

1. Base your answer to the following question on the information below and on your knowledge of biology.

An experiment was carried out to answer the question "Does the pH of water affect the growth of radish plants?" Two groups of ten radish plants were set up. One group was watered with water having a pH of 3.0, and the other group was watered with water having a pH of 7.0. Both groups of plants received the same amount and intensity of light, the same amount of water, and they were grown in the same type of soil. The heights of the radish plants were measured every 2 days for a period of 2 weeks.

Which activity might help to increase the validity of this experiment?

- A) **repeating the experiment several times**
 B) using two different types of radish seeds in each group
 C) using the same pH for both groups of plants
 D) placing one set of plants in sunlight and one in darkness

2. Which statement about the use of independent variables in controlled experiments is correct?

- A) A different independent variable must be used each time an experiment is repeated.
 B) The independent variables must involve time.
 C) **Only one independent variable is used for each experiment.**
 D) The independent variables state the problem being tested.

3. The number of white-tailed deer in certain areas of Long Island, NY has increased significantly. Homeowners and farmers have put up tall fencing to protect their gardens and crops from the deer. One reason why the white-tailed-deer might have increased significantly in certain areas of Long Island is

- A) **the lack of natural predators**
 B) an increase in deer pathogens
 C) a shortage of biotic resources needed by the deer
 D) that carrying capacity has no effect on deer populations

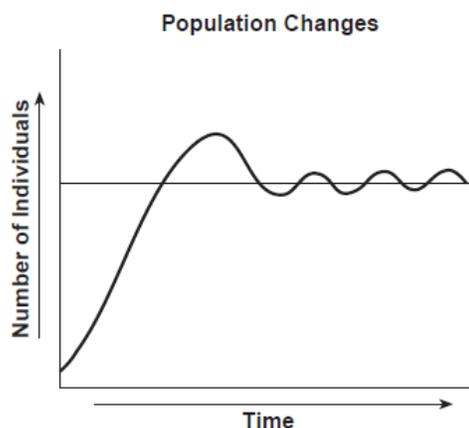
4. In a freshwater pond community, a carp eats decaying material from around the bases of underwater plants, while a snail scrapes algae from the leaves and stems of the same plants. They can survive at the same time because they occupy

- A) the same niche, but different habitats
 B) **the same habitat, but different niches**
 C) the same habitat and the same niche
 D) different habitats and niches

5. Two closely related species of birds live in the same tree. Species *A* feeds on ants and termites, while species *B* feeds on caterpillars. The two species coexist successfully because

- A) **each occupies a different niche**
 B) they interbreed
 C) they use different methods of reproduction
 D) birds compete for food

6. The graph below represents some changes in the number of individuals in a particular population in a stable ecosystem over a period of time.



Which statement best describes the trend shown in this graph?

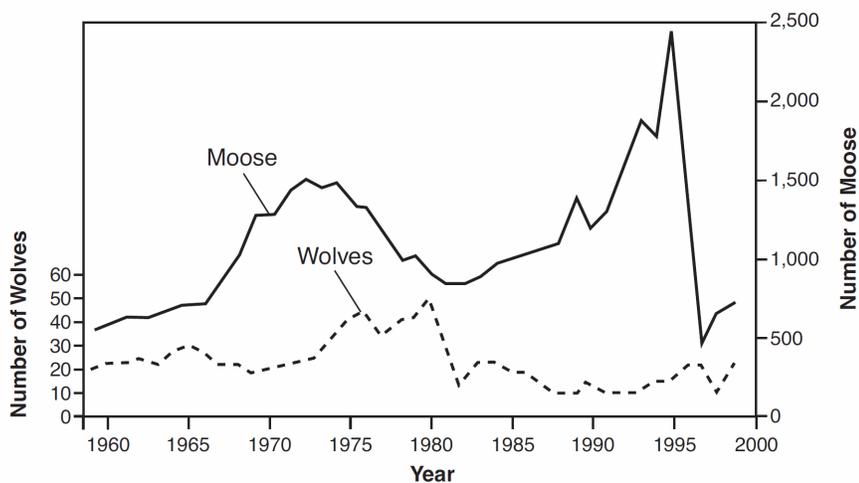
- A) Ecosystem conditions will eventually cause a population to become extinct.
 B) **In a stable ecosystem, the number of individuals in a population is usually maintained within a certain range.**
 C) The interactions between a population and various factors in an environment are always predictable.
 D) In order for any ecosystem to maintain a balance, populations must be reduced to half their original number.
7. Which group contains terms that are *all* directly associated with one of the organisms shown in the diagram below?



- A) herbivore, prey, autotroph, host
 B) predator, scavenger, decomposer, consumer
 C) **carnivore, predator, heterotroph, multicellular**
 D) producer, parasite, fungus, fish

8. Base your answer to the following question on the diagram below and on your knowledge of biology.

Wolf and Moose Populations, 1960 to 1999



Source: Ecological Studies of Wolves on Isle Royale, Rolf O. Peterson, School of Forestry and Wood Products, Michigan Technological University

An observable trend in the wolf and moose data between 1980 and 1995 is

- A) as the wolf population decreases, the moose population increases
- B) as the wolf population decreases, the moose population decreases
- C) the numbers of wolves and moose are relatively constant
- D) the numbers of wolves and moose appear to be unrelated

