

The number of points (out of a total of 150) that each question is worth is indicated in parentheses. For multiple choice questions, provide the BEST answer. Answer essay and short answer questions thoroughly but concisely; extraneous information may be counted against you. Also, if you are asked to list, for example, three items, listing more than three items may be counted against you. Good luck!

1. (3) Your name: \_\_\_\_\_
2. (3) An aboveground stem capable of vegetative reproduction is a
  - a. rhizome
  - b. stolon
  - c. corm
  - d. wart
3. (3) r-selected plants
  - a. have long life spans
  - b. have high allocations to vegetative growth
  - c. are adapted to stable environments
  - d. have rapid growth rates
4. (3) A self-pollinated species is expected to have
  - a. high variability within populations and high variability among populations
  - b. high variability within populations and low variability among populations
  - c. low variability within populations and high variability among populations
  - d. low variability within populations and low variability among populations
5. (3) Quantitative herbicide resistance
  - a. is controlled by a single gene
  - b. confers a high level of resistance
  - c. is documented in numerous biotypes
  - d. is strongly influenced by the environment
6. (3) Defined from a biological perspective, weeds are
  - a. any plant growing where they are not wanted
  - b. plants adapted to unstable environments
  - c. plants that are competitive, persistent, and widely adapted
  - d. plants that are parasitic or allelopathic
7. (3) What statement is true regarding the relationship of crop yield and weed density.
  - a. yield decreases linearly with increasing weed density
  - b. yield decreases drastically even with extremely low weed densities
  - c. yield typically does not go to zero even with very high weed densities
  - d. yield decreases in a step-wise fashion as weed density increases

8. (3) Allelopathy accounts for about what percentage of crop yield loss in a typical Illinois cornfield?
  - a. 5%
  - b. 10%
  - c. 25%
  - d. we don't know for sure
  
9. (3) Herbicides comprise about what percentage of the U.S. agrochemical market?
  - a. 10%
  - b. 20%
  - c. 33.3%
  - d. >50%
  
10. (3) Two seeds within the fruit of common cocklebur that have different dormancy is an example of
  - a. developmental plasticity
  - b. somatic polymorphism
  - c. genetic diversity
  - d. apomixis
  
11. (3) Apomixis is
  - a. asexual seed production
  - b. containing less than the base number of chromosomes
  - c. outcrossing without the use of specialized pollinators
  - d. dormancy mediated by an immature embryo
  
12. (3) Which of the following statements regarding parasitic weeds is true?
  - a. Parasitic weeds do not exist in the U.S.
  - b. Some parasitic weeds are absolutely dependent on their host for survival.
  - c. Parasitic weeds are easily controlled with proper management.
  - d. Parasitic weeds can not be controlled with herbicides.
  
13. (3) The niche concept suggests that
  - a. weeds will be strong competitors
  - b. weeds will be very persistent
  - c. plant species exhibit high genetic diversity among populations
  - d. plants are specialized
  
14. (3) According to the C, S, and R theory, C plants are adapted to environments characterized by
  - a. high stress and low disturbance
  - b. high stress and high disturbance
  - c. low stress and low disturbance
  - d. low stress and high disturbance
  
15. (3) A female waterhemp plant growing in non-competitive conditions might produce
  - a. 1000 seeds
  - b. 10,000 seeds
  - c. 50,000 seeds
  - d. 100,000 seeds

16. (3) Which of the following species uses forceful dehiscence to disperse its seeds
- common cocklebur
  - common yellow woodsorrel
  - purple loosestrife
  - field pennycress
17. (3) According to Dr. Tranel (who is usually right, by the way), the most important weediness trait is
- having a general purpose genotype
  - seed dormancy
  - high seed production
  - having a short regeneration time
18. (3) The critical weed free period
- is determined from replacement series experiments
  - in soybean, lasts only a relatively short period of time
  - in corn, typically lasts until pollination
  - can occur only between planting and seed set
19. (3) Pr
- promotes germination
  - absorbs far-red light
  - has an absorption peak that overlaps with that of chlorophyll
  - is less abundant in a seed under a plant canopy compared to in a seed under full sunlight
20. (3) Chemical weed control dates back to
- the mid 1900s
  - the mid 1980s
  - the early 1800s
  - hundreds of years ago
21. (3) This species can reproduce from its roots; and much of this species' success as a weed is attributed to the ability of its roots to penetrate deep into the soil.
- quackgrass
  - wild garlic
  - multiflora rose
  - field bindweed
22. (3) Approximately what percentage of all flowering plants are weeds?
- 50%
  - 25%
  - 10%
  - 1%
23. (3) Which of the following statements regarding the soil seed bank is FALSE?
- reduction of the soil seed bank can occur very quickly with proper management
  - it is the product of seed dormancy
  - it can build up very quickly
  - the number of seeds in the soil seed bank varies substantially among different habitats

