

**True / False**

1. Evolution is the central organizing principle of the biological sciences.

- a. True
- b. False

*ANSWER:* True

*REFERENCES:* 31

*OTHER:* Factual

*NOTES:* Pickup

2. Linnaeus's classificatory system reflected a new understanding of life on earth at that time.

- a. True
- b. False

*ANSWER:* True

*REFERENCES:* 32

*OTHER:* Conceptual

*NOTES:* New

3. Humans are primates.

- a. True
- b. False

*ANSWER:* True

*REFERENCES:* 32

*OTHER:* Factual

*NOTES:* Pickup

4. The "system of nature" is an approach to classify all of animate and inanimate nature.

- a. True
- b. False

*ANSWER:* False

*REFERENCES:* 32

*OTHER:* Factual

*NOTES:* Pickup

5. Taxonomy is an ancient form of classification created by Linnaeus that is no longer used today.

- a. True
- b. False

*ANSWER:* False

*REFERENCES:* 32

*OTHER:* Factual

*NOTES:* Pickup

6. A bat's wing is analogous to a human hand.

- a. True
- b. False

*ANSWER:* False

*REFERENCES:* 32

*OTHER:* Conceptual

*NOTES:* Pickup

7. Uniformitarianism is a more recent theory than catastrophism.

a. True

b. False

*ANSWER:* True

*REFERENCES:* 33

*OTHER:* Factual

*NOTES:* New

8. Even prior to Darwin's publication, many European naturalists accepted the idea that life had evolved.

a. True

b. False

*ANSWER:* True

*REFERENCES:* 33

*OTHER:* Conceptual

*NOTES:* Pickup

9. Mendel published his findings in a respectable scientific journal, but no one understood their significance until after his death.

a. True

b. False

*ANSWER:* True

*REFERENCES:* 35

*OTHER:* Conceptual

*NOTES:* Pickup

10. Genes are particulate, meaning that they are separate structures rather than portions of DNA.

a. True

b. False

*ANSWER:* False

*REFERENCES:* 36

*OTHER:* Conceptual

*NOTES:* Pickup

11. Darwin could not initially understand how variation occurred in living organisms.

a. True

b. False

*ANSWER:* True

*REFERENCES:* 35

*OTHER:* Conceptual

*NOTES:* New

12. DNA provides the instruction for the thousands of proteins that keep us healthy every day.

- a. True
- b. False

*ANSWER:* True

*REFERENCES:* 36

*OTHER:* Factual

*NOTES:* Pickup

13. The complete sequence of human DNA is called the genome.

- a. True
- b. False

*ANSWER:* True

*REFERENCES:* 37

*OTHER:* Factual

*NOTES:* Pickup

14. If two body cells merge in meiosis, the result is a cell with 46 pairs of chromosomes.

- a. True
- b. False

*ANSWER:* False

*REFERENCES:* 40

*OTHER:* Factual

*NOTES:* Pickup

15. Testing for DNA is the best way to determine those who form part of an individual's family.

- a. True
- b. False

*ANSWER:* False

*REFERENCES:* 41

*OTHER:* Conceptual

*NOTES:* New

16. When two alleles on the same gene are not identical, they are called heterozygous.

- a. True
- b. False

*ANSWER:* True

*REFERENCES:* 42

*OTHER:* Factual

*NOTES:* New

17. In the search for disease cures, scientists often predict an individual's genotype.

- a. True
- b. False

*ANSWER:* False

*REFERENCES:* 42

*OTHER:* Conceptual

*NOTES:* Pickup

18. The only source of new genetic material is random drift.

- a. True
- b. False

ANSWER: False

REFERENCES: 44

OTHER: Factual

NOTES: Pickup

19. Founder effects are a kind of genetic drift.

- a. True
- b. False

ANSWER: True

REFERENCES: 45

OTHER: Conceptual

NOTES: Pickup

20. The existence of *Homo sapiens* as an interbreeding species is due to gene flow.

- a. True
- b. False

ANSWER: True

REFERENCES: 46

OTHER: Factual

NOTES: Pickup

21. Ultimately, all natural selection is measured in terms of reproductive success.

- a. True
- b. False

ANSWER: True

REFERENCES: 46

OTHER: Conceptual

NOTES: New

22. In sickle-cell anemia, the individual does not produce any red blood cells.

- a. True
- b. False

ANSWER: False

REFERENCES: 47

OTHER: Factual

NOTES: New

23. Cultural processes complicate studies of biological adaptation.

- a. True
- b. False

ANSWER: True

REFERENCES: 48

*OTHER:* Conceptual

*NOTES:* New

24. Speciation always occurs quite rapidly.

a. True

b. False

*ANSWER:* False

*REFERENCES:* 49

*OTHER:* Factual

*NOTES:* New

25. Cladogenesis is a sustained directional shift in a population's gene pool.

a. True

b. False

*ANSWER:* False

*REFERENCES:* 49

*OTHER:* Factual

*NOTES:* New

### **Multiple Choice**

26. How do anthropologists classify the Nez Perce story about Coyote and Wishpoosh?

a. apocalyptic myth

b. salvation myth

c. children's myth

d. creation myth

*ANSWER:* d

*REFERENCES:* 31

*OTHER:* Conceptual

*NOTES:* Pickup

27. Which of the following describes the primary difference between creation stories and evolution?

a. Creation stories are particular to cultures, and evolution is bound by hypotheses and scientific language.

