

Benchmark Test 6

Choose the letter of the best answer.

1 Compared with all other biomes, tropical rain forests generally have the greatest biodiversity. This means that, compared with the other biomes, the tropical rain forest has the

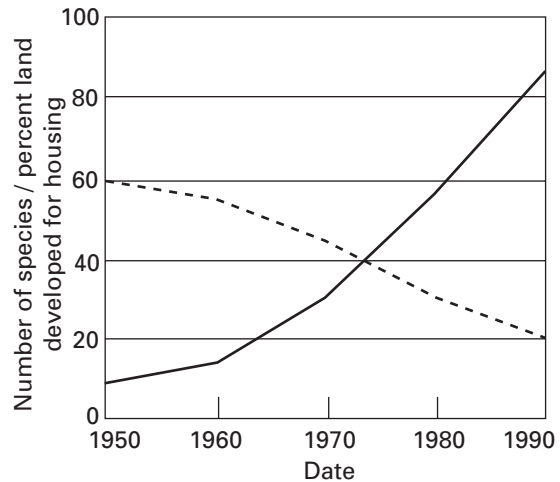
- A** largest populations of its existing species.
- B** highest number of different species present.
- C** most species that are also found in other biomes.
- D** greatest variety of climates and habitats.

2 Suppose you compare the biodiversity of two streams with the same width and depth. Each is a tributary that flows into the same river, but the streams are several kilometers apart. Stream A is located near a large industrial city, and Stream B flows through an undisturbed forest. The lower biodiversity of Stream A might best be explained by

- A** greater water pollution in Stream A.
- B** habitat alteration in Stream B.
- C** more predators in Stream B.
- D** lower oxygen levels in Stream A.

3 Change in Forest Species

— percent land developed
 - - - number of species



The graph represents hypothetical changes in a forested area between 1950 and 1990. It shows the number of species counted in the area as well as the percentage of the area developed for housing. Which statement *best* describes the relationship shown?

- A** Developing the land has only small effects on biodiversity.
- B** Development alters habitats, so biodiversity declines.
- C** Biodiversity declines because water becomes scarce.
- D** Declines in biodiversity stabilize after development increases.

4 Biodiversity is measured and compared for four adjacent spreads of forest that vary slightly in how they have been managed. Which of the following will likely have the highest biodiversity?

- A** forest surrounded by a fence to keep out predators
- B** forest managed to control wildfires and insect pests
- C** forest left unmanaged, not treated for fires or pests
- D** forest left unmanaged but divided by roads that cross it

5 Scientific research suggests that the ranges of many temperate organisms (those found in areas with moderate climates) are gradually extending northward. This phenomenon is probably *best* explained by the effects of

- A** habitat destruction.
- B** introduced species.
- C** disease outbreaks.
- D** global warming.

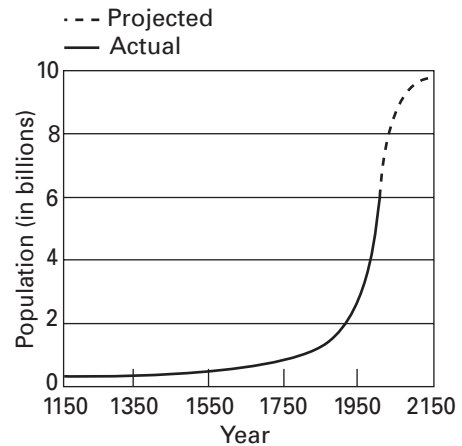
6 A bird population in a small area of tropical forest has a death rate that is equal to its birth rate. If the population experiences a rapid growth, this is *most* likely to be the result of

- A** its high birth rate.
- B** a declining death rate.
- C** new individuals immigrating.
- D** other species leaving.

7 Typically, the strong winds off the coast of South America cause deep, cold water that is rich in nutrients to rise to the surface. These nutrients provide an abundant food supply for coastal fishes. But during an El Niño-Southern Oscillation event, unusually weak winds fail to drive the upward movement of this water. What is the *most* likely description of the main immediate effect this change has on the coastal ecosystem?

- A** Coastal fish populations move to greater depths to find food.
- B** Coastal fish populations crash; deep-water animals thrive.
- C** Coastal fish populations are replaced by other species.
- D** Coastal fish populations adapt to the nutrient-poor water.

8 WORLD POPULATION



According to the graph of world population over time, when did the human population start to grow exponentially?

- A** 1150
- B** 1350
- C** 1950
- D** 2150

9 Wolves are an example of a top predator that has been eliminated from many areas through hunting. Which is the *most* reasonable explanation of the fact that scientists observed greater plant diversity in Yellowstone National Park after gray wolves were reintroduced there?

- A** Wolf populations contribute nutrients that support plants.
- B** Wolf packs reduce populations of elk that eat plants.
- C** Wolf packs create open areas for plants to grow.
- D** There is no connection between the two events.

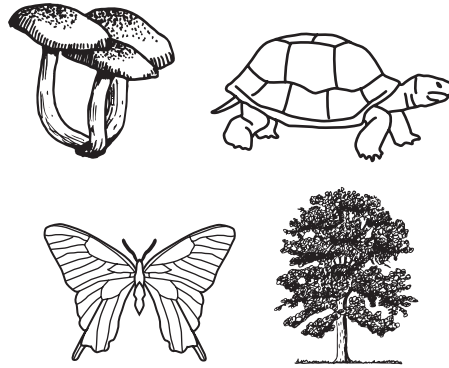
10 A hypothetical small pond has two equal populations of different fish species, species X and species Y. Suppose a child releases a nonnative species, species Z, into the pond. After some time, the population of fish species X is very small and still declining, yet Y and Z are growing rapidly. Which of these might be the *best* description of the relationship among the three species?

