagram of an complete flower, correctly label the following structures and describe the function of each structure:
    a. Sepal
    b. Petals
    c. Stamen (filament and anther)
    d. Carpel (style, ovary, ovule, and stigma)
4. Distinguish between:
    a. Complete and incomplete flowers
    b. Bisexual and unisexual flowers
    c. Microspores and megaspores
5. Explain by which generation, structure, and process spores are produced.
6. Explain by which generation, structure, and process gametes are produced.
7. Describe the production and structure of the male gametophyte of a flowering plant.
8. Describe the development of an embryo sac and explain the fate of each of its cells.
9. Explain how pollen can be transferred between flowers.
10. Distinguish between pollination and fertilization.
11. Outline the process of double fertilization. Explain the adaptive advantage of double fertilization in angiosperms.
12. Describe the fate of the ovule and ovary after double fertilization. Note where major nutrients are stored as the embryo develops.
13. Describe the development and function of the endosperm. Distinguish between liquid endosperm and solid endosperm.
14. Describe the development of a plant embryo from the first mitotic division to the embryonic plant with rudimentary organs.
15. From a diagram, identify the following structures of a seed and state a function for each:
    a. Seed coat
    b. Proembryo
    c. Suspensor
    d. Hypocotyl
    e. Radicle
    f. Epicotyl
    g. Plumule
    h. Endosperm
    i. Cotyledon
16. Explain how a monocot and dicot seed differ.
17. Explain how seed dormancy can be advantageous to a plant. Describe some conditions for breaking dormancy.
18. Explain how fruit forms and ripens.

19. Distinguish between simple, aggregate, multiple, and accessory fruit. Give an example of each type of fruit.
20. Describe the process of germination in a garden bean and corn plant.