b. Creation stories are cyclical in nature, and evolution is a linear theory.

c. Evolution explains how things change, and creation stories do not change.

d. Evolution is a Western theory, and creation stories are not found in the West.

*ANSWER:* a

*REFERENCES:* 31

*OTHER:* Conceptual

*NOTES:* New

28. Evolution can be described as:

a. an anti-creationist account of the origin of life

b. the foundation of culture in contemporary society

c. the major organizing principle of the biological sciences

d. the major organizing principle of the social sciences

ANSWER: c  
REFERENCES: 31  
OTHER: Factual  
NOTES: Pickup

29. All of the following are true of evolution except:
- a. It provides an explanation for the diversity of life.
  - b. It emphasizes human uniqueness and human origin.
  - c. It utilizes hypotheses as a way of testing.
  - d. It uses consistent scientific language.

ANSWER: b  
REFERENCES: 31  
OTHER: Conceptual  
NOTES: New

30. Which of the following statements is false?
- a. Evolution explains diversity through scientific language using hypotheses.
  - b. Evolution explains diversity through scientific language using theories.
  - c. Evolution can explain diversity, and creation myths cannot.
  - d. Creation myths and evolutionary accounts do not differ in any substantial way.

ANSWER: d  
REFERENCES: 31  
OTHER: Conceptual  
NOTES: Modify

31. Which scientist developed the *Systema Naturae*?
- a. Aristotle
  - b. Carolus Linnaeus
  - c. Jean-Baptiste Lamarck
  - d. Charles Darwin

ANSWER: b  
REFERENCES: 32  
OTHER: Factual  
NOTES: Pickup

32. Which of the following is the smallest working unit in biological classification?
- a. phylum
  - b. mammal
  - c. genus
  - d. species

ANSWER: d  
REFERENCES: 32  
OTHER: Factual  
NOTES: New

33. Linnaeus noted the similarities among humans, monkeys, and apes and classified them as:

- a. hominids
- b. primates
- c. anthropoids
- d. apes

ANSWER: b

REFERENCES: 32

OTHER: Factual

NOTES: New

34. Mammals have all of the following characteristics except:

- a. They have body hair.
- b. They nurse their young.
- c. They do not give birth to live young.
- d. They include the primates.

ANSWER: c

REFERENCES: 32

OTHER: Factual

NOTES: New

35. A reproductively isolated population or group capable of interbreeding to produce fertile offspring is a:

- a. genus
- b. category
- c. family
- d. species

ANSWER: d

REFERENCES: 32

OTHER: Factual

NOTES: Pickup

36. How would you best describe a genus?

- a. a group of like species
- b. a subdivision of species
- c. a subspecies
- d. archaic forms of species

ANSWER: a

REFERENCES: 32

OTHER: Conceptual

NOTES: Pickup

37. Linnaeus based his classificatory system on each of the following except:

- a. sequence of bodily growth
- b. body structure
- c. body function
- d. body size

ANSWER: d

REFERENCES: 32

*OTHER:* Conceptual

*NOTES:* New

38. *Homo* describes a human:

- a. order
- b. homology
- c. genus
- d. species

*ANSWER:* c

*REFERENCES:* 32

*OTHER:* Factual

*NOTES:* Pickup

39. The comparison of the anatomical structures of wings on a bat to the wings on a butterfly is an example of:

- a. homology
- b. taxonomy
- c. analogy
- d. phylogeny

*ANSWER:* c

*REFERENCES:* 32

*OTHER:* Conceptual

*NOTES:* Pickup

40. The comparison of the anatomical structures of a human arm to the wing of a bat is an example of:

- a. homology
- b. taxonomy
- c. analogy
- d. phylogeny

*ANSWER:* a

*REFERENCES:* 32

*OTHER:* Conceptual

*NOTES:* Pickup

41. Invoking natural events, such as the great flood in the Book of Genesis, to account for species disappearance is an example of:

- a. exploitation
- b. system of nature
- c. Great Chain of Being
- d. catastrophism

