1. Which statement concerning an ecosystem is correct?
   (1) It can exist with or without a constant source of energy input.
   (2) It must contain consumers but can exist without producers.
   (3) It involves interactions between biotic and abiotic factors.
   (4) It can exist on land, but it cannot exist in lakes, rivers, or oceans.

2. A pond ecosystem is represented in the diagram below.

   Energy for this ecosystem originally comes from
   (1) water   (3) sunlight
   (2) consumers   (4) plants

3. An environment can support only as many organisms as the available energy, minerals, and oxygen will allow. Which term is best described by this statement?
   (1) biological feedback   (3) homeostatic control
   (2) carrying capacity   (4) biological diversity

4. The reason that organisms cannot produce populations of unlimited size is that
   (1) the resources of Earth are finite
   (2) there is no carrying capacity on Earth
   (3) species rarely compete with one another
   (4) interactions between organisms are unchanging

5. What impact do the amounts of available energy, water, and oxygen have on an ecosystem?
   (1) They act as limiting factors.
   (2) They are used as nutrients.
   (3) They recycle the residue of dead organisms.
   (4) They control environmental temperature.

6. Knowing the type of food consumed by an organism helps to identify the role of the organism in the community. This role is known as its
   (1) nesting site   (3) biomass
   (2) territorial range   (4) niche

7. A population of chipmunks migrated to an environment where they had little competition. Their population quickly increased but eventually stabilized as shown in the graph.

   Which statement best explains why the population stabilized?
   (1) Interbreeding between members of the population increased the mutation rate.
   (2) The population size became limited due to factors such as availability of food.
   (3) An increase in the chipmunk population caused an increase in the producer population.
   (4) A predator species came to the area and occupied the same niche as the chipmunks.

8. Which sequence shows increasing complexity of levels of ecological organization?
   (1) biosphere, ecosystem, community
   (2) biosphere, community, ecosystem
   (3) community, ecosystem, biosphere
   (4) ecosystem, biosphere, community

9. Great horned owls and red-tailed hawks have similar requirements for food, space, and nesting materials. What would most likely be the result of great horned owls and red-tailed hawks living in the same community?
   (1) ecological succession   (3) habitat destruction
   (2) competition   (4) parasitism

10. An ecosystem will most likely remain stable if
    (1) it has more predators than prey
    (2) it has a high level of biodiversity
    (3) biotic factors decrease
    (4) finite resources decrease

11. Cutting down a rain forest and planting agricultural crops, such as coffee plants, would most likely result in
    (1) a decrease in biodiversity
    (2) an increase in the amount of energy recycled
    (3) a decrease in erosion
    (4) an increase in the amount of photosynthesis
12. The graph below shows the number of birds in a population.

Which statement best explains section X of the graph?
1) Interbreeding between members of this population increased the mutation rate.
2) An increase in the bird population caused an increase in the producer population.
3) The population reached a state of dynamic equilibrium due to limiting factors.
4) Another species came to the area and provided food for the birds.

13. Many years ago, a volcanic eruption killed many plants and animals on an island. Today the island looks much as it did before the eruption. Which statement is the best possible explanation for this?
1) Altered ecosystems regain stability through the evolution of new plant species.
2) Destroyed environments can recover as a result of the process of ecological succession.
3) Geographic barriers prevent the migration of animals to island habitats.
4) Destroyed ecosystems always return to their original state.

14. Species of animals that obtain food by consuming only autotrophic organisms are usually classified as
1) herbivores
2) decomposers
3) scavengers
4) omnivores

15. 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?
1) The rattlesnake population would start to decrease.
2) The rattlesnake population would start to increase.
3) The prairie dog population would increase rapidly.
4) The prairie dog population would begin to prey on the rattlesnakes.

16. Imported animal species often disrupt an ecosystem because in their new environment, they will most likely
1) eliminate the genetic variation of the autotrophs
2) increase the number of mutations in the herbivores
3) have no natural enemies
4) be unable to produce offspring

17. Which ecological principle is best illustrated by the diagram below?
1) In an ecosystem, material is cycled among the organisms and their environment.
2) As a result of competition between two species, one species will be excluded from the niche.
3) Competition within a species results in natural selection.
4) An ecosystem requires a constant source of energy

18. Vultures, which are classified as scavengers, are an important part of an ecosystem because they
1) hunt herbivores, limiting their populations in an ecosystem
2) feed on dead animals, which aids in the recycling of environmental materials
3) cause the decay of dead organisms, which releases usable energy to herbivores and carnivores
4) are the first level in food webs and make energy available to all the other organisms in the web
19. Stage D in the diagram below is located on land that was once a bare field.

![Diagram of ecological succession stages]

The sequence of stages leading from bare field to stage D best illustrates the process known as
(1) replication (2) recycling (3) feedback (4) succession

20. An energy pyramid is represented below.

![Energy pyramid diagram]

How much energy would be available to the organisms in level C?
(1) all of the energy in level A, plus the energy in level B
(2) all of the energy in level A, minus the energy in level B
(3) a percentage of the energy contained in level B
(4) a percentage of the energy synthesized in level B and level D

21. Base your answer to the following question on the energy pyramid below and on your knowledge of biology.

![Energy pyramid diagram]

The greatest amount of available energy is transferred from level
(1) A to level B (2) A to level C (3) B to level A (4) D to level A
22. State one example of a predator-prey relationship found in the food web. Indicate which organism is the predator and which is the prey.

23. If the population of mice is reduced by disease, which change will most likely occur in the food web?
   (1) The cricket population will increase. (3) The grasses will decrease.
   (2) The snake population will increase. (4) The deer population will decrease.

24. What is the original source of energy for this food web?
   (1) chemical bonds in sugar molecules (3) the Sun
   (2) enzymatic reactions (4) chemical reactions of bacteria

25. Which organisms are not shown in this diagram but are essential to a balanced ecosystem?
   (1) heterotrophs (2) autotrophs (3) producers (4) decomposers
1. 3
2. 3
3. 2
4. 1
5. 1
6. 4
7. 2
8. 3
9. 2
10. 2
11. 1
12. 3
13. 2
14. 1
15. 2
16. 3
17. 1
18. 2
19. 4
20. 3
21. 1

22. Examples: Predator/Prey
   — lion/deer — lion/rabbit — hawk/mouse — mouse/cricket —
   frog/cricket

23. 1
24. 3
25. 4