

Sample Exam Questions Ecology

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Introduced or exotic species
 - A) often fail to colonize the new area.
 - B) may become common enough to become pests.
 - C) can disrupt the balance of the natural species with which they become associated.
 - D) B and C only
 - E) A, B, and C are all correct.

- 2) Which of the following is responsible for the summer and winter stratification of lakes?
 - A) Water is densest at 4°C.
 - B) Oxygen is most abundant in deeper waters.
 - C) Winter ice may carry over until spring thaw.
 - D) Stratification is caused by a thermocline.
 - E) Stratification always follows the fall and spring turnovers.

- 3) Which of the following statements best describes the interaction between fire and ecosystems?
 - A) The chance of fire in a given ecosystem is highly predictable over the short term.
 - B) Many kinds of plants and plant communities have adapted to frequent fires.
 - C) The prevention of forest fires has allowed more productive and stable plant communities to develop.
 - D) Chaparral communities have evolved to the extent that they rarely burn.
 - E) Fire is unnatural in ecosystems and should be prevented.

- 4) You are observing a population of lizards when you notice that the number of adults has increased and is higher than previously observed. A likely explanation for such an observation would include
 - A) reduction in death rate.
 - B) increased immigration.
 - C) increased emigration.
 - D) decreased emigration.
 - E) both B and D

5) Imagine that you are managing a large ranch. You know from historical accounts that wild sheep used to live there, but they have been exterminated. You decide to reintroduce them. After doing some research to determine what might be an appropriate founding population, you introduce them. You then watch the population increase, and graph the number of individuals (on the vertical axis) against the number of generations (on the horizontal axis). If you graph the change over a short time period it will

- A) be a diagonal line, getting higher with each generation.
- B) look like an "S," increasing with each generation.
- C) look like an upside-down "U."
- D) look like a "J," increasing with each generation.
- E) look like none of the above.

6) In the exponential equation $dN/dt = rN$, r is a measure of the population's intrinsic rate of increase. It is determined by which of the following?

- A) birth rate
- B) death rate
- C) density
- D) A and B only
- E) A, B, and C

7) Two barnacles, *Balanus* and *Chthamalus*, can both survive on the lower rocks just above the low-tide line on the Scottish coast, but only *Balanus* actually does so, with *Chthamalus* adopting a higher zone. Which of the following best accounts for this niche separation?

- A) competitive exclusion
- B) predation of *Chthamalus* by *Balanus*
- C) cooperative displacement
- D) primary succession
- E) mutualism

8) Resource partitioning would be most likely to occur between

- A) sympatric populations of a predator and its prey.
- B) sympatric populations of species with similar ecological niches.
- C) sympatric populations of a flowering plant and its specialized insect pollinator.
- D) allopatric populations of the same animal species.
- E) allopatric populations of species with similar ecological niches.

9) Elephants are not the most common species in African grasslands. The grasslands contain scattered woody plants, but they are kept in check by the uprooting activities of the elephants. Take away the elephants, and the grasslands convert to forests or to shrublands. The newly growing forests support fewer species than the previous grasslands. Elephants can be defined as what type of species in this community?

- A) redundant
- B) dominant
- C) keystone
- D) dominant and keystone
- E) none of the above

- 10) Which of the following statements about succession is *correct*?
- A) Secondary succession occurs where no soil exists.
 - B) Primary succession occurs in areas where soil remains after a disturbance.
 - C) Secondary succession can occur where a disturbance has left soil intact.
 - D) Some cases of succession involve facilitation, a phenomenon in which local species inhibit the growth of newcomers.
 - E) Through successional dynamics, most communities will eventually become more stable through time.
- 11) What is the fundamental difference between matter and energy?
- A) Matter is cycled through ecosystems; energy is not.
 - B) Energy is cycled through ecosystems; matter is not.
 - C) Energy can be converted into matter; matter cannot be converted into energy.
 - D) Matter can be converted into energy; energy cannot be converted into matter.
 - E) Matter is used in ecosystems; energy is not
- 12) The total biomass of photosynthetic autotrophs present in an ecosystem is known as
- A) gross primary productivity.
 - B) standing crop.
 - C) net primary productivity.
 - D) secondary productivity.
 - E) trophic efficiency.
- 13) How does phosphorus normally enter the atmosphere?
- A) respiration
 - B) photosynthesis
 - C) rock weathering
 - D) geological uplifting (subduction and vulcanism)
 - E) It does not enter the atmosphere in biologically significant amounts.
- 14) Which of the following statements is (are) true?
- A) An ecosystem's trophic structure determines the rate at which energy cycles within the system.
 - B) At any point in time, it is impossible for consumers to outnumber producers in an ecosystem.
 - C) Chemoautotrophic prokaryotes near deep-sea vents are primary producers.
 - D) There has been a well-documented increase in atmospheric carbon dioxide over the past several decades.
 - E) both C and D
- 15) If the flow of energy in an arctic ecosystem goes through a simple food chain from seaweeds to fish to seals to polar bears, then which of the following is true?
- A) Polar bears can provide more food for people than seals can.
 - B) The total energy content of the seaweeds is lower than that of the seals.
 - C) Polar bear meat probably contains the highest concentrations of fat-soluble toxins.
 - D) Seals are more numerous than fish.
 - E) The carnivores can provide more food for people than the herbivores can.

ANSWERS

1) E

2) A

3) B

4) B

5) D

6) D

7) A

8) B

9) C

10) C

11) A

12) B

13) E

14) E

15) C