*ANSWER:* d

*REFERENCES:* 33

*OTHER:* Conceptual

*NOTES:* Pickup

42. The theory that maintains that although some changes in the earth's surface are immediately observable and caused by erosion and other natural processes, other changes are caused by gradual processes over extremely long periods of time is



called:

- a. natural selection
- b. catastrophism
- c. linearism
- d. uniformitarianism

ANSWER: d

REFERENCES: 33

OTHER: Factual

NOTES: New

43. Of the following, which is the widest (most broad and inclusive) taxonomic category?

- a. family
- b. order
- c. phylum
- d. species

ANSWER: c

REFERENCES: 33

OTHER: Factual

NOTES: Modify

44. Darwin's theory was known as the theory of:

- a. natural selection
- b. natural variation
- c. animal evolution
- d. circumnavigation

ANSWER: a

REFERENCES: 34

OTHER: Factual

NOTES: Pickup

45. Who proposed that animal populations remained stable over time because of the high proportion of animal offspring not surviving to maturity?

- a. Gregor Mendel
- b. Charles Darwin
- c. Thomas Malthus
- d. Charles Lyell

ANSWER: c

REFERENCES: 34

OTHER: Factual

NOTES: Pickup

46. Whose research developed the basic laws of heredity?

- a. Gregor Mendel
- b. Charles Lyell
- c. Thomas Malthus
- d. Charles Darwin

*ANSWER:* a  
*REFERENCES:* 35  
*OTHER:* Factual  
*NOTES:* Modify

47. Today, Darwin's evolutionary theory is supported by data from all of the following except:

- a. population genetics
- b. heredity
- c. molecular genetics
- d. protogenetics

*ANSWER:* d  
*REFERENCES:* 35  
*OTHER:* Conceptual  
*NOTES:* Modify

48. What was scientific about Gregor Mendel's approach to gardening?

- a. He was a scientist and worked to create commercial plants.
- b. He took systematic notes and was able to identify patterns of heredity.
- c. He bred garden plants to obtain higher yields.
- d. He worked to breed garden plants to obtain better varieties.

*ANSWER:* b  
*REFERENCES:* 35  
*OTHER:* Conceptual  
*NOTES:* Modify

49. The principle that variants of genes for a particular trait retain their separate identities through the generations is called:

- a. natural selection
- b. law of segregation
- c. law of heredity
- d. law of independent assortment

*ANSWER:* b  
*REFERENCES:* 36  
*OTHER:* Factual  
*NOTES:* Pickup

50. A portion of the DNA molecule containing a sequence of base pairs that encodes a particular protein is known as a:

- a. gene
- b. allele
- c. double helix
- d. chromosome

*ANSWER:* a  
*REFERENCES:* 36  
*OTHER:* Factual  
*NOTES:* Pickup

51. Mendel discovered that inheritance was particulate, not:

- a. blended
- b. separated
- c. molded
- d. selected

ANSWER: a

REFERENCES: 36

OTHER: Factual

NOTES: Pickup

52. Alleles are:

- a. the cell nucleus
- b. structures that carry specific proteins
- c. alternate forms of a single gene
- d. pieces of DNA

ANSWER: c

REFERENCES: 36

OTHER: Factual

NOTES: Pickup

53. Sex cell division is called:

- a. independent assortment
- b. segregation
- c. meiosis
- d. mitosis

ANSWER: c

REFERENCES: 40

OTHER: Factual

NOTES: Pickup

54. Which of the following is not one of the four base pairs?

- a. glucosamine
- b. cytosine
- c. adenine
- d. thymine

ANSWER: a

REFERENCES: 37

OTHER: Factual

NOTES: Pickup

55. The process of transcription is related to:

- a. the conversion of DNA into a protein
- b. the division of cells in a sister chromatid
- c. the replication of cells in segregation
- d. mutation events in reproduction

ANSWER: a

*REFERENCES:* 37

*OTHER:* Conceptual

*NOTES:* New

56. In protein synthesis, all of the following are involved except:

- a. RNA
- b. ribosomes
- c. codon
- d. fovea centralis

*ANSWER:* d

*REFERENCES:* 37

*OTHER:* Factual

*NOTES:* New

57. Cell division begins when chromosomal DNA replicates and each chromosome becomes a pair of:

- a. nuclei
- b. sister chromatids
- c. mother chromatids
- d. eukaryotes

*ANSWER:* b

*REFERENCES:* 38

*OTHER:* Conceptual

*NOTES:* New

58. Cell division that involves exact replication of parent cells is called:

- a. mitosis
- b. mitochondriosis
- c. meiosis
- d. cloning

*ANSWER:* a

*REFERENCES:* 38

*OTHER:* Factual

*NOTES:* Pickup

59. Proteins are significant to the life of the organism in various ways. Those that initiate and direct chemical reactions are called:

- a. enzymes
- b. protons
- c. codons
- d. ribosomes

*ANSWER:* a

*REFERENCES:* 37

*OTHER:* Factual

*NOTES:* New

60. Which of the following terms best describes the 3 billion chemical bases with 20,000 to 25,000 genes that define

humans?

