Multiple choice: Circle the best answer.

1. You decide you no longer want your exotic pet frog. The best way to deal with your unwanted frog is to:
   a. leave it near a local pond
   b. return it to the pet store
   c. let it go free in your backyard
   d. all of the above are good options

2. Which statement best describes an important difference between plants and animals?
   a. Plants get food from the soil while animals get food by eating other organisms.
   b. Animals are alive but plants are not.
   c. Plants use carbon dioxide from the air and water to make their own food while animals get food by eating other organisms.
   d. Animals are made of cells but plants are not.

3. Which of the following is NOT an example of a producer?
   a. rose bush
   b. grasshopper
   c. apple tree
   d. wheat

4. In order to survive, most organisms have specific requirements related to:
   a. warmth
   b. space
   c. light
   d. all of the above

5. Scientifically, humans are named Homo sapiens. “Homo” is the:
   a. genus
   b. kingdom
   c. phylum
   d. species
6. The role of producers in an ecosystem is to:
   a. convert the sun’s energy into energy stored as food
   b. convert other organisms into energy
   c. eat other living organisms for energy
   d. break down dead and waste matter

7. You see a cat crouched behind a flowerpot, carefully and quietly looking at something on the other side. You think she is hunting a mouse. Your idea is known as:
   a. an experiment
   b. an observation
   c. an inference
   d. all of the above

8. Feeding relationships in ecosystems are best represented by:
   a. chains
   b. webs
   c. ribbons
   d. circles

Questions 9–11 refer to the following diagram:

```
  owl
 /    /
|     |
|     |
human

rabbit

|     |
|     |
grass
```

9. In this diagram, which of the following is a consumer?
   a. rabbit
   b. owl
   c. human
   d. all of the above

10. The original source of energy is the:
    a. grass
    b. human
    c. sun
    d. none of the above
11. What is missing from this diagram?
   a. a producer
   b. a decomposer
   c. both a and b
   d. none of the above

12. The word “ecosystem” refers to:
   a. the physical environment
   b. living organisms
   c. living organisms and the physical environment
   d. living organisms in the laboratory

13. Which of the following statements is TRUE?
   a. you can always predict what will happen when you release a new species into the wild
   b. new species will always add to the biodiversity of an area
   c. both a and b
   d. none of the above

14. Which of the following photosynthesize?
   a. producers
   b. decomposers
   c. consumers
   d. none of the above

15. What do most plants need for photosynthesis to occur?
   a. carbon dioxide, water, and sunlight
   b. oxygen, water, and sunlight
   c. oxygen, carbon dioxide, and water
   d. food, water, and sunlight

16. The category of decomposers includes:
   a. fungi and bacteria
   b. fungi and plants
   c. animals and plants
   d. none of the above

17. A food web shows the flow of _____ through an ecosystem.
   a. consumers
   b. energy
   c. populations
   d. none of the above
18. Which of the following structures are NOT found in plant cells?
   a. cell wall
   b. chloroplasts
   c. nucleus
   d. all of these structures are found in plant cells

19. You watch a worm slowly disappear into the ground. Which statement is an example of an observation?
   a. The worm was looking for food.
   b. The worm was moving away from the light.
   c. The worm burrowed into the ground.
   d. The worm had a lot of energy.

Questions 20–24 refer to the following table:

<table>
<thead>
<tr>
<th>Table 1: Population Over Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>Population</td>
</tr>
</tbody>
</table>

20. If you were to graph the data in Table 1, the best type of graph to create would be a:
   a. bar graph
   b. line graph
   c. circle graph (pie chart)
   d. none of the above

21. If you were to graph the data in Table 1, it would show:
   a. an increase in the population over time
   b. a decrease in the population over time
   c. the population staying the same over time
   d. none of the above

22. If this population were to reach carrying capacity in this area, the population would:
   a. increase over time
   b. decrease over time
   c. stay the same over time
   d. none of the above

23. Which of the following factors could affect this carrying capacity?
   a. the amount of available food
   b. competition with another group of organisms
   c. a change in weather
   d. all of the above
24. Imagine that this population has reached carrying capacity. A competing species enters the area. The carrying capacity for this population is likely to:
   a. increase
   b. decrease
   c. stay the same
   d. first increase, then decrease

25. Ronnie decides to release her pet mouse into the woods behind her house. The possible trade-offs of her decision include:
   a. her mouse may die in its new habitat
   b. she may have introduced a new species into the woods
   c. both a and b
   d. there are no trade-offs associated with her decision

26. Decomposers:
   a. convert the sun’s energy into energy stored as food
   b. create energy for consumers
   c. eat other living organisms for energy
   d. break down dead and waste matter

27. Which of the following may affect the size of a population?
   a. availability of oxygen
   b. pollution
   c. both a and b
   d. none of the above

28. Without the sun, which of the following could no longer occur?
   a. photosynthesis
   b. decomposition
   c. population fluctuation
   d. predation

Questions 29–33 refer to the following paragraph:

A new species of fish has been introduced into Lake Hiawatha. This fish eats minnows, a smaller fish that already live in the lake.

