

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