- a. ribosome
- b. genome
- c. enzyme
- d. transcription

ANSWER: b

REFERENCES: 37

OTHER: Factual

NOTES: New

61. During meiosis, genes are divided into:

- a. two new cells
- b. four new cells
- c. six new cells
- d. eight new cells

ANSWER: b

REFERENCES: 40

OTHER: Factual

NOTES: Pickup

62. In the “Biocultural Connection,” why did the U.S. government support using DNA tests at the Dadaab refugee camp in Nairobi, Kenya?

- a. to test individuals for basic health and determine carriers of disease
- b. to test asylum seekers to determine whether they were related to a U.S. citizen
- c. to test families to see if they were legitimate refugees in the U.S. facility there
- d. to test whether any of those seeking asylum has originated in the United States

ANSWER: b

REFERENCES: 41

OTHER: Conceptual

NOTES: New

63. What deficiencies were revealed in the DNA testing protocol among refugees in the Dadaab refugee camp in Nairobi, Kenya?

- a. Family relationship is not solely constituted by biology.
- b. Families did not always carry the same types of genetic markers.
- c. Families did not understand why DNA was needed and often refused.
- d. Families did not want to live with relatives in the United States.

ANSWER: a

REFERENCES: 41

OTHER: Conceptual

NOTES: New

64. If a young man has type A blood, this is his:

- a. DNA
- b. genome
- c. phenotype

d. genotype

ANSWER: c

REFERENCES: 42

OTHER: Factual

NOTES: Pickup

65. Chimpanzees and humans share what percentage of DNA similarity?

a. 90

b. 95

c. 97

d. 98

ANSWER: d

REFERENCES: 43

OTHER: Factual

NOTES: Pickup

66. The chimp's genome is estimated to be what percentage larger than the human's?

a. 50

b. 75

c. 10

d. 25

ANSWER: c

REFERENCES: 43

OTHER: Factual

NOTES: Pickup

67. Because type O blood is codominant, a woman with type O blood knows that OO is her:

a. DNA

b. genome

c. phenotype

d. genotype

ANSWER: d

REFERENCES: 42

OTHER: Conceptual

NOTES: Pickup

68. Which of the following best describes polygenetic inheritance?

a. An individual receives multiple alleles from more than two parents.

b. Characteristics resulting from polygenetic inheritance exhibit a wide variation in genotypic expression.

c. Characteristics resulting from polygenetic inheritance exhibit a wide variation in phenotypic expression.

d. Characteristics most commonly result in mutation.

ANSWER: c

REFERENCES: 44

OTHER: Conceptual

NOTES: New

69. All of the following are evolutionary forces except:

- a. genetic drift
- b. gene flow
- c. genetic cloning
- d. mutation

ANSWER: c

REFERENCES: 44

OTHER: Factual

NOTES: Pickup

70. In evolutionary terms, what kind of force is mutation?

- a. It is negative because mutation decreases chances for survival.
- b. It is positive because it provides variation for selection.
- c. It is neutral because variation does not matter in the long run.
- d. Mutation cannot be evaluated in these terms.

ANSWER: b

REFERENCES: 44

OTHER: Conceptual

NOTES: Pickup

71. What variable force is most important to adaptation over time?

- a. founder effects
- b. genetic drift
- c. random mutation
- d. gene flow

ANSWER: c

REFERENCES: 44

OTHER: Conceptual

NOTES: Pickup

72. Chance fluctuations of allele frequencies in the gene pool of a population are evidences of:

- a. genetic drift
- b. gene flow
- c. mutation
- d. directional selection

ANSWER: a

REFERENCES: 44

OTHER: Factual

NOTES: Pickup

73. Founder effects is a type of:

- a. gene flow
- b. genetic drift
- c. natural selection
- d. environmental selection

ANSWER: b

*REFERENCES:* 45

*OTHER:* Factual

*NOTES:* Pickup

74. A small group of people with several color-blind individuals moves from the mainland to a previously uninhabited, secluded island. Two hundred years later, 5 percent of the people of the island have color-blindness. This is an example of:

