1. Which of the following are processes in which evolution occurs?

I. Artificial selection

II. Natural selection

III. Genetic Drift

|  |  |
| --- | --- |
| a. | I only |
| b. | II only |
| c. | III only |
| d. | II and III |
| e. | I, II, and III |

1. Which of the following are measurements used to measure diversity within an ecosystem?

I. Species wealth

II. Species richness

III. Species evenness

|  |  |
| --- | --- |
| a. | I only |
| b. | II only |
| c. | III only |
| d. | I, II and III |
| e. | II and III |

1. Which of the following measures of biodiversity takes into account the number of species present and the relative abundance of the species present?

|  |  |
| --- | --- |
| a. | Shannon’s Index |
| b. | Species Richness |
| c. | Species Evenness |
| d. | Biodiversity Index |
| e. | Hardy-Weinberg Index |

1. What cellular processes can create genetic diversity?

I. Mutation

II. Recombination

III. Respiration

|  |  |
| --- | --- |
| a. | I only |
| b. | II only |
| c. | III only |
| d. | I and II |
| e. | I, II, and III |

1. When an organism has a trait that improves that individual’s fitness for an environment, it is known as:

|  |  |
| --- | --- |
| a. | An advantage |
| b. | An adaptation |
| c. | Inherited |
| d. | Increased strength |
| e. | Increased size |

1. Which process can be controlled most directly by humans?

|  |  |
| --- | --- |
| a. | Natural selection |
| b. | Artificial selection |
| c. | Genetic Drift |
| d. | Mutation |
| e. | Genetic Bottleneck |

1. Which of the following is the best example of artificial selection?

|  |  |
| --- | --- |
| a. | Bees pollinating different species of flowers |
| b. | Adaptation of finches to different sources of food on different islands |
| c. | An isolated population of frogs develops a phenotype distinct from the original population |
| d. | Breeding of horses for speed |
| e. | A small population has an unusually high percentage of an rare phenotype |

1. When a population suddenly reduces in size either from habitat loss, natural disaster or other changes in the environment, its genetic variation is affected. When this occurs, this is known as:

|  |  |
| --- | --- |
| a. | Founder effect |
| b. | Geographic isolation |
| c. | Genetic Drift |
| d. | Bottleneck effect |
| e. | Mutation |

1. Which of the following pairs would increase the rate of evolution within a species?

|  |  |
| --- | --- |
| a. | Slow environmental change and high genetic variation |
| b. | Rapid environmental change and large population size |
| c. | Long generation times and low genetic variation |
| d. | Large population size and slow environmental change |
| e. | Short generation time and large population size |

1. Which type of species would be most vulnerable to environmental changes?

|  |  |
| --- | --- |
| a. | Species with a large population size |
| b. | Niche generalists |
| c. | Niche specialists |
| d. | Species with rapid reproductive rates |
| e. | Species with high genetic variation |

1. Which of the following would not be considered when determining the fundamental niche of a species?

|  |  |
| --- | --- |
| a. | Reproductive rate |
| b. | pH tolerance |
| c. | Temperature tolerance |
| d. | Salinity |
| e. | Soil moisture content |

1. Which of the following is not considered to be contributing to the current increase in extinction rates?

|  |  |
| --- | --- |
| a. | Habitat destruction |
| b. | Natural selection |
| c. | Overharvesting |
| d. | Introduction of invasive species |
| e. | Climate change |

12. Which of the following is the best example of artificial selection?

|  |  |
| --- | --- |
| a. | Bees pollinating different species of flowers |
| b. | Adaptation of finches to different sources of food on different islands |
| c. | An isolated population of frogs develops a phenotype distinct from the original population |
| d. | Breeding of horses for speed |
| e. | A small population has an unusually high percentage of an rare phenotype |

13 A population of rabbits with typical variations of traits lives in a meadow with a depression that runs through the middle. Over time, the depression fills in with water and becomes a river, separating the one population into two over a period of several years. This is an example of:

|  |  |
| --- | --- |
| a. | Artificial selection |
| b. | Mutation |
| c. | Sympatric speciation |
| d. | Bottleneck effect |
| e. | Allopatric speciation |

14. Which of the following pairs would increase the rate of evolution within a species?

|  |  |
| --- | --- |
| a. | Slow environmental change and high genetic variation |
| b. | Rapid environmental change and large population size |
| c. | Long generation times and low genetic variation |
| d. | Large population size and slow environmental change |
| e. | Short generation time and large population size |

15. Which type of species would be most vulnerable to environmental changes?

|  |  |
| --- | --- |
| a. | Species with a large population size |
| b. | Niche generalists |
| c. | Niche specialists |
| d. | Species with rapid reproductive rates |
| e. | Species with high genetic variation |

**Chapter 6**

16. The organisms that represent all of the different interacting species within an ecosystem make up a

|  |  |
| --- | --- |
| a. | population |
| b. | community |
| c. | trophic level |
| d. | biosphere |
| e. | Genus |

17. An ecosystem’s carrying capacity for a population is determined by all of the following factors EXCEPT

|  |  |
| --- | --- |
| a. | space. |
| b. | energy. |
| c. | water. |
| d. | food. |
| e. | climatic events, such as tornadoes. |

