Population & Communities Assessment

Name: _____ **Date:** _____

1. Which example shows a relationship between a living thing and a nonliving thing?

   A. An insect is food for a salmon.

   B. Water carries a rock downstream.

   C. A tree removes a gas from the air.

   D. A flower makes food for a butterfly.

2. Which of the following does *not* give an example of how sparrows use resources in their environment to survive?

   A. Sparrows breathe air.

   B. Sparrows drink water.

   C. Sparrows use the sun for food.

   D. Sparrows use plants for shelter.

3. Salt concentration, water temperature, plankton, and the whale shark might all be used in a description of an ocean

   A. climate. B. food web.

   C. ecosystem. D. population.

4. What is a primary role of decomposers in an ecosystem?

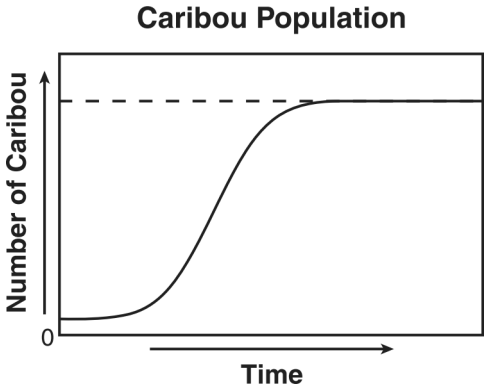
   A. They eliminate matter by taking nitrogen from the ecosystem.

   B. They eliminate matter by taking phosphorus from the ecosystem.

   C. They cycle matter by returning carbon and other matter to the ecosystem.

   D. They cycle matter by returning oxygen and other matter to the ecosystem.

5. The graph below shows changes in a caribou population over time.



   Based on the graph, which of the following is a possible explanation for the stabilization of the caribou population?

   A. an equal number of deaths and births

   B. an unequal number of deaths and births

   C. an equal number of immigrants and births

   D. an unequal number of immigrants and deaths

6. What role do fungi and bacteria play in an ecosystem?

   A. Produce food

   B. Remove dangerous pests

   C. Maintain the temperature of the soil

   D. Break down dead plants and animals

7. After a volcanic eruption has covered an area with lava, which of the following is the *most* likely order of succession in the repopulation of the area?

   A. lichens → grasses → shrubs → trees

   B. mosses → grasses → lichens → trees

   C. grasses → trees → mosses → lichens

   D. shrubs → grasses → trees → lichens

8. Before it was banned, the insecticide DDT was used to combat an organism called the red mite. An unexpected result of the use of DDT was that the population of the red mite increased rather than decreased, while the population of insect predators of the red mite decreased. What can be inferred from this situation?

   A. Environmental changes that affect one population can affect other populations.

   B. The red mite and its insect predators were all competing for the same resources.

   C. The red mites were immune to the effects of insecticides.

   D. Using insecticides is a reliable way to eliminate all insect predators.

9. El Niño is a short-term climatic change that causes ocean waters to remain warm when they should normally be cool. The warmer temperatures disrupt food webs and alter weather patterns. Which occurrence would most likely result from these changes?

   A. Some species would become extinct, and other species would evolve to take their place.

   B. Some populations in affected areas would be reduced, while other populations would increase temporarily.

   C. The flow of energy through the ecosystem would remain unchanged.

   D. The genes of individual organisms would mutate to adapt to the new environmental conditions.

10. In a certain ecosystem, rattlesnakes are predators of prairie dogs. If the prairie dog population started to increase, how would the ecosystem most likely regain stability?