- a. founder effects
- b. population bottleneck
- c. mutation
- d. gene flow

*ANSWER:* a

*REFERENCES:* 45

*OTHER:* Conceptual

*NOTES:* Pickup

75. Interbreeding allows for:

- a. gene flow
- b. genetic drift
- c. genetic cloning
- d. genetic testing

*ANSWER:* a

*REFERENCES:* 46

*OTHER:* Conceptual

*NOTES:* Modify

76. Which evolutionary force keeps populations from developing into separate species?

- a. founder effects
- b. mutation
- c. random genetic drift
- d. gene flow

*ANSWER:* d

*REFERENCES:* 46

*OTHER:* Conceptual

*NOTES:* Modify

77. A painful disease in which oxygen-carrying red blood cells change into abnormal shapes is called:

- a. anemia
- b. natural blood selection
- c. trisomy 21
- d. sickle-cell anemia

*ANSWER:* d

*REFERENCES:* 47

*OTHER:* Factual

*NOTES:* Pickup



78. Adaptation can best be described as:

- a. an inherited form of anemia caused by a mutation
- b. dominant characteristics in the gene pool
- c. a series of beneficial adjustments to the environment
- d. the introduction of alleles from the gene pool of a nonnative population

ANSWER: c

REFERENCES: 46

OTHER: Conceptual

NOTES: Pickup

79. Ultimately all natural selection is biologically measured in terms of:

- a. reproductive success
- b. environmental adaptation
- c. macroevolution
- d. random genetic frequency

ANSWER: a

REFERENCES: 46

OTHER: Conceptual

NOTES: New

80. The biological term *fitness* refers to:

- a. physical and mental prowess
- b. physical stamina and longevity
- c. reproductive potential
- d. stabilizing influences

ANSWER: c

REFERENCES: 46

OTHER: Conceptual

NOTES: New

81. Each of the following commonly affects mutation rates except:

- a. stress
- b. radiation
- c. antibiotics
- d. fitness

ANSWER: d

REFERENCES: 44

OTHER: Conceptual

NOTES: New

82. Which of the following statements about adaptation is incorrect?

- a. Many traits have no adaptive function.
- b. Adaptations are adjustments to a specific environment.
- c. Adaptation at a genetic level reveals natural selection.
- d. Natural selection and adaptation always promote genetic change.

ANSWER: d

*REFERENCES:* 46

*OTHER:* Conceptual

*NOTES:* New

83. When natural selection favors retention of an allele frequency because the population is well adapted, it is referred to as:

- a. reproductive success
- b. stabilizing selection
- c. founder effects
- d. directional selection

*ANSWER:* b

*REFERENCES:* 46

*OTHER:* Factual

*NOTES:* New

84. Sickle-cell anemia is found in highest frequencies in populations from:

- a. East Africa
- b. Central Arica
- c. South Africa
- d. North Africa

*ANSWER:* b

*REFERENCES:* 47

*OTHER:* Factual

*NOTES:* Modify

85. Scientists have found that carrying sickle-cell anemia (meaning, one is heterozygous) protects an individual from:

- a. chicken pox
- b. malaria
- c. pneumonia
- d. common cold

*ANSWER:* b

*REFERENCES:* 47

*OTHER:* Factual

*NOTES:* Pickup

86. The allele for sickle-cell anemia is believed to have originated in areas where there are large populations of mosquitoes bearing:

- a. falciparum malaria
- b. parasitic dysentery
- c. smallpox
- d. yellow fever

*ANSWER:* a

*REFERENCES:* 47

*OTHER:* Factual

*NOTES:* Modify

87. The continuous gradation over space in the form or frequency of a genetic trait is known as a:

- a. stabilizing selection
- b. codon
- c. cline
- d. transcription

ANSWER: c

REFERENCES: 48

OTHER: Factual

NOTES: Modify

88. Why does a bulky body tend to conserve more heat than a slender one?

- a. It has less surface area relative to volume.
- b. It has more surface area relative to volume.
- c. It has more fat regulation.
- d. It is more layered, with fat covering muscles.

ANSWER: a

REFERENCES: 48

OTHER: Conceptual

NOTES: Pickup

89. Anthropologists study biological diversity among populations in terms of:

- a. mutation
- b. gene flow
- c. clines
- d. inheritance

ANSWER: c

REFERENCES: 48

OTHER: Conceptual

NOTES: New

90. Which of the following is most likely to suffer effects from summer heat?

- a. someone with a slender body build and relatively long extremities
- b. someone with a bulky body build and relatively short extremities
- c. someone with a slender body build and relatively short extremities
- d. someone with a bulky body build and rather long extremities

ANSWER: b

REFERENCES: 48

OTHER: Conceptual

NOTES: New

91. The formation of a new species is known as \_\_\_\_\_ while \_\_\_\_\_ focuses on the evolutionary relationships between related species.

