Chapter 2: Genetics: Cells and Molecules

Multiple Choice Questions

1. Cellular and molecular genetics involves the study of _____.

a. how species group themselves into populations
b. pedigrees of related individuals
c. the evolutionary relationships among species
d. cells and DNA

Correct Answer: d
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Moderate
Skill Level: Understand the Concepts

2. Scientists working on genetic therapies for disease are working in which genetic field?

a. phylogenetics
b. population genetics
c. Mendelian genetics
d. molecular genetics

Correct Answer: d
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Moderate
Skill Level: Apply What You Know

3. Classical or Mendelian genetics involves the study of _____.

a. pedigrees of related individuals
b. how populations are formed
c. cells and DNA
d. the evolutionary relationships among groups of species

Correct Answer: a
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Moderate
Skill Level: Understand the Concepts

4. Classical geneticists focus more on _____ than _____.

a. molecules; pedigrees
b. cells; populations
c. observable traits; molecular variation
d. populations; observable traits

Correct Answer: c
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Moderate
Skill Level: Apply What You Know

5. A geneticist tracking how various observable traits are passed from one generation to the next is engaged in _____.

a. phylogenetics
b. population genetics
c. Mendelian genetics
d. molecular genetics

Correct Answer: c
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Easy
Skill Level: Understand the Concepts

6. Population genetics involves the study of _____.

a. pedigrees of related individuals
b. how individuals vary within and between populations
c. the transmission of observable traits
d. cells and DNA

Correct Answer: b
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Easy
Skill Level: Understand the Concepts

7. A geneticist studying the variation between different groups of organisms of the same species is engaged in _____.

a. phylogenetics
b. population genetics
c. Mendelian genetics
d. behavioral genetics

Correct Answer: b
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Easy
Skill Level: Understand the Concepts

8. The genetic field of phylogenetics is concerned with _____.

a. determining evolutionary relationships between species
b. studying varying groups within the same species
c. constructing pedigrees
d. comparing individual variation

Correct Answer: a
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Moderate
Skill Level: Understand the Concepts

9. A geneticist constructing tree-like diagrams that visually indicate relationships between species is engaged in _____.

a. behavioral genetics
b. molecular genetics
c. phylogenetics
d. population genetics

Correct Answer: c
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Easy
Skill Level: Understand the Concepts

10. Behavioral genetics is the study of how _____.

a. behavior influences genetics
b. pedigrees are influenced by genetic relationships
c. phylogenies affect behavior
d. genetics influence behavior

Correct Answer: d
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Moderate
Skill Level: Understand the Concepts

11. Why is behavioral genetics considered a controversial field?

a. Behavior is complex and may be the product of more than just the underlying genetics.
b. An observable link between behavior and genes is impossible to observe.
c. Behaviors are not consistent from one generation to the next and are not controlled by genetics.
d. Behaviors are only influenced by the immediate environment.

Correct Answer: a
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Difficult
Skill Level: Apply What You Know

12. Human biological variability arises from _____.

a. only genetics
b. only the environment
c. a combination of genes and the environment
d. learning

Correct Answer: c
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Moderate
Skill Level: Understand the Concepts

13. Why does biological anthropology include the study of genetics?

a. because DNA is only found in humans
b. because biological anthropology is concerned with the evolution of humans in all aspects
c. because genetics indicates whether the environment is playing a role on evolution
d. because the study of human evolution can only be performed using a genetic perspective

Correct Answer: b
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Difficult
Skill Level: Apply What You Know

14. The basic building block of life is the _____.

a. cell
b. gene
c. homunculus
d. organism

Correct Answer: a
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Easy
Skill Level: Remember the Facts

15. Which of the following is an example of a multicellular organism?

a. bacteria
b. protozoa
c. a worm
d. archaea

Correct Answer: c
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Apply What You Know

16. The marine sea slug is commonly studied because it possesses _____ cells compared to other multi-cellular organisms.

a. larger
b. colored
c. more
d. fewer

Correct Answer: d
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Easy
Skill Level: Understand the Concepts

17. Which of the following is true of prokaryotes?

a. they are single-celled organisms
b. they have membrane-bound organelles
c. they do not have ribosomes
d. they have a nucleus

