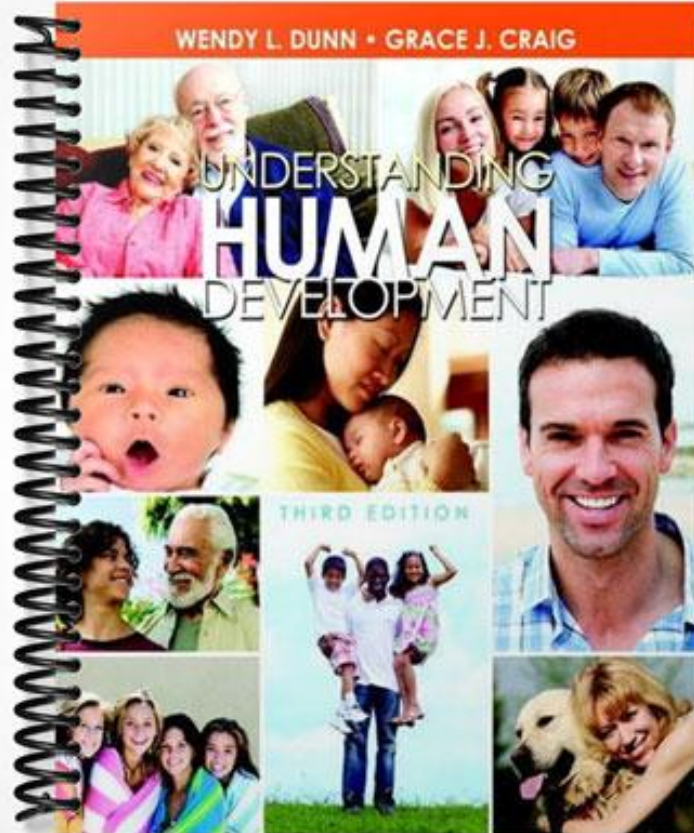


# TEST BANK

WENDY L. DUNN • GRACE J. CRAIG



Name \_\_\_\_\_

## Chapter 2 - Heredity and Environment - Quick Quiz 1

### *Factual questions:*

1. If you were to compare the DNA of any two unrelated people, about what percent of their DNA would be identical?
  - a. 25%
  - b. 50%
  - c. 99.9%
  - d. 100%
2. Which of the following disorders occurs only when the gene involved is inherited from the mother and not the father?
  - a. Prader-Willi syndrome
  - b. Angelman syndrome
  - c. Fragile X syndrome
  - d. Down syndrome
3. Operant conditioning is especially likely to be involved in the development of:
  - a. phobias
  - b. excessive salivation
  - c. habituation
  - d. habits

### *Conceptual questions:*

4. Suppose that a human female is accidentally exposed to a poison at one of four different points in development. If the effect of the poison is that it interferes with meiosis, at which point in the lifespan would we expect it to have the most disruptive effect?
  - a. in the prenatal period, since this is when ova are forming
  - b. in the first year after birth, since this is when brain growth is most rapid
  - c. during early adulthood, since this is when conception of a child is most likely to happen
  - d. in older adulthood, since body cells are most vulnerable at the end of the lifespan
5. If different members of the family experience quite different environments, this would be reflected in:
  - a. a larger shared environment
  - b. a larger nonshared environment
  - c. a harsher developmental niche
  - d. a challenge for self-concept development
6. Which of the following is MOST likely to be experienced as a normative influence?
  - a. retirement
  - b. career change
  - c. illness
  - d. moving to a new community

### *Applied questions:*

7. Suppose that a disease is inherited. Your mother has the disease, your father does not, and you have a very minor case of the disease which lies somewhere in between your mother's and father's situation. In this case, we would know that the alleles that determine this trait:
  - a. are recessive
  - b. are dominant
  - c. are codominant

d. are heterozygous

8. Workers in Dr. Garcia's lab first obtain tumor cells from patients with cancer. They then remove the DNA from the tumor cell nuclei and use enzymes to segment the DNA strands into sections. Finally, they insert the DNA sections in which they are interested into "host" bacteria cells, where the DNA can be reproduced for later use. Dr. Garcia's lab is engaged in work involving:

- a. behavior genetics
- b. recombinant technology
- c. cryogenics
- d. autosomal transmission

9. Dr. Smith studies a group of 1,000 people who have schizophrenia and who also have identical twins. He finds that 47% of the identical twins also develop this disease. The type of statistical information Dr. Smith's study reveals is called:

- a. concordance
- b. an H-E (Heredity-Environment) Index
- c. a genetic-based percentage
- d. analysis of variance

10. Patty doesn't want to hang around with people from the other side of town because she says they are "weird." Patty's behavior best reflects the concept involved in:

- a. ethnocentrism
- b. self-efficacy
- c. normative age-graded influences
- d. normative history-graded influences

Name \_\_\_\_\_

## Chapter 2 - Heredity and Environment - Quick Quiz 2

### *Factual questions:*

1. The term used to describe alternate versions of the same gene is:
  - a. alleles
  - b. chromosomes
  - c. autosomes
  - d. gametes
2. The extent to which a trait is inherited versus acquired through interactions with the environment defines the concept of:
  - a. heritability
  - b. genetic predisposition
  - c. genetic engineering
  - d. concordance
3. The tendency to assume that one's own cultural beliefs are normal and those of others are abnormal is referred to as:
  - a. cohesion
  - b. socialization
  - c. ethnocentrism
  - d. indoctrination

### *Conceptual questions:*

4. Color blindness is a sex-linked trait. As such, if a child is color blind, we can be assured that the child's genotype includes:
  - a. a recessive gene on the X chromosome inherited from his mother
  - b. a dominant gene on the X chromosome inherited from his mother
  - c. a recessive gene on the Y chromosome inherited from his father
  - d. a dominant gene on the X chromosome inherited from his father
5. Which of the following syndromes occurs only in females?
  - a. Down syndrome
  - b. Turner's syndrome
  - c. Klinefelter's syndrome
  - d. Fragile X syndrome
6. The key to understanding how classical conditioning works is to recognize that it involves the \_\_\_\_\_ of what will come.
  - a. reinforcement
  - b. punishment
  - c. prediction
  - d. repression

### *Applied questions:*

7. Anne mentions that her cousin has a congenital anomaly. You would know that this is sometimes also referred to as:
  - a. a sex-linked trait
  - b. a birth defect
  - c. an autosomal disorder

d. a heterozygous trait

8. Olaf has been diagnosed with Klinefelter's syndrome. What is his chromosomal pattern?

- a. XO
- b. XY
- c. XXY
- d. XYY

9. While sitting in a quiet waiting room, Ronnie at first is quite distracted by the clicking sound made by an old clock ticking away the seconds. However, after a few minutes, he no longer notices the ticking. This example best highlights the concept involved in:

- a. concordance
- b. classical conditioning
- c. habituation
- c. social learning

10. Many individuals who grew up during the Great Depression were so devastated by the collapse of the economy that they became distrustful of depositing large sums of money in banks. The Great Depression would best be considered a:

- a. normative, age-graded influence
- b. normative, history-graded influence
- c. nonnormative influence
- d. normative, economic-graded influence

## **Quick Quiz Answers**

### ***Quick Quiz 2.1***

1. c, p. 37
2. a, p. 47
3. d, pp. 54-55
4. a, p. 40
5. b, p. 57
6. a, p. 59
7. c, p. 41
8. b, p. 50
9. a, p. 51
10. a, p. 57

### ***Quick Quiz 2.2***

1. a, p. 40
2. a, p. 51
3. c, p. 57
4. a, pp. 41, 45
5. b, pp. 44-46
6. c, p. 54
7. b, p. 44
8. c, p. 45
9. c, p. 54
10. b, p. 59