    A. The rattlesnake population would start to decrease.

    B. The rattlesnake population would start to increase.

    C. The prairie dog population would increase rapidly.

    D. The prairie dog population would begin to prey on the rattlesnakes.

11. Areas with many different niches will most likely have

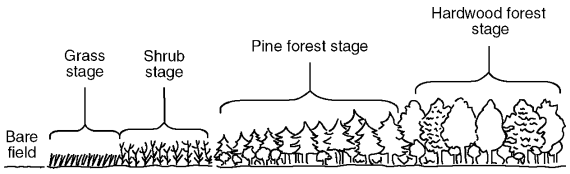
    A. large numbers of organisms that will become extinct

    B. no organisms that will become extinct

    C. little diversity among the organisms

    D. great diversity among the organisms

12. Which of the stages in the diagram below consists of plant species that modify the environment, eventually making it more suitable for another community?



    A. grass stage, only

    B. grass, shrub, and pine forest stages

    C. shrub, pine forest, and hardwood forest stages

    D. hardwood forest stage, only

13. Some small fish attach themselves to the body of a shark without harming it and feed upon its left over food. This relationship between the shark and the fish is an example of

    A. commensalism B. mutualism

    C. competition D. parasitism

14. If several species of carnivores are removed from an ecosystem, the most likely effect on the ecosystem will be

    A. an increase in the kinds of autotrophs

    B. a decrease in the number of abiotic factors

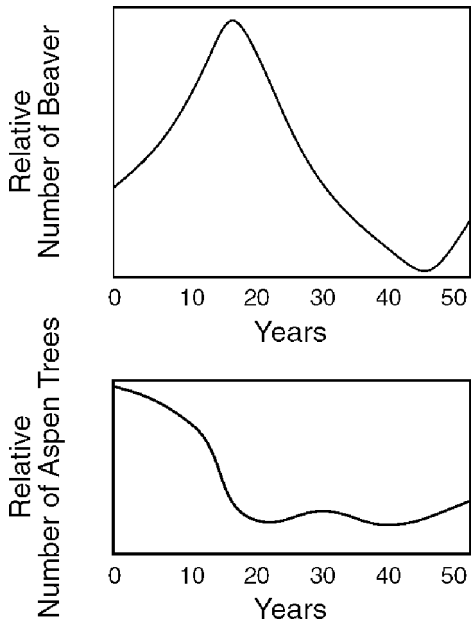
    C. a decrease in stability among populations

    D. an increase in the rate of succession

15. The dense needles of Douglas fir trees can prevent most light from reaching the forest floor. This situation would have the most immediate effect on

A. producers
B. carnivores
C. herbivores
D. decomposers

16. Base your answer(s) to the following question(s) on the graphs below, which show changes in the number of aspen trees and the beaver population in an area over a 50-year period.



State the relationship that exists between the number of aspen trees and the beaver populations in this region during the first 15 years.

17. In New York State, bluebirds and sparrows inhabit nearly the same ecological niche. In many areas, bluebirds are being replaced by the sparrows as a result of

A. symbiosis
B. competition
C. mutualism
D. equilibrium

18. Competition between two species occurs when

A. mold grows on a tree that has fallen in the forest
B. chipmunks and squirrels eat sunflower seeds in a garden
C. a crow feeds on the remains of a rabbit killed on the road
D. a lion stalks, kills, and eats an antelope

19. What do scientists mean when they refer to a *population*?

A. all the organisms in an ecosystem
B. all the species that share similar anatomical features
C. all the animals that acquire resources through similar methods
D. all the interbreeding members of a certain species in an ecosystem

20. Which relationship is mutualistic?

A. an insect that lives and feeds on the body of an alligator
B. an ant that lives on a plant and defends the plant from other insects
C. a bird that migrates to follow the movements of the butterflies that it eats
D. a deer that eats one kind of plant, which allows another kind of plant to grow in its place

21. Which of the following is *always* a result of immigration into a population?

A. New individuals are added to the population.
B. Some individuals are forced to leave the population.
C. The survival rate of the individuals in the population increases.
D. The genetic diversity among the individuals in the population decreases.

22. Ticks carry bacteria that cause Lyme disease. Ticks do not get Lyme disease, but they can transfer the bacteria to humans, who can get the disease.

Which of the following statements *best* describes the relationships among the bacteria, the ticks, and the humans?