Correct Answer: a
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Easy
Skill Level: Understand the Concepts

18. A single-celled organism with a nucleus is an example of a _____.

a. prokaryote
b. eukaryote
c. organelle
d. protein

Correct Answer: b
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Easy
Skill Level: Understand the Concepts

19. In eukaryotes, the organelle that separates the genetic material from the rest of the cell is called the _____.

a. nucleus
b. cytoplasm
c. nucleoid
d. plasma membrane

Correct Answer: a
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Easy
Skill Level: Understand the Concepts

20. A cell's plasma membrane _____.

a. separates the genetic material from the rest of the cell
b. is a fluid-filled space within a cell
c. contains a number of structures essential to cellular function
d. regulates the transport of material into and out of a cell

Correct Answer: d
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Understand the Concepts

21. The _____ contains organelles.

a. prokaryote
b. nucleus
c. cytoplasm
d. plasma membrane

Correct Answer: c
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Easy
Skill Level: Understand the Concepts

22. The first eukaryotes appear in the fossil record around _____ years ago.

a. 3.4 billion
b. 1.5 billion
c. 850 million
d. 600 million

Correct Answer: b
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Remember the Facts

23. The first prokaryotic cells appear in the fossil record _____ years ago.

a. 3.4 billion
b. 1.5 billion
c. 800 million
d. 100 million

Correct Answer: a
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Remember the Facts

24. Which of the following best describes somatic cells?

a. they are sex cells
b. they have the same function as gametes
c. they are cells of the body that are not gametes
d. they only exist in prokaryotic organisms

Correct Answer: c
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Easy
Skill Level: Understand the Concepts

25. Tissues are comprised of _____.

a. somatic cells
b. stem cells
c. gametes
d. RNA

Correct Answer: a
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Understand the Concepts

26. _____ are directly involved in reproduction.

a. Somatic cells
b. Gametes
c. Stem cells
d. Organelles

Correct Answer: b
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Easy
Skill Level: Understand the Concepts

27. Embryonic _____ may be helpful in curing cellular disorders, such as Parkinson's disease.

a. gametes
b. somatic cells
c. germ cells
d. stem cells

Correct Answer: d
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Understand the Concepts

28. Which of the following can be found within the nucleus of a eukaryotic cell?

a. mitochondria
b. ribosomes
c. RNA
d. glucose

Correct Answer: c
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Easy
Skill Level: Understand the Concepts

29. What does *totipotent* refer to when discussing stem cells?

a. the ability to pass through the plasma membrane
b. the ability to clone oneself
c. having limited mobility
d. the ability to differentiate into multiple cell types

Correct Answer: d
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Difficult
Skill Level: Understand the Concepts

30. In most eukaryotic cells, the most prominent structure is the _____.

a. nucleus
b. mitochondria
c. ribosomes
d. DNA

Correct Answer: a
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Understand the Concepts

31. RNA is essential for carrying out the _____ function of DNA.

a. cell replication
b. energy production
c. cytoplasmic
d. protein synthesis

Correct Answer: d
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Easy
Skill Level: Understand the Concepts

32. The two main functions of DNA are _____.

a. protein synthesis and cell reproduction
b. protein synthesis and ATP production
c. ATP production and cell reproduction
d. there is only one function of DNA, which is protein synthesis

Correct Answer: a
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Understand the Concepts

33. Which of the following organelles is responsible for the production of ATP?

a. the nucleus
b. the endoplasmic reticulum
c. mitochondria
d. ribosomes

Correct Answer: c
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Understand the Concepts

34. Ribosomes appear as little knobs on the _____.

a. nucleus
b. mitochondria
c. cytoplasm
d. endoplasmic reticulum

Correct Answer: d
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Understand the Concepts

35. Proteins are synthesized at a cell's _____.

a. RNA
b. nucleus
c. mitochondria
d. ribosomes

Correct Answer: d
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Understand the Concepts

36. Some of the oldest preserved cell anatomy can be found in _____.

a. dinosaur eggs
b. tree rings
c. insects in amber
d. stromatolite fossils

Correct Answer: d
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Easy
Skill Level: Understand the Concepts