24. (3) A seed that does not germinate when placed in a favorable environment (adequate moisture and temperature) immediately after release from its parent has this type of dormancy
- induced
  - innate
  - secondary
  - enforced
25. (3) Which of the following species would you expect to have greater genetic diversity?
- a self-pollinated, introduced species
  - a vegetatively reproduced indigenous species
  - an indigenous ruderal species
  - an introduced ruderal species
26. (3) Which of the following is NOT an allelochemical?
- juglone
  - sorgoleone
  - ampoleone
  - DIMBOA
27. (3) This invasive weed, listed in the article, Alien Invasion, is especially problematic in wetlands.
- leafy spurge
  - kudzu
  - spotted knapweed
  - purple loosestrife
28. (3) Barberry serving as an alternate host for a wheat disease is an example of which type of plant interference?
- indirect effect
  - allelopathy
  - parasitism
  - competition
29. (3) Abscisic acid
- is a plant hormone that promotes dormancy
  - is a plant hormone that promotes germination
  - is a plant pigment that promotes dormancy
  - is a plant pigment that promotes plasticity
30. (3) With an additive experiment
- the overall plant density remains constant
  - the critical weed free period can be determined
  - allelopathic interactions can be identified
  - the density of one species is kept constant

31. (3) Which of the following does NOT account for the relatively infrequent use of economic treatment thresholds for weeds
- farmers like to see weed-free fields
  - herbicides are generally only effective if applied before thresholds can be determined
  - the large role of the environment makes calculations of economic treatment thresholds imprecise
  - allowing a few weeds to produce seed may create problems for future years
32. (3) Tropical spiderwort is an example of a weed species that has become more prominent due to
- the widespread use of 2,4-D
  - wide adoption of Roundup-Ready crops
  - increased use of fertilizers
  - fewer crop rotations with perennial forage crops
33. (3) Functional allelopathy
- designates allelopathy in agronomic crops
  - designates allelopathy in natural ecosystems
  - involves allelochemicals that are volatile
  - is mediated by microbial activity
34. (3) What is the estimated annual cost of weeds in the U.S.?
- \$10 million
  - \$20 billion
  - \$500 thousand
  - \$25 trillion
35. (3) A plant that uses resources efficiently
- will compete well under competitive conditions
  - will create highly competitive conditions
  - is unlikely to be a weed
  - is likely to exhibit allelopathy
36. (3) Discovery of the ALS-inhibiting herbicides in the early 1980s was significant because these herbicides
- have very low use rates
  - do not select for resistant weeds
  - were the first to select for resistant weeds
  - have broad spectrum weed control
37. (3) Which of the following statements is true?
- Biennials require stratification to flower.
  - Summer annuals germinate in the fall and flower in the summer.
  - Winter annuals flower in the spring.
  - Simple perennials are capable of vegetative reproduction.
38. (8) List four parasitic weeds discussed in class.

39. (4) The growth morphology of biennials during their first year of growth is called a \_\_\_\_\_.
40. (4) A species with separate male and female plants is said to be \_\_\_\_\_.
41. (4) That different accessions of common cocklebur exhibit different levels of competition with soybean is an example of \_\_\_\_\_.
42. (4) Give an example of an agroecotype that was presented in class (just list the species).  
\_\_\_\_\_
43. (4) The ability of weeds to alter flowering time in response to the environment is called \_\_\_\_\_.
44. (6) List two different terms that were used in class to describe genetically distinct individuals of a species. \_\_\_\_\_ and \_\_\_\_\_
45. (8) Explain the physiological basis for why  $C_4$  photosynthesis is advantageous to plants. (We all know it allows plant to be more competitive, especially under conditions of high light and high temperature; what is the physiology behind this?)