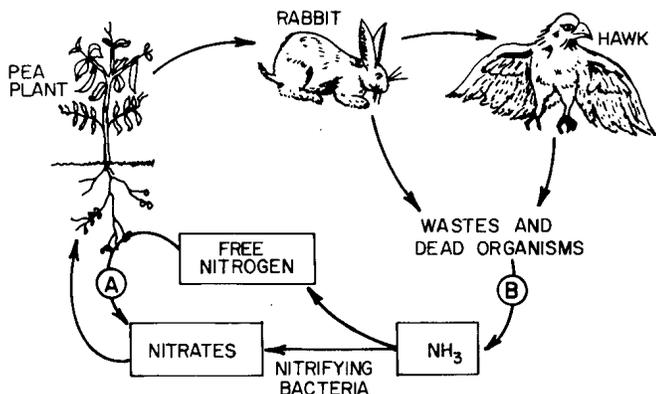
9. Many biotic factors affect individuals in a population. An example of an organism being directly affected by a biotic factor is

- A) a squirrel cannot find a mate
- B) a flood washes away a maple tree
- C) a plant is in a dark room
- D) a chipmunk finds a rock pile to use for a home

10. A finite resource in the environment that keeps a population from steadily increasing is known as

- A) dynamic equilibrium
- B) a limiting factor
- C) a reproductive enzyme
- D) ecological succession

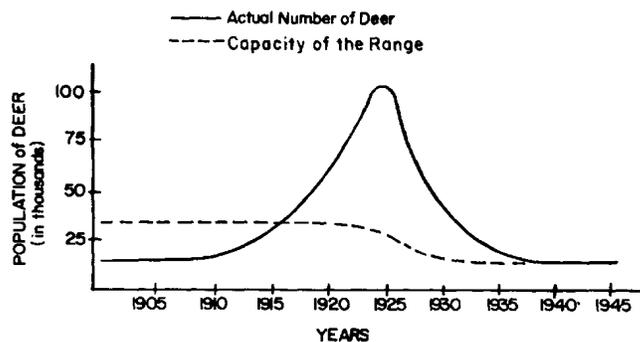
11. Base your answer to the following question on the diagram below of the nitrogen cycle and on your knowledge of biology.



An organism in the diagram that occupies the niche of a secondary consumer is the

- A) nitrifying bacteria
- B) pea plant
- C) rabbit
- D) hawk

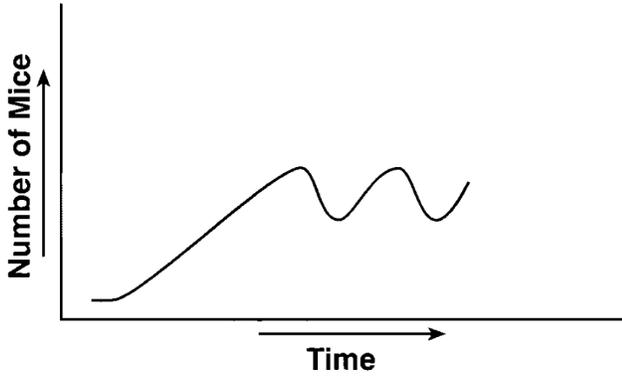
12. Base your answer to the following question on the graph below and on your knowledge of biology. The graph represents the relationship between the capacity of the range (number of deer that could be supported by the range), the number of deer actually living on the range, and time.



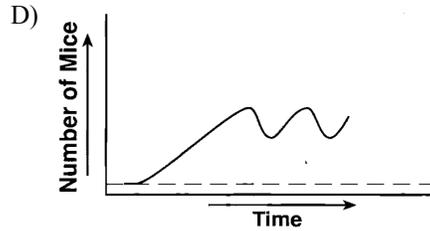
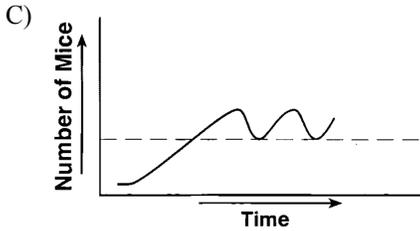
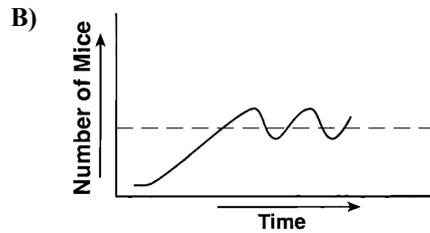
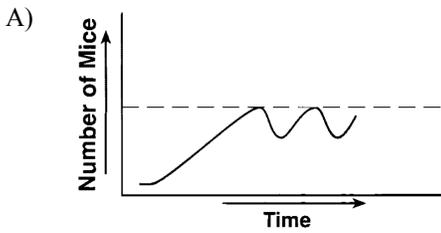
What is the most likely reason why the capacity of the range to support deer decreased between 1920 and 1930?

- A) The deer population became too large.
- B) The number of predators increased between 1915 and 1925.
- C) The deer population decreased in 1919.
- D) An unusually cold winter occurred in 1918.

13. The graph below shows the growth of a field mouse population in an ecosystem over time.



The dashed line indicating the carrying capacity for the mouse population is correctly shown on which graph?



14. The pyramid below illustrates some feeding relationships in alpine meadows of Yellowstone National Park.



Which statement is best supported by the information shown in the pyramid?

- A) Chipmunks and insects can occupy the same niche.
- B) As the number of bears in this community increases, the number of chipmunks will increase.
- C) Insects are classified as omnivores in alpine meadow communities.
- D) **Biomass decreases as energy is transferred from one level to another.**

15. After a rabbit population reaches the carrying capacity of its habitat, what will most likely happen to the population of rabbits?

- A) decrease, only
- B) increase, only
- C) **alternately increase and decrease**
- D) remain unchanged

Answer Key

Quiz # 5

1. **A**
 2. **C**
 3. **A**
 4. **B**
 5. **A**
 6. **B**
 7. **C**
 8. **A**
 9. **A**
 10. **B**
 11. **D**
 12. **A**
 13. **B**
 14. **D**
 15. **C**
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