## Chapter 2 Heredity and Environment

- 2.1: Where in our cells are genetic instructions located and how are these instructions encoded in our DNA?
- 2.2: How do we inherit traits from our parents, and how are those traits expressed?
- 2.3: How can environmental forces modify genetic instructions?
- 2.4: What kinds of disorders are caused by problems in how genes are inherited and expressed?
- 2.5: What techniques are available to help individuals deal with genetic disorders?
- 2.6: Why is the study of behavior genetics important in helping us understand gene-environment interactions?
- 2.7: Why are adopted children and twins of special interest to those who study behavior genetics?
- 2.8: How do environmental events exert their influence on developmental processes?
- 2.9: How do one's family and culture help shape the way that development unfolds?

### Multiple Choice questions

#### *Molecular Genetics*

- 2.1. According to the text, the human body contains about how many different types of cells?
  - a. 16
  - b. 50
  - c. 200
  - d. several thousand

Answer: c

Page: 35

Learning Objective 2.1

Factual

Moderate

- 2.2. Which of the following parts of the cell provides most of its energy?
  - a. Golgi bodies
  - b. mitochondria
  - c. cytoplasm
  - d. the nucleus

Answer: b

Page: 35

Learning Objective 2.1

Factual  
Easy

- 2.3. If a researcher wanted to extract the DNA from a cell, she should look for it in the cell's:
- nucleus
  - mitochondria
  - cytoplasm
  - cell membrane

Answer: a  
Page: 35  
Learning Objective 2.1  
Applied  
Moderate

Rationale: The cell's nucleus, which also is surrounded by a porous membrane, contains most of the deoxyribonucleic acid (DNA), which contains the genetic instructions that direct growth and development.

- 2.4. In building a house, carpenters look for instructions on a blueprint, which includes all of the information needed to construct the house. Comparing a house to a human cell, the part of the cell that contains the "blueprint" would be:
- the Golgi bodies
  - the cell membrane
  - the mitochondria
  - the nucleus

Answer: d  
Page: 35  
Learning Objective 2.1  
Applied  
Moderate

Rationale: The cell's nucleus, which also is surrounded by a porous membrane, contains most of the deoxyribonucleic acid (DNA), which contains the genetic instructions that direct growth and development.

- 2.5. DNA refers to:
- di-nucleic antibody
  - duonucleic acid
  - deoxyribonucleic acid
  - dynonucleic antigen

Answer: c  
Page: 35  
Learning Objective 2.1  
Factual  
Easy

- 2.6. The structure of DNA consists of a long molecule that looks somewhat like a ladder that has been "twisted." The shape of the DNA molecule is referred to as:
- the double rope
  - the twisted rope
  - the double helix
  - the Golgi apparatus

Answer: c  
Page: 36  
Learning Objective 2.1  
Conceptual



Moderate

Rationale: DNA is a highly complex macromolecule: It is made up of many smaller molecules that are arranged in the shape of a twisted ladder called a double helix.

- 2.7. Which of the following statements about DNA is true?
- a. The DNA molecule is circular, with the nucleotide bases located in the center of the circle.
  - b. The DNA molecule contains only four different types of bases, regardless of what species is involved.
  - c. The DNA molecule is identical for every known species, and species differences are coded on molecules that lay alongside the DNA.
  - d. The pairing of adenine, thymine, cytosine, and guanine follows a random sequence, with all four base pairs combining with each other an equal percentage of times.

Answer: b

Page: 36-37

Learning Objective 2.1

Conceptual

Difficult

Rationale: The DNA molecule is elegant in that, regardless of the species, it contains only four types of bases: adenine (A), thymine (T), cytosine (C), and guanine (G).

- 2.8. Which of the following is NOT contained in a nucleotide?
- a. a base molecule
  - b. an enzyme
  - c. a phosphate molecule
  - d. a sugar molecule

Answer: b

Page: 36

Learning Objective 2.1

Factual

Moderate

- 2.9. Suppose you get into an argument about how similar humans and chimpanzees are. One point to consider is that these species share about \_\_\_\_ % of their genes.
- a. 50
  - b. 65
  - c. 85
  - d. 98

Answer: d

Page: 37

Learning Objective 2.1

Applied

Moderate

Rationale: We share about 98% of our genes with chimpanzees; between two unrelated humans, there is only one tenth of 1% difference in the genes.

