

**IQ**

1. – 10. Write a brief description of each of these levels of biological organization
  1. biosphere
  2. ecosystem
  3. community
  4. population
  5. organism
  6. organs and organ systems
  7. tissues
  8. cells
  9. organelles
  10. molecules
11. How do DNA nucleotides relate to proteins?
12. What type of diverse specialists might be involved in a systems biology team?
13. Give examples of how systems biology may impact medical practice or environmental policy making.
14. What are the main criteria for separating plants, fungi, and animals into kingdoms?
15. Describe in your own words Darwin's theory of natural selection as the mechanism of evolution.
16. How did predators "learn" to avoid coral snakes?
17. Why were the results of the mimicry study presented as the percent of attacks on king snakes in each area rather than the total number of attacks?

**SYK**

This chapter presents 11 unifying themes of biology. Briefly describe each of these in your own words.

18. the cell
19. heritable information
20. emergent properties of biological systems
21. regulation
22. interaction with the environment
23. energy and life
24. unity and diversity
25. evolution
26. structure and function
27. scientific inquiry
28. science, technology, and society.

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 1) A common first step in the scientific method is
  - A) formulation of testable hypotheses.
  - B) formulation of a theory.
  - C) conducting a controlled experiment.
  - D) collecting data.
  - E) a search for relevant materials in the library.
- 2) What characterizes a prokaryotic cell?
  - A) the presence of mitochondria
  - B) the lack of ribosomes
  - C) the presence of a nucleus with no DNA
  - D) the lack of a membrane-enclosed nucleus
  - E) having a cell wall without a cell membrane
- 3) A biologist discovers an organism new to science that has numerous nuclei enclosed by a single cell membrane. Assuming she is a good scientist, what should she do next?

- A) destroy the organism so that the cell theory will not be challenged
  - B) hide the organism from other scientists so as to maximize the financial benefits from her discovery
  - C) hold a press conference to announce that the cell theory is no longer valid
  - D) determine how the organism is related to other organisms with more typical cell structure
  - E) assume that the organism is a mutant life form, and thus is unimportant
- 4) Which of the following statements is NOT true about all living things?
- A) They are made of cells or cell products.
  - B) They are the products of evolution.
  - C) Their composition includes carbon, hydrogen, oxygen, and nitrogen.
  - D) They have a cell wall as an outer boundary.
  - E) They undergo growth and development.
- 5) Which of the following levels in the hierarchy of biological organization includes all of the other levels in the list?
- A) cells
  - B) tissues
  - C) organelles
  - D) atoms
  - E) biological molecules
- 6) Why did the popular press give Reznick and Endler's research on guppies a lot of attention?
- A) They were able to show that the physical environment caused variation in life histories of wild guppy populations.
  - B) Their research was an excellent example of how to use the hypothetico-deductive method in science.
  - C) They showed that pike-cichlids prey mainly on reproductively mature adults and, therefore, cause individual guppy populations to mature more quickly.
  - D) They were able to document evolution over a relatively short time period.
  - E) They proved that water temperature can lead to genetic differences in populations.
- 7) Which of the following levels in the hierarchy of biological organization include all of the other levels in the list?
- A) organ system
  - B) community
  - C) population
  - D) organism
  - E) ecosystem
- 8) What is the primary reason for including a control within the design of an experiment?
- A) To insure that the results obtained are due to a difference in only one variable.
  - B) To provide more data so that one can perform a more sophisticated statistical analysis.
  - C) To demonstrate in what way the experiment was performed incorrectly.
  - D) To accumulate more facts that can be reported to other scientists.
  - E) To test the effect of more than one variable.
- 9) The cell theory is an example of a conclusion based on
- A) application of evolutionary theory.
  - B) inductive reasoning.
  - C) controlled experimentation.
  - D) vitalistic inspiration.
  - E) microscopic study of all organisms.
- 10) Which of the following does NOT comprise a logical hierarchy of organization?
- A) organisms, populations, communities, biomes, biosphere
  - B) molecules, atoms, organelles, tissues, systems
  - C) cells, tissues, organs, organ systems, organisms
  - D) molecules, cells, tissues, organ systems, populations
  - E) family, order, class, phylum, kingdom