37. DNA has to be able to do three things. What are they?

a. replicate, create ATP, and synthesize proteins
b. coordinate the activity of proteins, make the cell's energy, and self-replicate
c. replicate, make proteins, and coordinate the activity of proteins
d. create ATP, transfer proteins, and replicate

Correct Answer: c
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Understand the Concepts

38. The basic unit of DNA is a molecule called a _____.

a. nucleotide
b. base
c. thymine
d. prokaryotic cell

Correct Answer: a
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Easy
Skill Level: Remember the Facts

39. A nucleotide consists of three parts, including _____.

a. a phosphate, a sugar, and a ribosome
b. a sugar, a phosphate, and a base
c. a phosphate, a base, and a nucleus
d. a sugar, a base, and an ATP particle

Correct Answer: b
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Remember the Facts

40. Which of the following are the four bases in a DNA molecule?

a. cytosine, guanine, thymine, adenine
b. adenine, thymine, guanine, purine
c. purine, pyrimidine, adenine, thymine
d. adenine, purine, pyrimidine, cytosine

Correct Answer: a
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Understand the Concepts

41. In DNA, _____ bond to _____.

a. sugars, purines
b. thymines, pyrimidines
c. phosphates, uracil
d. sugars, phosphates

Correct Answer: d
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Understand the Concepts

42. DNA base combinations are always _____.

a. A-T or C-G
b. A-G or C-T
c. G-T or A-C
d. A-A or G-G

Correct Answer: a
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Apply What You Know

43. Which of the following bases is found only in RNA?

a. thymine
b. uracil
c. guanine
d. adenine

Correct Answer: b
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Understand the Concepts

44. Hormones, antibodies, and hemoglobin are all examples of _____.

a. enzymes
b. amino acids
c. catalysts
d. proteins

Correct Answer: d
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Easy
Skill Level: Understand the Concepts

45. Proteins are comprised of long chains of _____.

a. hormones
b. amino acids
c. hemoglobin
d. enzymes

Correct Answer: b
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Easy
Skill Level: Understand the Concepts

46. The base-pair sequence of DNA is known as _____.

a. a polypeptide
b. a hormone
c. the genetic code
d. an amino acid

Correct Answer: c
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Remember the Facts

47. The genetic code is comprised of _____, each representing _____.

a. amino acids; polypeptides
b. codons; genes
c. polypeptides; genes
d. codons; amino acids

Correct Answer: d
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Difficult
Skill Level: Understand the Concepts

48. Which of the following structures is the smallest?
a. a gene
b. a codon
c. an organelle
d. a cell

Correct Answer: b
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Apply What You Know

49. Which of the following best defines a gene?

a. a three-base code for an amino acid
b. a three-base code for a polypeptide
c. a multiple-codon code for an amino acid
d. a multiple-codon code for a polypeptide

Correct Answer: d
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Difficult
Skill Level: Understand the Concepts

50. Protein synthesis is a two-step process involving what two steps?

a. transcription and replication
b. replication and translation
c. transcription and translation
d. mutation and replication

Correct Answer: c
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Easy
Skill Level: Understand the Concepts

51. Transcription occurs in the _____.

a. cytoplasm
b. ribosome
c. messenger RNA
d. nucleus

Correct Answer: d
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Easy
Skill Level: Understand the Concepts

52. What does mRNA do?

a. It carries genetic information from the nucleus to the ribosome.
b. It splits a DNA molecule into two halves during transcription.
c. It is completely replicated during translation.
d. It carries amino acids to a ribosome to be attached to other amino acids.

Correct Answer: a
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Understand the Concepts

53. What does tRNA do?

a. It carries genetic information from the nucleus to the cytoplasm.
b. It splits a DNA molecule into two halves during transcription.
c. It is completely replicated.
d. It carries amino acids to a ribosome to be attached to other amino acids to create a protein.