- 2.10. If you were to compare the DNA of any two unrelated people, about what percent of their DNA would be identical?
- a. 25%
  - b. 50%
  - c. 99.9%
  - d. 100%

Answer: c

Page: 37

Learning Objective 2.1  
Conceptual  
Moderate

2.11. Which of the following is NOT one of the ways by which nucleotide bases determine the specific traits contained in the genetic code?

- a. which side of the ladder the base is on
- b. the order in which the base pairs are arranged on the ladder
- c. the total number of base pairs on the ladder
- d. whether adenine combines with thymine, cytosine, or guanine in the particular DNA strand

Answer: d  
Page: 36-37  
Learning Objective 2.1  
Factual  
Difficult

2.12. According to research presented in the text, the genetic locations that are responsible for determining a person's race:

- a. are located on chromosome number 18
- b. are located on the X chromosome
- c. are located on many genes, including those in chromosomes 18, 19, and 20
- d. are probably unique to each individual, and therefore "race" is not a meaningful concept in a genetic sense

Answer: d  
Page: 37-38  
Learning Objective 2.1  
Factual  
Moderate

2.13. The text suggests that, from a genetic point of view, the concept of race is:

- a. very important, since there are many genes in the human genome that determine specific race-related traits (such as hair color and eyelid shape)
- b. largely meaningless, and a better way of thinking about race differences is to consider them as cultural or ethnic differences
- c. very important, since in humans there are only a handful of genes that code for "race" in our DNA (each corresponding to a difference racial group)
- d. of some importance, since genes that code for racial characteristics also code for intelligence

Answer: b  
Page: 37-38  
Learning Objective 2.1  
Conceptual  
Difficult

Rationale: The concept of race is often used to categorize people into groups but this categorization becomes largely meaningless when considered from a genetic reference point. Although genes do control the development of characteristics frequently associated with race (e.g., skin color, eye shape, hair color and texture), these traits do not occur as "either-or" features; rather, they are distributed continuously throughout the human population.

2.14. Dr. Johnson corrects a student who talks about "genetic racial differences" and suggests that a better term to use when talking about genetic differences among defined groups of people would be:

- a. ethnicity
- b. genetic physical differences
- c. nucleotide disparities among individuals
- d. shared genes

Answer: a

Page: 37-38

Learning Objective 2.1

Applied

Difficult

Rationale: The usage of the term race should be questioned if it suggests that an individual belongs to a genetically defined group. A more appropriate term in a context such as this is ethnicity, which avoids the genetic connotation that race often mistakenly implies and focuses instead on the shared cultural experiences of groups that define their members as similar.

- 2.15. A gene is best defined as:
- a nucleotide
  - a nucleotide base pair
  - a specific segment of DNA
  - all of the DNA contained on a specific chromosome

Answer: c

Page: 38

Learning Objective 2.1

Factual

Moderate

- 2.16. Current estimates note that the human genome contains about how many genes?
- about 5,000
  - about 25,000
  - about 85,000
  - over a million

Answer: b

Page: 38

Learning Objective 2.1

Factual

Easy

- 2.17. Compared to earlier estimates about the total number of genes in the human genome, it now appears that there are:
- about 10 times more genes than previously thought
  - about twice as many genes as previously thought
  - about the same number of genes as was predicted by Watson and Crick in 1954
  - somewhat fewer genes than previously thought

Answer: d

Page: 38

Learning Objective 2.1

Factual

Moderate

- 2.18. A single human gene is composed of about how many base pairs?
- anywhere from one to several dozen
  - anywhere from several dozen to 100
  - anywhere from 100 to 1000
  - anywhere from several hundred to several million