- a. macroevolution/microevolution
- b. macroevolution/speciation
- c. speciation/microevolution
- d. speciation/macroevolution

*ANSWER:* d  
*REFERENCES:* 49  
*OTHER:* Conceptual  
*NOTES:* Pickup

92. A sustained directional shift in a population's average characteristics is called:

- a. cladogenesis
- b. genetic drift
- c. anagenesis
- d. speciation

*ANSWER:* c  
*REFERENCES:* 49  
*OTHER:* Factual  
*NOTES:* Pickup

93. If two populations of primates were separated for a substantially long period of time by geographical changes, causing them, over time, to begin developing characteristics that distinguished them from each other, it could result in:

- a. allelic homogeneity
- b. allelic homogeneity
- c. anagenesis
- d. cladogenesis

*ANSWER:* d  
*REFERENCES:* 49  
*OTHER:* Conceptual  
*NOTES:* Pickup

94. What do we call the factors that separate two breeding populations?

- a. fission factors
- b. isolating factors
- c. punctuated equilibria
- d. cladogenesis

*ANSWER:* a  
*REFERENCES:* 49  
*OTHER:* Factual  
*NOTES:* Pickup

95. Achromatopsia is a condition sometimes caused by founder effects. It is also known as:

- a. river blindness
- b. color-blindness
- c. light sensitivity
- d. filter defect

*ANSWER:* b  
*REFERENCES:* 45  
*OTHER:* Factual  
*NOTES:* New

96. Why is the genetic comparison between humans and chimpanzees sometimes misleading?

- a. It ignores qualitative differences between genomes.
- b. It ignores quantitative differences between genomes.
- c. It ignores individual differentiation within genomes.
- d. It attempts to explain all diversity through a simple comparison.

ANSWER: b

REFERENCES: 43

OTHER: Conceptual

NOTES: New

97. In a heterozygous individual, the dominance of one allele means that:

- a. the recessive allele has been lost or damaged
- b. the recessive allele was not copied during mitosis
- c. the recessive allele is not being expressed
- d. the recessive allele is skipping generations

ANSWER: c

REFERENCES: 42

OTHER: Conceptual

NOTES: New

98. When two or more genes contribute to the phenotypic expression of a single characteristic, it is known as:

- a. punctuated equilibrium
- b. polygenetic inheritance
- c. clinal expression
- d. genetic drift

ANSWER: b

REFERENCES: 42

OTHER: Factual

NOTES: New

99. Which of the following best describes a karyotype?

- a. It is the array of chromosomes found within a single cell.
- b. It is the sequence of amino acids expressed within a protein.
- c. It is a protein that directs chemical reactions.
- d. It is the complete structure of DNA for a species.

ANSWER: a

REFERENCES: 37

OTHER: Factual

NOTES: New

100. Compared to other chromosomes, the Y chromosome is:

- a. small and carries very little genetic information
- b. small and carries much more genetic information
- c. large and carries very little genetic information
- d. large and carries much more genetic information

ANSWER: a

*REFERENCES:* 38

*OTHER:* Conceptual

*NOTES:* New

### **Completion**

101. A group of like species is a \_\_\_\_\_.

*ANSWER:* genus

*REFERENCES:* 32

*OTHER:* Factual

*NOTES:* Pickup

102. The major organizing principle of biological science is \_\_\_\_\_.

*ANSWER:* evolution

*REFERENCES:* 31

*OTHER:* Factual

*NOTES:* Pickup

103. The smallest working units of biological classification systems are \_\_\_\_\_.

*ANSWER:* species

*REFERENCES:* 32

*OTHER:* Factual

*NOTES:* Pickup

104. The science of classification is called \_\_\_\_\_.

*ANSWER:* taxonomy

*REFERENCES:* 32

*OTHER:* Factual

*NOTES:* Pickup

105. Sir Charles Lyell proposed a nonreligious theory to account for variations in the earth's surface over extremely long periods of time. It is called \_\_\_\_\_.

*ANSWER:* catastrophism

*REFERENCES:* 33

*OTHER:* Factual

*NOTES:* New

106. The wings of a bird and those of the butterfly are considered \_\_\_\_\_ structures.

*ANSWER:* analogous

*REFERENCES:* 33

*OTHER:* Conceptual

*NOTES:* Modify

107. James Watson and Francis \_\_\_\_\_ discovered the existence of DNA in 1953.

*ANSWER:* Crick

*REFERENCES:* 36

*OTHER:* Factual  
*NOTES:* Pickup

108. Darwin's theory is properly known as the theory of \_\_\_\_\_.

*ANSWER:* natural selection

*REFERENCES:* 34

*OTHER:* Factual

*NOTES:* New

109. The Mendelian principle that variants of a gene retain their separate identities through generations is the law of \_\_\_\_\_.