Correct Answer: d
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Understand the Concepts

54. Most of the time, DNA is in its chromatin state. That is to say, it is _____.

a. coiled into chromosomes
b. tightly packed
c. in its diploid state
d. existing in uncoiled strands

Correct Answer: d
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Understand the Concepts

55. During cell division, the DNA exists _____.

a. as chromosomes
b. in its chromatin state
c. outside the cell
d. as RNA

Correct Answer: a
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Understand the Concepts

56. Which of the following best defines the term *allele*?

a. a sex cell
b. the location of a gene on a chromosome
c. the state of the DNA before replication
d. a version of a gene

Correct Answer: d
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Easy
Skill Level: Understand the Concepts

57. An individual who is homozygous for a gene has _____.

a. different alleles for the gene
b. no alleles for that gene
c. two of the same alleles for that gene
d. only one locus for that particular gene

Correct Answer: c
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Understand the Concepts

58. Two identical daughter cells result from which process?

a. mitosis
b. translation
c. mutation
d. meiosis

Correct Answer: a
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Easy
Skill Level: Understand the Concepts

59. Complete diploid daughter cells at each end of the cell exist directly following which phase of the cell cycle?

a. anaphase
b. metaphase
c. interphase
d. telophase

Correct Answer: a
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Understand the Concepts

60. During the first meiotic prophase, the genes are shuffled between chromosomes in a process called _____.

a. crossing over
b. recombination
c. interphase
d. meiotic division

Correct Answer: a
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Easy
Skill Level: Understand the Concepts

True/False Questions

61. The term "gene" was coined after DNA was observed.

a. True
b. False

Correct Answer: b
Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Difficult
Skill Level: Remember the Facts

62. Prokaryotes are simple cells with only a nucleus but no organelles.

a. True
b. False

Correct Answer: b
Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Understand the Concepts

63. Deoxyribonucleic acid has one main function: protein synthesis.

a. True
b. False

Correct Answer: b
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Easy
Skill Level: Understand the Concepts

64. Mitochondria have their own DNA separate from that within the cell's nucleus.

a. True
b. False

Correct Answer: a
Learning Objective: LO 2.4: Define ancient DNA, mitochondrial DNA, and the polymerase chain reaction.
Topic: Molecular Tools for Bioanthropological Research
Difficulty Level: Moderate
Skill Level: Understand the Concepts

65. mRNA post-transcriptional processing involves the mRNA losing exons and keeping introns.

a. True
b. False

Correct Answer: b
Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Easy
Skill Level: Understand the Concepts

Essays

66. Explain the various types of genetic study outlined in your text.

Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Moderate
Skill Level: Understand the Concepts

67. Outline the "blueprint" and "recipe" metaphors for genetics. What are the strengths and weaknesses of each?

Learning Objective: LO 2.1: Recognize how genetics can be studied at different biological levels and describe each of those levels.
Topic: Genetics
Difficulty Level: Difficult
Skill Level: Understand the Concepts

68. What are stem cells? Explain their medical significance.

Learning Objective: LO 2.2: Understand how the cell is the basic unit of life on Earth, and be able to label the components of a generic cell.
Topic: The Cell
Difficulty Level: Moderate
Skill Level: Apply What You Know

69. Describe the structure of DNA. Relate this structure to DNA's functions.

Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Apply What You Know

70. Describe specifically how proteins are created from the information encoded in DNA. Be sure to use the terms *gene, mRNA,* and *ribosome*.

Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Difficult
Skill Level: Understand the Concepts

71. Outline the life cycle of a somatic cell from prophase to interphase.

Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Understand the Concepts

72. In what ways does meiosis differ from mitosis? Name at least two differences.

Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure
Difficulty Level: Moderate
Skill Level: Apply What You Know

73. How does meiosis contribute to variation within a species?

Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Apply What You Know

74. Describe two chromosomal abnormalities, one due to monosomy and one due to trisomy.

Learning Objective: LO 2.3: Compare and contrast: DNA/RNA, translation/transcription, base/codon, genes/chromosomes, and mitosis/meiosis.
Topic: DNA Structure and Function
Difficulty Level: Moderate
Skill Level: Understand the Concepts

75. Explain two ways DNA may be directly used in bioanthropological research.

Learning Objective: LO 2.4: Define ancient DNA, mitochondrial DNA, and the polymerase chain reaction.
Topic: Molecular Tools for Bioanthropological Research
Difficulty Level: Moderate
Skill Level: Understand the Concepts