Answer: d

Page: 38

Learning Objective 2.1

Factual

Moderate

- 2.19. According to the text, the most significant thing that genes do is:
- a. determine how the brain will be constructed
  - b. build proteins
  - c. keep the organism alive by regulating physiological processes
  - d. produce sperm and ova so organisms can reproduce

Answer: b

Page: 38

Learning Objective 2.1

Factual

Moderate

- 2.20. About how many different proteins have been identified in the human body?
- a. 200
  - b. 2,000
  - c. 20,000
  - d. 200,000

Answer: d

Page: 38

Learning Objective 2.1

Factual

Difficult

- 2.21. Protecting the body from disease is the primary function of this type of protein:
- a. collagen
  - b. antibody
  - c. enzyme
  - d. insulin

Answer: b

Page: 38

Learning Objective 2.1

Factual

Difficult

***Genes, Chromosomes, and Cell Division***

- 2.22. How many PAIRS of chromosomes are in a normal human liver cell?
- a. 12
  - b. 23
  - c. 46
  - d. 92

Answer: b

Page: 39

Learning Objective 2.2

Conceptual

Easy

Rationale: In normal humans, all cells except sperm and eggs contain exactly 46 chromosomes arranged in 23 pairs.

- 2.23. The chromosomes of a cell, excluding those that determine sex, are called:

- a. gametes
- b. alleles
- c. autosomes
- d. enzymes

Answer: c

Page: 39

Learning Objective 2.2

Factual

Easy

2.24. Sarah states, "All normal human skin cells contain 46 genes." To make Sarah's statement correct, you would need to:

- a. change the word "genes" to "chromosomes"
- b. change the word "skin" to "blood"
- c. change the number "46" to "23"
- d. make all of the changes noted in the other three answer choices

Answer: a

Page: 39

Learning Objective 2.2

Applied

Moderate

Rationale: In normal humans, all cells except sperm and eggs contain exactly 46 chromosomes arranged in 23 pairs.

2.25. Julie and David are excited because Julie has undergone some prenatal testing and today they will see a picture of their unborn baby's chromosomes. Such a picture is called:

- a. a genetic blueprint
- b. a karyotype
- c. a nucleotide
- d. an autosomal map

Answer: b

Page: 39

Learning Objective 2.2

Applied

Moderate

Rationale: A karyotype is a photograph of a cell's chromosomes arranged in pairs according to size.

2.26. A photograph of a cell's chromosomes arranged in pairs according to size is referred to as a:

- a. phenotype
- b. karyotype
- c. chromotype
- d. genotype

Answer: b

Page: 39

Learning Objective 2.2

Factual

Moderate

2.27. The two ways in which cells can divide are called:

- a. meiosis and mitosis
- b. autosomes and gametes
- c. gametes and polarization
- d. genotype and phenotype

Answer: a  
Page: 39-40  
Learning Objective 2.2  
Factual  
Easy

- 2.28. The type of cell division that occurs in autosomes is called:
- a. mutation
  - b. codominant reproduction
  - c. meiosis
  - d. mitosis

Answer: d  
Page: 39  
Learning Objective 2.2  
Factual  
Easy

- 2.29. Which chromosomal pair determines the sex of an individual?
- a. 19th
  - b. 20th
  - c. 22nd
  - d. 23rd

Answer: d  
Page: 40  
Learning Objective 2.2  
Conceptual  
Moderate

Rationale: The 23rd chromosome pair is composed of sex chromosomes, which are labeled XX in females and XY in males.

- 2.30. If you were to examine a variety of human body cells under the microscope and look at the number of chromosomes contained in each, you would expect to see 46 chromosomes in all of the following cells EXCEPT:
- a. a sperm cell
  - b. a liver cell
  - c. a neuron
  - d. a white blood cell

Answer: a  
Page: 40  
Learning Objective 2.2  
Applied  
Moderate

Rationale: In normal humans, all cells except sperm and eggs contain exactly 46 chromosomes arranged in 23 pairs.

