

5. Define the following terms as they relate to variation in seed sources used for plant propagation:
 - a. Provenance
 - b. Ecotypes
 - c. Clines
6. Define the following terms used for seed development and plant growth.
 - a. Phase change
 - b. Vernalization
 - c. Polyembryony
 - d. Recalcitrancy
7. Discuss the characteristics of three different types of seeds used in horticulture with examples:
 - a. Type 1 seed
 - b. Type 2 seed
 - c. Type 3 seed
8. Contrast the different between dormancy and quiescence in reference to seed germination.

II. SHORT ANSWERS/MATCHING (*various points*)

1. If a cross was made between two different parental lines ($P_1=AABB$, $P_2=aabb$), the resulting F_1 hybrid would have a genotype of _____, which is highly (____ homozygous, ____ heterozygous). (Check one) (*3 points*)

2. What is the difference between a clone and a pure line? (3 points)

3. Contrast variety vs. "cultivar." (3 points)

4. The basic genomic number (x) of chromosomes in potato is 12, and the cultivated potato is a tetraploid. Indicate the number of chromosomes contained per cell for different parts of the cultivated potato: (3 points)

a. Tuber _____ b. Leaf tissue _____ c. Pollen _____
d. Seed endosperm _____ e. zygotic embryo _____

5. Match the following parts of the ovary with the names of fruit tissues which they will eventually develop into: (4 points)

_____ Pericarp	a. Seed coat
_____ Zygote	b. Seed endosperm
_____ Funiculus	c. Fruit
_____ Integuments	d. Hilum
_____ Ovule	e. Embryo
_____ Endosperm	f. Seed

6. Match each of the following types of apomixes with a correct definition: (3 points)

a. Adventitious apomixis	b. Recurrent apomixis
c. Non-recurrent apomixis	c. Vegetative apomixis

_____ Embryos developed from egg mother cells without meiosis
_____ Embryos formed from nucellar cells
_____ Bulbils formed on flower heads (as in onion)
_____ Embryos developed from egg nucleus without fertilization

7. Define 'somatoplastic sterility' and explain how it occurs? (3 points)

8. What is "vivipary" and how does it occur? (3 points)

9. Cotyledon leaves are buried in soil during (_____ hypogeous, _____ epigeous) germination. (Check one) (2 points)

10. Three major components of a seed are: a) _____, b) _____, c) _____ (3 points).

11. Physiological (embryo) dormancy can be eliminated by (_____ scarification, _____ stratification). (Check one) (2 points)

12. Reasons why the coastal lines of northern California are popular for growing horticultural crops for seed production: (3 points)

13. Match the following types of seed dormancy with correct definitions: (3 points)

- | | |
|--------------------|---|
| _____ Paradormancy | a. dormancy caused by unsuitable environment |
| _____ Ecodormancy | b. dormancy caused by internal physiological factors |
| _____ Endodormancy | c. dormancy caused by physical or biological factors externally imposed |

14. Abscisic acid (ABA) is a germination (_____ promoter, _____ inhibitor) in most seeds. (Check one) (2 points)

III. MULTIPLE CHOICE/TRUE AND FALSE (2 points each)

1. Apomictic seeds are:

- genetically identical to the maternal plant.
- always homozygous.
- developed from zygotic embryos.
- polyploids.

2. Which of the following is a correct nomenclature for “Dakota Pearl” potato?

- Solanum tuberosum* cv. “Dakota Pearl”
- Solanum tuberosum* “Dakota Pearl”
- Solanum tuberosum* cv. ‘Dakota Pearl’
- Solanum tuberosum* ‘Dakota Pearl’

3. Which of the following soil amendments has the highest cation exchange capacity (CEC)?

- Perlite
- Peat
- Sand
- Rockwool

4. Recalcitrant seeds lose germinability when dried.

- True
- False

5. Polyembryony is likely to be found in:

- citrus crops like oranges.
- corn.
- lilies.
- gymnosperms like pines .

6. A species that produces female and perfect flowers on the same plant is:
- dioecious
 - monoecious
 - andromonoecious
 - Gynomonoecious
7. Which of the following plants would have the largest number of cotyledons on the seedling?
- Monocot plants like lily and wheat
 - Dicot plants like pea and tomato
 - Gymnosperms like pine and cedar
 - Plants of Liliaceae
8. Which of the following plant growth regulators is most effective in eliminating seed dormancy in general?
- Ethephon (ethylene-releasing)
 - Cytokinin (BA, Zeatin, or Kin)
 - Abscissic Acid (ABA)
 - Gibberellin (GA_3)
9. Aeration of germinating seeds is needed for:
- photosynthesis.
 - respiration.
 - transpiration.
 - dormancy breaking.
10. Lettuce and onion seeds typically require a cool temperature for good germination.
- True
 - False

BONUS QUESTION (3 points)

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

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

