I. Essay Questions (5 Points Each)

1. Define the term “horticulture,” and discuss the role of horticulture in enhancing human well-being and environmental beautification.

2. Distinguish the following disciplinary areas of horticulture with the kinds of crops grown and cultural practices used.
   a. Pomology
   b. Olericulture
   c. Floriculture
   d. Nursery crops

3. Cultivated plants are classified by annuals, biennials, and perennials. Distinguish the growth and flowering habits of each group with example of horticultural crops involved in your discussion.
   a. Annuals
   b. Biennials
   c. Perennials

4. If you have developed a new plant material that would enhance personal satisfaction and beautification of the environment, would you release it as a new cultivar or a variety? Explain the reason for your choice.
5. Draw a cross section of a woody plant trunk and show where the following vascular and meristematic tissues are located. Describe the function of these specialized tissues in water movement, photosynthate translocation, and stem girth enlargement.
   
a. Phloem
b. Xylem
c. Cambium

6. Distinguish the following terms as modifications of stem tissues and provide two examples of crops for each.
   
a. Tuber
b. Runner
c. Rhizome
d. Corm

7. Distinguish the following types of flower sex expression in plants. Include a horticultural crop for each of these flowering habit in your discussion.
   
a. Dioecious
b. Monoecious
c. Andromonoecious
d. Gynomonoecious

8. What is meant by a “carbon dioxide compensation point,” and what would happen if the C₃ and C₄ plants are grown together in a tightly sealed terrarium with no air infiltration?
II. SHORT ANSWERS (Various Points)

1. Explain the role of phytohormone abscisic acid (ABS) on the formation of abscission layer of the leaf petiole in deciduous plants. (2 points)

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_____________________________________________________________________

2. Distinguish the cool-season and warm-season crops with their cultural requirements and two examples of horticultural crops. (2 points)
   a. Cool-season crop: _______________________________________________________
   b. Warm-season crop: _____________________________________________________

3. What is the difference between a “liana.” and a shrub?  (2 points)

____________________________________________________________________________
____________________________________________________________________________

4. Match the following plants with their growth characteristics: (4 points)
   a. Halophyte  ____ tolerant to low pH soils
   b. Glycophyte  ____ tolerant to dry climate
   c. Xerophyte  ____ prefers fresh water
   d. Acid-loving plant  ____ susceptible to high light conditions
   e. Shade plant  ____ tolerant to salty soil

5. Explain the role of intercalary meristems on the growth of monocots like turfgrass that tolerates mowing. (2 points)

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6. What is meant by a “sport” and how is it formed and used? (3 points)

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7. Pineapple is typically a/an (_____ aggregate, _____ multiple) fruit. (2 points)

8. List names of five plant families that are horticulturally important: (3 points)
   a. ____________________________  b. ____________________________
   c. ____________________________  d. ____________________________
   e. ____________________________

9. Explain the difference between a pedicel and a peduncle as the flower supporting stem. Show a drawing to support your definition. (2 points)
10. Name the Swedish botanist who perfected the plant classification system. (2 points)

11. Photosynthesis occurs in the cytoplasmic body called (_____ mitochondria, _____chloroplast), while respiration occurs in (_____ mitochondria, _____chloroplast). (2 points)

12. Write the names of common inflorescence: (4 points)

   a. ____________  b. ____________  c. ____________  d. ____________  

   e. ____________  f. ____________  g. ____________

13. Contrast “diffusion” and “osmosis.” (2 points)

   Diffusion                                                                                   
   Osmosis

14. The first compound produced by the Calvin cycle during photosynthesis is __________, while the first compound formed by the C₄ pathway (C₄ plants) is __________. (2 points)

15. Match the following terms with chemical equations shown below: (3 points)

   _____ Respiration
   _____ Photosynthesis

   a. \(6 \text{CO}_2 + 12 \text{H}_2\text{O} + \text{energy} \rightarrow 6 \text{CO}_2\text{H}_2\text{O}_6\) 
      (carbon) (water) (sugar) (oxygen) (water)

   b. \(\text{C}_4\text{H}_2\text{O}_6 + 6 \text{O}_2 \rightarrow 6 \text{CO}_2 + 12 \text{H}_2\text{O} + \text{energy}\) 
      (sugar) (oxygen) (carbon) (water)
16. List plant nutrients: (3 points)
   a. Macronutrients ___________________________________________________________
   b. Micronutrients ___________________________________________________________

III. MULTIPLE CHOICE (2 Points Each)

1. Which of the following is the correct nomenclature for “Honey Crisp” apple?
   a. *Malus domestica* cv. ‘Honey Crisp’
   b. *Malus domestica* ‘Honey Crisp’
   c. *Malus domestica* cv. *Honey Crisp*
   d. *Malus domestica* Honey Crisp

2. The main reason why a clonal cultivar is propagated by asexual means is to utilize genetic variation among the propagated plant.
   a. True
   b. False

3. Which of the following crops would grow well when soil pH is between 4.0 to 5.0?
   a. Sugarbeet
   b. Blueberry
   c. Watermelon
   d. Geranium

4. The stone cells found in peach or apricot seeds are usually:
   a. parenchyma cells.
   b. collenchyma cells.
   c. meristematic cells.
   d. sclerenchyma cells.

5. Which of the following cytoplasmic components usually stores excess salts, sugar, and starch?
   a. Nucleus
   b. Mitochondria
   c. Vacuole
   d. Chloroplast

6. The water conducting tissue of the vascular system is the phloem.
   a. True
   b. False
7. The stomata are generally found on the abaxial side of the leaf.  
The spongy mesophyll cells are found on the adaxial side of the leaf tissue
   a. Both statements are true.
   b. The first statement is true and the second statement is wrong.
   c. The first statement is wrong and the second statement is true.
   d. Both statements are wrong.

8. Which of the following is not a component of a pistil?
   a. Ovary
   b. Style
   c. Filament
   d. Stigma

9. The process of releasing water vapor through stomata on the leaf is called:
   a. translocation.
   b. transpiration.
   c. evaporation.
   d. catabolism.

10. The C-4 plants usually grow faster than the C-3 plants, because:
    a. photorespiration takes place in the C-4 plants but not in C-3 plants.
    b. the C-4 plants use carbon dioxide (CO₂) more efficiently during photosynthesis.
    c. the rate of transpiration is lower in C-4 plants than in C-3 plants.
    d. the Calvin cycle does not exist in C-4 plants.

**Bonus Question** (5 points)

Make a question of your own from subjects that you have studied but not covered in this exam and answer it correctly.

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**Honor Pledge:** Upon my honor I have neither given nor received aid in writing this examination.  
Signed ________________________________