*ANSWER:* segregation

*REFERENCES:* 36

*OTHER:* Factual

*NOTES:* New

110. A sequence of chemical bases on a molecule of DNA constitutes a recipe for making \_\_\_\_\_.

*ANSWER:* proteins

*REFERENCES:* 37

*OTHER:* Conceptual

*NOTES:* Pickup

111. The process of conversion of instructions from DNA to RNA is called \_\_\_\_\_.

*ANSWER:* transcription

*REFERENCES:* 37

*OTHER:* Factual

*NOTES:* New

112. Sister chromatids are when two copies of the original chromosome are joined in the shape of a(n) \_\_\_\_\_.

*ANSWER:* X

*REFERENCES:* 38

*OTHER:* Factual

*NOTES:* New

113. When a gene contains identical alleles it is referred to as being \_\_\_\_\_.

*ANSWER:* homozygous

*REFERENCES:* 42

*OTHER:* Factual

*NOTES:* New

114. In the A-B-O blood system, an individual with type O has an OO \_\_\_\_\_.

*ANSWER:* genotype

*REFERENCES:* 42

*OTHER:* Factual

*NOTES:* New

115. When neither allele is dominant, it is referred to as \_\_\_\_\_.

ANSWER: codominance

REFERENCES: 42

OTHER: Factual

NOTES: Pickup

116. The blood protein that carries oxygen is called \_\_\_\_\_.

ANSWER: hemoglobin

REFERENCES: 42

OTHER: Factual

NOTES: Pickup

117. The ultimate source of evolutionary change and all new genetic material is \_\_\_\_\_.

ANSWER: mutation

REFERENCES: 44

OTHER: Factual

NOTES: Modify

118. When an existing population splits up into two, the kind of genetic drift that occurs is called \_\_\_\_\_.

ANSWER: founder effects

REFERENCES: 45

OTHER: Conceptual

NOTES: Pickup

119. Adaptation is the outcome of \_\_\_\_\_.

ANSWER: natural selection

REFERENCES: 46

OTHER: Conceptual

NOTES: Pickup

120. Heterozygotes for sickle-cell anemia protect against \_\_\_\_\_.

ANSWER: malaria

REFERENCES: 47

OTHER: Factual

NOTES: Pickup

121. Anthropologists study biological diversity in terms of \_\_\_\_\_.

ANSWER: clines

REFERENCES: 48

OTHER: Conceptual

NOTES: Pickup

122. Sickle-cell anemia is caused by a mutation in the \_\_\_\_\_ protein.

ANSWER: hemoglobin

REFERENCES: 47



*OTHER:* Factual

*NOTES:* New

123. Factors that separate breeding populations and lead to the creation of new species are called \_\_\_\_\_ mechanisms.

*ANSWER:* isolating

*REFERENCES:* 49

*OTHER:* Factual

*NOTES:* New

124. The macroevolutionary model of change called \_\_\_\_\_ suggests that evolution occurs via long periods of stability and then periods of rapid change.

*ANSWER:* punctuated equilibrium

*REFERENCES:* 49

*OTHER:* Factual

*NOTES:* New

125. The four evolutionary forces are natural selection, gene flow, mutation, and \_\_\_\_\_.

*ANSWER:* genetic drift

*REFERENCES:* 44

*OTHER:* Factual

*NOTES:* New

### **Subjective Short Answer**

126. What criteria did Linnaeus use to establish his classificatory system?

*ANSWER:* Linnaeus based his classification on body structure, body function, and sequence of body growth.

*REFERENCES:* 32

*OTHER:* Factual

*NOTES:* Pickup

127. Distinguish analogies from homologies.

*ANSWER:* Analogies identify anatomical features of similar function across species, and homologies are structures possessed by two different organisms that arise in similar fashion and pass through similar stages during embryonic development but which have different functions.

*REFERENCES:* 32

*OTHER:* Factual

*NOTES:* Pickup

128. What distinguishes a creation story from the theory of evolution?

*ANSWER:* Evolution explains the diversity of life in a consistent scientific language using hypotheses.

*REFERENCES:* 31

*OTHER:* Conceptual

*NOTES:* New

129. Explain the theory of inheritance of acquired characteristics proposed by Jean-Baptiste Lamarck.

*ANSWER:* This theory argues that behavior brings about changes in organisms' forms.

REFERENCES: 33

OTHER: Factual

NOTES: New

130. Describe the theory of natural selection.

ANSWER: There exists natural variation and the capacity for population to exceed capacity; thus, there is a struggle for existence in which nature selects the most advantageous variations so that species can evolve.

REFERENCES: 34

OTHER: Conceptual

NOTES: Pickup

131. Define Mendel's "law of independent assortment."

ANSWER: This law states that genes controlling different traits are inherited independently of one another.

REFERENCES: 36

OTHER: Conceptual

NOTES: New

132. In genetics, what does the term *translation* mean?

ANSWER: It is the process of conversion of RNA instructions into proteins.

