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**Chapter 41 Practice****Multiple Choice***Identify the choice that best completes the statement or answers the question.*

- \_\_\_\_\_ 1. Which is usually a primary carnivore?
- chicken
  - cow
  - rabbit
  - wolf
  - squirrel
- \_\_\_\_\_ 2. Plant cells assimilate nitrogen in the form of
- ammonia and  $N_2$ .
  - $N_2$  and nitrite.
  - nitrate and ammonia.
  - urea and nitrate.
  - $N_2$  and urea.
- \_\_\_\_\_ 3. Which of the following contribute to water pollution?
- dumping raw sewage into the ocean
  - leaching from landfills
  - runoff from fields and lawns
  - chemicals from manufacturing plants
  - all of these
- \_\_\_\_\_ 4. Desalination may not be a good method for producing large amounts of freshwater because
- it requires huge amounts of energy.
  - it produces undrinkable water.
  - it produces huge amounts of salt residue.
  - it requires huge amounts of energy and produces undrinkable water.
  - it requires huge amounts of energy and produces huge amounts of salt residues.
- \_\_\_\_\_ 5. The difference between gross primary productivity and net primary productivity is
- the amount of sunlight reflected by plants.
  - the amount of energy used by detritivores and decomposers.
  - the amount of energy used by autotrophs.
  - the rate of herbivorous consumption of autotrophs.
  - the amount of energy used by autotrophs, detritivores, and decomposers.
- \_\_\_\_\_ 6. The Hubbard Brook watershed studies revealed the importance of tree roots in preventing loss of calcium from an ecosystem. Calculation of calcium loss is performed by sampling the
- roots of the trees.
  - soil of the watershed.
  - stream exiting the watershed.
  - roots of the trees and the soil of the watershed.
  - roots of the trees, the soil of the watershed, and the stream exiting the watershed.

- \_\_\_\_\_ 7. The largest aquifer in the U.S. is partly in which of the following states?
- California and Nevada
  - Kansas and Texas
  - Louisiana and Mississippi
  - Virginia and North Carolina
  - Pennsylvania and New York
- \_\_\_\_\_ 8. At the bottom or base of a pyramid of energy are the
- primary producers.
  - secondary producers.
  - primary consumers.
  - secondary consumers.
  - tertiary consumers.
- \_\_\_\_\_ 9. In Silver Springs, what percentage of the solar energy entering the system is trapped by producers?
- 0.12 percent
  - 1.2 percent
  - 12 percent
  - 24 percent
  - 28 percent
- \_\_\_\_\_ 10. If agricultural soil has been depleted of nitrates, a good crop to plant and subsequently plow under is
- wheat.
  - corn.
  - clover.
  - sugar beets.
  - oats.
- \_\_\_\_\_ 11. Decomposers perform their recycling efforts on organisms
- at the end of a food chain.
  - at the top of a trophic pyramid.
  - that are producers.
  - that are consumers.
  - all of these
- \_\_\_\_\_ 12. Which cannot be placed in a single trophic level?
- oak tree
  - zebra
  - mushroom
  - rabbit
  - grass
- \_\_\_\_\_ 13. Nitrification
- converts ammonia into nitrates.
  - reduces nitrates to nitrites.
  - converts nitrogenous compounds into free nitrogen.
  - is a synonym for nitrogen fixation.
  - converts nitrates to organic nitrogen.

- \_\_\_\_\_ 14. Nitrifying bacteria convert
- ammonia → nitrite → nitrate.
  - nitrate → nitrite → nitrogen gas.
  - nitrate → ammonia.
  - urea → ammonia.
  - nitrogen gas → ammonia.
- \_\_\_\_\_ 15. Nitrogen is released into the atmosphere by
- nitrogen fixation.
  - denitrification.
  - nitrification.
  - ammonification.
  - decomposition.
- \_\_\_\_\_ 16. Some nitrogenous waste products or organic remains of organisms are decomposed by soil bacteria and fungi. The bacteria and fungi use the amino acids for their own growth and, in turn, release the excess as  $\text{NH}_3$  or ammonium ion. This process is
- nitrification.
  - ammonification.
  - denitrification.
  - nitrogen fixation.
  - hydrogenation.
- \_\_\_\_\_ 17. Carbon is introduced into the atmosphere by all of the following means EXCEPT
- respiration.
  - volcanic eruptions.
  - burning of fossil fuels.
  - wind erosion.
  - diffusion from the ocean.
- \_\_\_\_\_ 18. Which of the following statements is false?
- Ecologists use models to represent relationships between biogeochemical cycles and most ecosystems.
  - The physical environment has virtually no reservoir for most elements.
  - Inputs from the physical environment and recycling made possible by decomposers and detritivores maintain the nutrient reserves in an ecosystem.
  - In most major ecosystems, the amount of nutrients that is cycled within the ecosystem is greater than the amount entering or leaving the ecosystem in a given year.
  - Once elements are in the biological compartments of the biogeochemical cycles, they are unlikely to leave until the organism dies.
- \_\_\_\_\_ 19. Which of the following is not a greenhouse gas?
- carbon dioxide
  - chlorofluorocarbon
  - methane
  - nitrous oxide
  - nitrogen

