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Chapter 1—Evolution, the Themes of Biology, and Scientific Inquiry

MULTIPLE CHOICE

- 1) Cells are_____.
- A) only found in pairs, because single cells cannot exist independently
 - B) limited in size to 200 and 500 micrometers in diameter
 - C) characteristic of eukaryotic but not prokaryotic organisms
 - D) characteristic of prokaryotic and eukaryotic organisms

ANS: D PTS: 1 TOP: Section 1.1
MSC: Knowledge/Comprehension

- 2) In comparison to eukaryotes, prokaryotes_____.
- A) are more structurally complex
 - B) are larger
 - C) are smaller
 - D) do not have membranes

ANS: C PTS: 1 TOP: Section 1.1
MSC: Knowledge/Comprehension

- 3) Which of the following types of cells utilize deoxyribonucleic acid (DNA) as their genetic material but do not have their DNA encased within a nuclear envelope?
- A) animal
 - B) plant
 - C) archaean
 - D) fungi

ANS: C PTS: 1 TOP: Section 1.1
MSC: Application/Analysis

- 4) To understand the chemical basis of inheritance, we must understand the molecular structure of DNA. This is an example of the application of which concept to the study of biology?
- A) evolution
 - B) emergent properties
 - C) reductionism
 - D) feedback regulation

ANS: C PTS: 1 TOP: Section 1.1
MSC: Application/Analysis

- 5) A localized group of organisms that belong to the same species is called a_____.
- A) community
 - B) population
 - C) ecosystem
 - D) family

ANS: B PTS: 1 TOP: Section 1.1
MSC: Knowledge/Comprehension

- 6) Which of the following statements is *true* regarding the complexity of biological systems?
- A) An understanding of the interactions between different components within a living system is an approach towards understanding reductionism.
 - B) Knowing the function of a component of a living system can provide insights into the structure and organization of the living system.
 - C) Understanding the chemical structure of DNA reveals how it directs the functioning of a living cell.
 - D) An ecosystem displays complex properties of the biotic component only.

ANS: B PTS: 1 TOP: Section 1.1
MSC: Application/Analysis

- 7) Which of the following order is correct in terms of the hierarchy of the organization?
- A) Ecosystem → Biosphere → Population → Community → Organism
 - B) Biosphere → Ecosystem → Population → Community → Organism
 - C) Ecosystem → Community → Biosphere → Population → Organism
 - D) Biosphere → Ecosystem → Community → Population → Organism

ANS: D PTS: 1 TOP: Section 1.1
MSC: Application/Analysis

- 8) When your body temperature rises on a hot day, the neural and hormonal mechanisms activate sweating. Evaporation of sweat leads to cooling of the body surface. This is an example of_____.
- A) positive feedback regulation
 - B) negative feedback regulation
 - C) chemical cycling
 - D) emergent properties

ANS: B PTS: 1 TOP: Section 1.1
MSC: Application/Analysis

- 9) Characters are transmitted from parents to offspring. _____are the units of inheritance.
- A) Genes
 - B) Proteins
 - C) RNA
 - D) DNA

ANS: A PTS: 1 TOP: Section 1.1
MSC: Knowledge/Comprehension

- 10) As letters are to English language, _____is/are to genetic information.
- A) proteins
 - B) nucleotides
 - C) DNA double helix
 - D) A and B

ANS: B PTS: 1 TOP: Section 1.1
MSC: Knowledge/Comprehension

- 11) The process by which the information in a gene directs the synthesis of a protein is called _____.
- A) gene expression
 - B) replication
 - C) post translation modification
 - D) cloning

ANS: A PTS: 1 TOP: Section 1.2
MSC: Application/Analysis

- 12) Which of the following statements is true?
- A) mRNA is the only type of RNA found in the living system
 - B) All forms of life employ the same genetic code
 - C) A typical human liver cell has one set of chromosomes
 - D) Organisms interact but do not affect their environment

ANS: B PTS: 1 TOP: Section 1.2
MSC: Knowledge/Comprehension

- 13) Plants convert _____.
- A) chemical energy to mechanical energy.
 - B) sunlight to mechanical energy.
 - C) sunlight to chemical energy.
 - D) mechanical energy to chemical energy.

ANS: C PTS: 1 TOP: Section 1.2
MSC: Knowledge/Comprehension

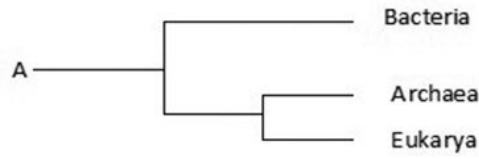
- 14) Which of these provides evidence of the common ancestry of all life?
- A) near universality of the genetic code
 - B) structure of the nucleus
 - C) structure of cilia
 - D) structure of chloroplasts

ANS: A PTS: 1 TOP: Section 1.2
MSC: Application/Analysis

- 15) Which branch of biology is concerned with the naming and classifying of organisms?
- A) informatics
 - B) taxonomy
 - C) genomics
 - D) evolution

ANS: B PTS: 1 TOP: Section 1.2
MSC: Knowledge/Comprehension

Use the following figure to answer the question.



- 16) The phylogenetic tree _____.
- A) depicts that Archaea is closer to Bacteria than Eukarya
 - B) depicts that Eukarya is closer to Bacteria than Archaea
 - C) includes unicellular and some forms of multicellular life, but not complex animals and plants
 - D) includes every single life form on this earth

ANS: D PTS: 1 TOP: Section 1.2
 MSC: Application/Analysis

- 17) "A" is _____; "B" is _____.
- A) the most recent species to evolve on Earth; an ancestor of group "A"
 - B) the most recent species to evolve on Earth; the last common ancestor of Archaea and Eukarya
 - C) the common ancestor of all life; the common ancestor of Bacteria and Archaea
 - D) the common ancestor of all life; the last common ancestor of Archaea and Eukarya

ANS: D PTS: 1 TOP: Section 1.2
 MSC: Application/Analysis

- 18) You are suffering from *Streptococcus* throat infection. You share the following with the bacteria that is responsible for your condition.
- A) You both belong to the same domain.
 - B) You both are made up of cells.
 - C) You both have genetic material in your nucleus.
 - D) You and *Streptococcus* have nothing in common.

ANS: B PTS: 1 TOP: Section 1.2
 MSC: Application/Analysis

- 19) Which of the following is true of natural selection?
- A) It requires genetic variation.
 - B) It results in descent with modification.
 - C) It involves differential reproductive success.
 - D) It requires genetic variation, results in descent with modification, and involves differential reproductive success.

ANS: D PTS: 1 TOP: Section 1.2
 MSC: Knowledge/Comprehension

- 20) Which of the following is *not* one of Charles Darwin's observations?
- A) Individuals in a population vary in their traits.
 - B) Many of the traits in an individual are heritable.
 - C) A population avoids competition by producing only as many offspring as can successfully reproduce on their own.