29. What do you predict will happen to the population of minnows in Lake Hiawatha?
   a. it will increase
   b. it will decrease
   c. it will stay the same
   d. it will first increase, then decrease
30. What do you predict will happen to the population of the new species of fish in Lake Hiawatha?
   a. it will increase  
   b. it will decrease  
   c. it will stay the same  
   d. it will first decrease, then increase

31. The original source of energy in this lake is:
   a. plants  
   b. the sun  
   c. fish  
   d. none of the above

32. The new species of fish has added another _____ to the lake.
   a. producer  
   b. decomposer  
   c. consumer  
   d. none of the above

33. The introduction of this new species of fish into Lake Hiawatha provides an example of:
   a. competition  
   b. population fluctuation  
   c. predation  
   d. a trade-off

34. In a particular area, the interaction of climate, geography, and plant and animal life is called
   a. a biome  
   b. a population  
   c. a community  
   d. an ecosystem

35. The main reason some introduced species survive and overpopulate an area is that:
   a. there are often no natural predators in the area  
   b. there is often not enough food for other organisms  
   c. most organisms can survive in new habitats  
   d. people feed them

36. Which of the following is a population?
   a. all of the animals in the same phylum  
   b. all of the garden snails that live in a specific garden  
   c. all of the species of plants and animals that live in a forest  
   d. none of the above
37. Every organism requires a certain amount of water, oxygen, and food. Together, these requirements of an organism of its environment define its:
   a. ecosystem
   b. population
   c. substrate
   d. habitat

38. Which of the following statements about classifying organisms is TRUE?
   a. classification shows relationships among different groups of organisms
   b. classification cannot be used to help identify organisms
   c. the system of biological classification is organized randomly
   d. none of the above

The questions below (39 and 40) refer to the graph shown below. It is a graph of the population of birds in a state park.

39. Based on this graph, you can conclude that:
   a. the population of birds in this park has grown
   b. the population of birds in this park has decreased
   c. the population of birds in this park will soon disappear
   d. the population of birds in this park will increase in the future

40. Possible explanations for the change in the bird population include:
   a. an increase in the amount of available food
   b. a decrease in the number of predators
   c. the introduction of a competing species
   d. none of the above

41. The five-kingdom classification system divides living things into 5 groups; plants, animals, fungi, protists and bacteria. The 6-kingdom system had those five groups plus Archaea. Archaea used to be grouped with
   a. animals
   b. bacteria
   c. protists
   d. none of the above
42. The 3-domain classification system divides living things into three groups—archaea, bacteria, and eukaryote. Eukaryotes include all organisms
   a. that photosynthesize
   b. that are in a food web
   c. that are multi-cellular
   d. that have a nucleus

*Short Answer*

43. a. Microscopic phytoplankton provide food for marine life and produce more than half of the oxygen in the atmosphere. Explain what would happen to the marine biome if the amount of phytoplankton greatly decreased.

__________________________________________________________________________

__________________________________________________________________________

b. Explain how this would affect the earth’s ecosystem.

__________________________________________________________________________

__________________________________________________________________________

44. Why are some introduced (non-native) garden plants (such as purple loosestrife) causing widespread environmental damage, while others (such as roses) are not?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

45. A new kind of tree is brought to an island it has never lived on before. How might this affect some of the other life on the island?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
**Extended Response**

46. A researcher studies the population size of a certain species of fish in a lake for a period of ten years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Fish Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5,840</td>
</tr>
<tr>
<td>2</td>
<td>4,820</td>
</tr>
<tr>
<td>3</td>
<td>6,350</td>
</tr>
<tr>
<td>4</td>
<td>5,330</td>
</tr>
<tr>
<td>5</td>
<td>5,934</td>
</tr>
<tr>
<td>6</td>
<td>4,920</td>
</tr>
<tr>
<td>7</td>
<td>2,940</td>
</tr>
<tr>
<td>8</td>
<td>1,480</td>
</tr>
<tr>
<td>9</td>
<td>1,250</td>
</tr>
<tr>
<td>10</td>
<td>1,240</td>
</tr>
</tbody>
</table>

This species of fish has been caught for food for many years; however, at the beginning of Year 7, a small fish canning factory was built near the shore of the lake. Around that time, the average water temperature of the lake increased slightly. The canned fish can be sold to increase local income to the fishing industry.

**a.** Graph the data gathered in this field study on the axes provided.
b. From the viewpoint of an expert on ecology explain what you think might have happened to the fish population. How do you expect the fish population size to change over the next several years? Explain, and use a solid line to show the change on the graph on your answer sheet.

c. Should the factory be forced to shut down, or should the population study be continued for three more years? Discuss the advantages and disadvantages of both choices and explain the trade-offs of your decision.