- \_\_\_\_\_ 20. Which is NOT part of the nitrogen cycle?
- denitrification
  - deammonification
  - nitrogen fixation
  - ammonification
  - assimilation and biosynthesis
- \_\_\_\_\_ 21. What percentage of the energy in producers is transferred to the herbivores?
- 0.016 percent
  - 0.16 percent
  - 1.6 percent
  - 16 percent
  - 48 percent
- \_\_\_\_\_ 22. Which of the following is evidence that global warming is taking place?
- There has been a 1°F rise in the Earth's mean temperature.
  - Nine of the ten hottest years on record occurred between 1990 and 2003.
  - Many glaciers are retreating.
  - Sea levels have risen 20 cm.
  - all of these
- \_\_\_\_\_ 23. Which plants are planted to increase the amount of nitrogen in the soil?
- watermelon and cantaloupe vines
  - legumes
  - mints
  - grasses
  - heaths
- \_\_\_\_\_ 24. Most of the water vapor in the Earth's atmosphere comes from evaporation from
- lakes.
  - rivers.
  - land.
  - oceans.
  - plants.
- \_\_\_\_\_ 25. Primary carnivores are
- tertiary consumers in the third trophic level.
  - secondary consumers in the third trophic level.
  - secondary consumers in the second trophic level.
  - tertiary consumers in the fourth trophic level.
  - primary consumers in the second trophic level
- \_\_\_\_\_ 26. Four of the five answers listed below pass through the atmosphere during their cycling. Select the exception.
- carbon
  - oxygen
  - nitrogen
  - phosphorus
  - water

- \_\_\_\_\_ 27. Decomposers
- are able to enter a food chain at any trophic level.
  - are the most numerous organisms in an ecosystem.
  - include bacteria and fungi.
  - use energy in organic wastes and remains.
  - all of these
- \_\_\_\_\_ 28. Which of the following is the correct word meaning "to feed"?
- tropic
  - trophic
  - topic
  - trophica
  - tropical
- \_\_\_\_\_ 29. Which substance is magnified during transfers in ecosystems?
- fat-soluble pesticides
  - carbohydrates
  - inorganic phosphates
  - fat-soluble pesticides and carbohydrates
  - carbohydrates and inorganic phosphates
- \_\_\_\_\_ 30. Which is a primary consumer?
- cow
  - dog
  - hawk
  - fox
  - snake
- \_\_\_\_\_ 31. Chemosynthetic organisms are
- primary consumers.
  - secondary consumers.
  - tertiary consumers.
  - primary producers.
  - secondary producers.
- \_\_\_\_\_ 32. Four of the five answers listed below are related by a common action. Select the exception.
- volcanic eruption
  - photosynthesis
  - respiration
  - fire
  - decomposition
- \_\_\_\_\_ 33. DDT affects which of the following?
- bald eagles
  - fish
  - song birds
  - bald eagles and song birds, but not fish
  - a, b, and c only

- \_\_\_\_\_ 34. Herbivores represent the
- primary consumers.
  - secondary consumers.
  - tertiary consumers.
  - primary producers.
  - secondary producers.
- \_\_\_\_\_ 35. The amount of energy that flows through a detrital food web is \_\_\_\_\_ that which flows through a grazing web.
- the same as
  - greater than
  - less than
  - the sum of
  - the difference of
- \_\_\_\_\_ 36. Four of the five answers listed below are heterotrophic. Select the exception.
- consumers
  - carnivores
  - herbivores
  - parasites
  - producers
- \_\_\_\_\_ 37. The release of DDT into the environment to control some insect pests will result in the highest detectable concentrations
- at the bottom of the food chain.
  - in the targeted insect pest.
  - in the middle of the food chain.
  - at the end of the food chain.
  - in producers.
- \_\_\_\_\_ 38. A significant fraction of the Earth's carbon is found in all but which of the following?
- bicarbonate
  - carbonate
  - carbon dioxide
  - cellulose
  - carbon monoxide

### Matching

Choose the one most appropriate answer for each.

- rate at which energy becomes stored in organic compounds through photosynthesis
  - total amount of solar energy stored in organic compounds during photosynthesis
  - interconnected food chains
  - the potential chemical energy remaining (after aerobic respiration by autotrophs) that can still be passed on to other trophic levels
  - DDT spraying program in Borneo
  - a kind of plant that often harbors symbiotic nitrogen fixers in its roots
  - particles of organic waste products, dead or partly decomposed tissues
- \_\_\_\_\_ 39. detritus
- \_\_\_\_\_ 40. webs
- \_\_\_\_\_ 41. net primary production

- \_\_\_\_\_ 42. primary productivity
- \_\_\_\_\_ 43. legumes
- \_\_\_\_\_ 44. gross primary production
- \_\_\_\_\_ 45. biological magnification

Answer questions in reference to the five trophic categories of an ecosystem listed below:

- a. producer
- b. herbivore
- c. carnivore
- d. decomposer
- e. detritivore

- \_\_\_\_\_ 46. A bear feeding on blueberries is functioning as this.
- \_\_\_\_\_ 47. A bear feeding on a salmon is functioning as this.
- \_\_\_\_\_ 48. This is a primary consumer.
- \_\_\_\_\_ 49. An earthworm functions as this.
- \_\_\_\_\_ 50. Most mushrooms function as this.
- \_\_\_\_\_ 51. A Venus flytrap plant obtains its nitrogen when it functions somewhat like one of these.

Answer questions in reference to the four steps of the nitrogen cycles listed below:

- a. nitrogen fixation
- b. nitrification
- c. denitrification
- d. ammonification

- \_\_\_\_\_ 52. The action of bacteria on ammonia, ultimately converting it to nitrate, occurs during this process.
- \_\_\_\_\_ 53. The action of bacteria on urea occurs during this process.
- \_\_\_\_\_ 54. The process whereby nitrite is converted to nitrate is an important part of this process.
- \_\_\_\_\_ 55. The action of bacteria on nitrates, converting them to gaseous nitrogen, occurs during this process.
- \_\_\_\_\_ 56. This is the process whereby gaseous nitrogen is first converted to ammonia and then to other nitrogenous compounds.