18. An exotic species is one which \_\_\_\_\_\_\_\_\_\_an ecosystem

|  |  |
| --- | --- |
| a. | is rare in |
| b. | is foreign to |
| c. | does not interact with other species in |
| d. | is the most dominant species in |
| e. | Destroys |

19. A laboratory experiment followed the growth of a flour beetle (*Tribolium sp.*) population over time. At first the population increased dramatically but later growth slowed and the population size leveled off. While food (the wheat flour in which they live) was abundant, it was noticed that flour beetles resorted to eating their own eggs when densities got high. What can we conclude about cannibalism in this species?

|  |  |
| --- | --- |
| a. | It has no effect on the growth of the population, as food scarcity is clearly the limiting factor here. |
| b. | It is clearly maladaptive as populations always do best when their densities rise as high as  possible. |
| c. | It serves as a density-dependent means of population control. |
| d. | It serves as a density-independent means of population control. |
| e. | We cannot reach any conclusion based on the information provided. |

20. Most parasites have evolved to \_\_\_\_\_their host.

|  |  |
| --- | --- |
| a. | kill |
| b. | only weaken |
| c. | have no effect on |
| d. | strengthen |
| e. | Not enough information to tell |

21. Which of the following is a density-independent event that could limit the size of a population?

|  |  |
| --- | --- |
| a. | a mild winter, which reduces death rates |
| b. | the accidental spill of a pesticide that causes the population to decrease |
| c. | an increase in a predator population |
| d. | the reduction of a competitor species |
| e. | an outbreak of a parasite that spreads through close contact |

22. The biologist who studies interactions at the “community” level investigates interactions between

|  |  |
| --- | --- |
| a. | organisms of one species |
| b. | populations of more than one species. |
| c. | animals of one species. |
| d. | social animals (like insects). |
| e. | ecosystems. |

23. If you were studying the niche of a species of bird, you might study

|  |  |
| --- | --- |
| a. | the food it eats. |
| b. | its predators. |
| c. | the temperatures it needs to survive. |
| d. | the places where it builds its nests. |
| e. | all of the above |

24. Two species that have a high degree of niche overlap will

|  |  |
| --- | --- |
| a. | compete intensely. |
| b. | speciate. |
| c. | interbreed. |
| d. | be a predator-prey pair. |
| e. | coexist peacefully. |

25. Which of these outcomes is likely in a natural situation when two closely related species compete for resources in the same habitat?

|  |  |
| --- | --- |
| a. | Population size and distribution of each species may be reduced. |
| b. | Interbreeding between the two species will occur. |
| c. | One of the species will always become extinct. |
| d. | Both species will become extinct. |
| e. | Distribution and size of both populations will increase. |

26. Earthworms live in many grass and forest ecosystems, and aerate soil as they burrow. They ingest organic matter and travel between soil horizons. These traits, taken collectively, refer to the \_\_\_\_\_\_\_of the earthworm.

|  |  |
| --- | --- |
| a. | niche |
| b. | habitat |
| c. | community profile |
| d. | ecosystem profile |
| e. | resource partition profile |

27. Over the past century, sagebrush has dramatically expanded its range over the Colorado Plateau’s grasslands. This has been attributed to the overgrazing of the area’s grasses by cattle and sheep. This example indicates that

|  |  |
| --- | --- |
| a. | grazing has no effect on the distribution of plants. |
| b. | sagebrush could not exist anywhere in the absence of cattle and sheep. |
| c. | sagebrush is the dominant competitor over grasses. |
| d. | the range of sagebrush is normally limited by competition with grasses. |
| e. | the relationship between sagebrush and grasses is mutualistic. |

28. Sap-feeding insects that feed on plants may be classified as

|  |  |
| --- | --- |
| a. | predators. |
| b. | parasites. |
| c. | hosts. |
| d. | commensalists. |
| e. | prey. |

42. Many plants have their roots infected with a specialized fungus. The plant supplies carbon to the fungus, and the fungus supplies nutrients to the plant. This is an example of a \_\_\_\_\_\_\_\_\_ association.

|  |  |
| --- | --- |
| a. | mutualistic |
| b. | commensalistic |
| c. | parasitic |
| d. | successional |
| e. | predator/prey |

43. A species that plays a major role in determining the structure of its ecological community is

|  |  |
| --- | --- |
| a. | a predator. |
| b. | a dominator species. |
| c. | the most abundant species in the community. |
| d. | a keystone species. |
| e. | the largest species. |

Chapter 7 Review

1. How is the birth rate of a population expressed?
2. What is the critical factor needed to control human population growth?
3. Describe the total fertility rate.
4. Explain what it means when a country’s population pyramid is narrower at the bottom than at the top.
5. Why are population growth rates higher in developing countries?
6. The United States has a low birth rate and yet the population continues to grow. Why is this?
7. Describe what the Earth’s human population is doing right now.
8. If a population is growing at 15%, estimate the doubling time using the rule of 90.
9. China is considered a developing nation, and yet it has a larger eco footprint than most developing countries. Explain this.
10. How much of the world population is considered urban? Approximately how many resources do they use?
11. What is GDP? What does it include?
12. What did Malthus say about how human populations grow in comparison to food supply?
13. How are the infant mortality rates and child mortality rates defined?
14. What part of the world has the highest occurrence of HIV infection?
15. If a country’s total fertility rate is equal to the replacement level fertility, what can you conclude about this country?