REFERENCES: 37

OTHER: Factual

NOTES: New

133. Briefly describe the process of protein synthesis and the involvement of codons.

ANSWER: In protein synthesis, a codon specifies production of a particular amino acid, and the directions are converted into RNA that travels to the ribosomes where anticodons of transfer RNA transport it to the corresponding mRNA codons. The amino acids are joined together by peptide bonds forming a new protein.

REFERENCES: 37

OTHER: Conceptual

NOTES: New

134. Distinguish between genotype and phenotype.

ANSWER: Genotype is the genetic composition for a trait, whereas the phenotype is the expressed physical characteristic.

REFERENCES: 42

OTHER: Conceptual

NOTES: Pickup

135. Define polygenetic inheritance, and give one example of it.

ANSWER: This is when there are multiple genes that control a physical trait, such as body build, skin color, or susceptibility to disease.

REFERENCES: 42

OTHER: Factual

NOTES: New

136. Genetic drift and gene flow can be easily confused because of the similarities in their names. What is the difference

between genetic drift and gene flow?

**ANSWER:** Genetic drift refers to chance fluctuations of allele frequencies of a population and can be seen in both founder's effect and population bottlenecks where a small group of people is isolated from a larger population and there is an increase in the expression of a certain gene. By contrast, gene flow refers to the introduction of alleles of one population into another. An example here would be an immigrant population who interbreeds with the existing population.

**REFERENCES:** 44-46

**OTHER:** Conceptual

**NOTES:** Pickup

137. Choose one kind of evolutionary force and explain it.

**ANSWER:** Students may choose and describe mutation, gene flow, genetic drift, or natural selection.

**REFERENCES:** 42-46

**OTHER:** Factual

**NOTES:** Modify

138. What are founder effects, and what can result from this?

**ANSWER:** Founder effects are a type of genetic drift that occurs when a small founding population, which does not possess all of the alleles present in the original population, breaks off. This can result in speciation.

**REFERENCES:** 45

**OTHER:** Conceptual

**NOTES:** New

139. What are some factors that increase the frequency of gene flow?

**ANSWER:** Interbreeding, migration, and geographical and social factors can increase gene flow.

**REFERENCES:** 46

**OTHER:** Conceptual

**NOTES:** Pickup

140. What is adaptation, and what is its role in natural selection?

**ANSWER:** Adaptation is a series of beneficial adjustments to the environment that can change the organism over time.

**REFERENCES:** 48

**OTHER:** Applied

**NOTES:** Pickup

141. What is sickle-cell anemia, and how is it adaptive?

**ANSWER:** This is a disease of misshapen red blood cells that clog the circulatory system. It is primarily carried by those of African ancestry who come from areas where malaria rates are high; carriers of sickle cells have an ability to better survive malaria.

**REFERENCES:** 47

**OTHER:** Conceptual

**NOTES:** Pickup

142. Describe some of the genetic variation that is most common to people native to colder regions of the world.

**ANSWER:** Individuals adapted to colder regions of the world tend to have bulkier bodies, a lower density of sweat glands, some circulatory system modifications, and shorter stature.

**REFERENCES:** 48

*OTHER:* Conceptual  
*NOTES:* Pickup

143. Compare and contrast cladogenesis with anagenesis.

*ANSWER:* Both are processes of speciation, but in cladogenesis, the original species branches out and separates, and in anagenesis, the original species itself changes over time into a new species.

*REFERENCES:* 49

*OTHER:* Conceptual

*NOTES:* Pickup

144. How does punctuated equilibrium differ from the Darwin model of gradual change over time?

*ANSWER:* Punctuated equilibrium is a model that argues that periods of stable change are occasionally punctuated by periods of rapid change.

*REFERENCES:* 49

*OTHER:* Conceptual

*NOTES:* New

### **Essay**

145. Creationism has changed shape over the past decade. Discuss some of the major disagreements between creationism and evolution. Has your study of evolution in this chapter changed your understanding of this debate?

*ANSWER:* will vary

*OTHER:* Conceptual

*NOTES:* Pickup

146. Although human populations are subject to the same laws of natural selection as other species, humans also have extensive and elaborate culture. Choose and discuss two examples of cultural processes that complicate simple environmental adaptation.

*ANSWER:* will vary

*OTHER:* Conceptual

*NOTES:* Pickup

147. Discuss protein synthesis and the various ways that biological variation can (and does) occur within the individual organism during this process.

*ANSWER:* will vary

*OTHER:* Conceptual

*NOTES:* New

148. Describe how each of the four evolutionary forces contributes to an organism's adaptation.

*ANSWER:* will vary

*OTHER:* Conceptual

*NOTES:* Pickup

149. How does speciation occur? Use examples and discuss the evolutionary processes that are involved.

*ANSWER:* will vary

*OTHER:* Conceptual

*NOTES:* New