A. The relationship between the bacteria and the ticks is competition, and the relationship between the ticks and the humans is predation.

B. The relationship between the bacteria and the ticks is competition, and the relationship between the ticks and the humans is parasitism.

C. The relationship between the bacteria and the ticks is commensalism, and the relationship between the ticks and the humans is parasitism.

D. The relationship between the bacteria and the ticks is commensalism, and the relationship between the ticks and the humans is predation.

23. Base your answer(s) to the following question(s) on the information below and on your knowledge of biology

Signs of a Changing Planet

While the changing climate endangers some species, a little global warming suits many shallow-water squid and octopuses just fine. Slightly higher ocean temperatures have been shown to boost the growth of these cephalopods, whose digestive enzymes speed up when warm. The tentacled creatures are also quick to colonize new territory as conditions become more favorable. Humboldt squid, which usually range from Southern California to South America, have been spotted as far north as Alaska. Deep-sea squid may not, however, adapt as readily.

Sierra Magazine, March/April 2005

Although warming of the ocean may favor the migration of these squid into new territory, there may be biotic factors that make it difficult for these squid to live there. Identify *one* of these biotic factors, and explain why this factor would make it difficult for these squid to live in the new territory.

24. Base your answer(s) to the following question(s) on the article which was written in response to an article entitled "Let all predators become extinct."

Predators Contribute to a Stable Ecosystem

In nature, energy flows in only one direction. Transfer of energy must occur in an ecosystem because all life needs energy to live, and only certain organisms can change solar energy into chemi

Producers are eaten by consumers that are, in turn, e Stable ecosystems must contain predators to help control the populations of consumers.

Since ecosystems contain many predators, exterminating predators would require a massive effort that would wipe out predatory species from barnacles to blue whales. Without the population control provided by predators, some organisms would soon overpopulate.

Explain why an ecosystem with a variety of predator species might be more stable over a long period of time than an ecosystem with only one predator species.

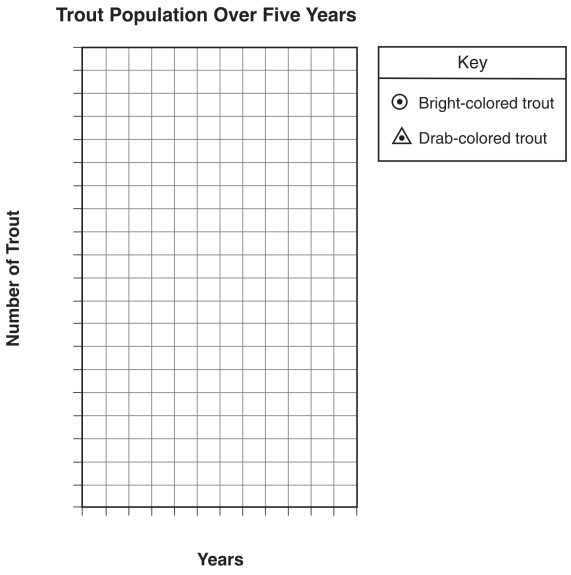
25. Base your answer(s) to the following question(s) on the information and data table below and on your knowledge of biology.

An investigation was carried out over a five-year period to measure the effect of color on the survival of trout in a stream. The stream contained many brightly colored stones and food was plentiful. At the start of the investigation (year 0), 100 bright-colored trout and 100 drab-colored trout were placed into a section of the stream that had been blocked with netting. Investigators monitored the trout populations for five years and recorded the water condition each time a count was done. The data collected are shown in the table below.

Trout Population Over Five Years

Year	Bright-Colored Trout	Drab-Colored Trout	Condition of Water
0	100	100	clear
1	64	36	clear
2	86	25	clear
3	25	77	cloudy
4	14	86	cloudy
5	90	9	clear

Directions: Using the information in the data table, construct a line graph on the grid provided, following the directions below.



Explain how trout survival is related to the color of trout and the environmental condition of the stream.