- A** Z is a predator of X; X was a predator of Y.
- B** Z preys upon X; Y preys upon Z.
- C** X and Y are susceptible to diseases that Z carries.
- D** Both X and Z are predators of Y.

11 Zoologists are studying wild horses living on two very similar, isolated islands. Each island has abundant resources and few diseases. At the start of the study, the number of horses is the same on each island, but after a year, one population is much larger than the other. What is the *most* likely explanation for this difference?

- A** The smaller population experiences less predation.
- B** The individuals on one island are larger than on the other.
- C** The smaller population has more resources than the other.
- D** The larger population contains more horses of breeding age.

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Which of these organisms represents a group that plays the important role of breaking down organic matter in an ecosystem?

- A** mushrooms (fungi)
- B** turtle (vertebrates)
- C** butterfly (invertebrates)
- D** tree (plants)

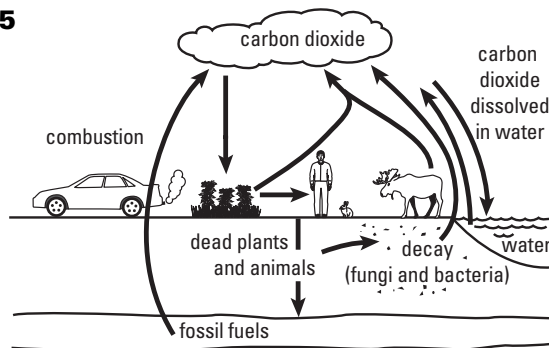
13 Dead organic matter, rocks, wood, and fossil fuels are all sources of an element that cycles back and forth between the environment and living organisms. Which of the following elements is the major component in these sources?

- A nitrogen
- B carbon
- C oxygen
- D hydrogen

14 Through nitrogen fixation, bacteria convert nitrogen gas into ammonia. This is an important step in

- A decomposition of organisms.
- B chemosynthesis.
- C the nitrogen cycle.
- D predator-prey relationships.

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The diagram shows two processes that are responsible for cycling oxygen and carbon dioxide between animals and plants. These two processes are

- A decomposition and uptake.
- B photosynthesis and respiration.
- C glycolysis and fermentation.
- D transpiration and evaporation.

16 In the water cycle, water vapor enters the atmosphere through evaporation and

- A condensation.
- B transpiration.
- C seepage.
- D precipitation.

17 One direct way that plants participate in the cycling of carbon is by

- A converting carbon dioxide to sugars during photosynthesis.
- B releasing carbon dioxide to the atmosphere.
- C providing shade that aids in decomposition of organisms.
- D releasing carbon dioxide through cellular respiration.

18 A decrease in the population of which of the following species would *most* likely lead to a disruption in the entire ecosystem of a rocky shore environment?

- A rock crab
- B barnacles
- C green algae
- D rock bass

19 Which of these groups of organisms forms the base of all stable ecosystems?

- A consumers
- B herbivores
- C heterotrophs
- D producers

20 Small mammals (mice, voles) in a meadow experience rapid population growth during a rainy period when food is abundant. Although the death rate doesn't increase, the population declines considerably the next year, at the onset of a drought. What has probably happened in these populations?

- A Emigration has increased.
- B Infant mortality has decreased.
- C Birth rate has increased.
- D Mating age has increased.

21 One theory explaining the disappearance of dinosaurs is that a meteor impact released enough debris into the atmosphere to block sunlight. This would eventually cause dinosaur populations to decline by

- A reducing the quality of their habitat.
- B interrupting the ability of dinosaurs to find mates.
- C making it impossible for plants to carry out photosynthesis.
- D causing mutations in dinosaur species.

22 An energy pyramid illustrates that, when energy is transferred from one organism to another, much of it is lost to the environment in the form of

- A organic matter.
- B inorganic nutrients.
- C heat.
- D carbon.

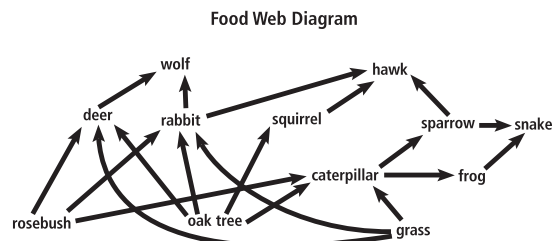
23 Some energy is not lost to the environment. Energy that travels up a pyramid from plants to animals is used to fuel

- A photosynthesis.
- B growth and cellular respiration.
- C carbon dioxide formation.
- D decomposition of plants.

24 Which of these groups of organisms would be pictured at the point of an energy pyramid where the least energy is available?

- A decomposers
- B producers
- C herbivores
- D top consumers

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In addition to feeding relationships, what does a food web such as the one pictured here indicate about an ecosystem?

- A the flow of energy between organisms
- B the biodiversity of organisms
- C the cycling of water and carbon
- D the cycling of oxygen between plants and animals