- 2.31. Sperm and egg cells are called:
- a. autosomes
  - b. genosomes
  - c. gametes
  - d. Golgi bodies

Answer: c  
Page: 40  
Learning Objective 2.2

Factual  
Easy

- 2.32. Thomas (a man) knows that in his body, meiosis occurs in:
- only his brain
  - only his white blood cells
  - only his testes
  - every cell in his body

Answer: c  
Page: 40  
Learning Objective 2.2  
Applied  
Easy

Rationale: Meiosis is the process of cell division that yields sperm and ova, each including one half of a full set of chromosomes. In males, meiosis occurs in the testis.

- 2.33. Suppose that a human female is accidentally exposed to a poison at one of four different points in development. If the effect of the poison is that it interferes with meiosis, at which point in the lifespan would we expect it to have the most disruptive effect?
- in the prenatal period, since this is when ova are forming
  - in the first year after birth, since this is when brain growth is most rapid
  - during early adulthood, since this is when conception of a child is most likely to happen
  - in older adulthood, since body cells are most vulnerable at the end of the lifespan

Answer: a  
Page: 40  
Learning Objective 2.2  
Conceptual  
Difficult

Rationale: Meiosis in females begins in the ovaries well before birth, where all of the roughly 400,000 ova a woman will ever have begin their development. The final cell division that produces the ovum does not occur until the female enters puberty. The most disruptive effect would be in the prenatal period, since interference at this stage would inhibit ova from even beginning to form.

- 2.34. In women, ova are formed:
- about one every day after reaching puberty
  - about one or two a month, every month after reaching puberty
  - about 100 every day after reaching puberty
  - during the prenatal period

Answer: d  
Page: 40  
Learning Objective 2.2  
Factual  
Moderate

- 2.35. Which of the following results from the process of meiosis?
- fertilized ovum
  - alleles
  - gametes
  - proteins

Answer: c  
Page: 40  
Learning Objective 2.2

Factual  
Moderate

- 2.36. Another term used to refer to either ova or sperm is:
- a. alleles
  - b. gametes
  - c. phenotypes
  - d. proteins

Answer: b  
Page: 40  
Learning Objective 2.2  
Factual  
Easy

- 2.37. The cell division process that results in the formation of gametes is called:
- a. meiosis
  - b. gene imprinting
  - c. transcription
  - d. mitosis

Answer: a  
Page: 40  
Learning Objective 2.2  
Factual  
Moderate

- 2.38. The term used to describe alternate versions of the same gene is:
- a. alleles
  - b. chromosomes
  - c. autosomes
  - d. gametes

Answer: a  
Page: 40  
Learning Objective 2.2  
Factual  
Easy

- 2.39. The term that refers to an individual's genetic make-up is \_\_\_\_\_; the term that refers to the physical characteristics that result from that genetic make-up is \_\_\_\_\_:
- a. autosomes; gametes
  - b. gametes; autosomes
  - c. phenotype; genotype
  - d. genotype; phenotype

Answer: d  
Page: 40  
Learning Objective 2.2  
Factual  
Moderate

- 2.40. Suppose that the gene that determines how many fingers a person has is coded such that having 5 fingers is dominant and having 6 fingers is recessive. If a person's mother has 5 fingers and his father has 6 fingers, what is the probability that he will be born with 6 fingers?
- a. 0 %



- b. 50 %
- c. 100 %
- d. the percent cannot be determined because we do not know if his mother is homozygous or heterozygous for this trait

Answer: d

Page: 40

Learning Objective 2.2

Applied

Difficult

Rationale: Normally, recessive traits are only expressed when a person has inherited two recessive genes. In this example, if the person's mother is heterozygous for the trait, then the person would have a 50% chance of being born with 6 fingers. In this case, the father would contribute the recessive gene and there would be a 50% chance that the mother would contribute the recessive gene. As a result, there would be an overall 50% chance that the person would inherit both recessive genes and be born with 6 fingers. However, if the mother is homozygous for the trait, she will contribute the dominant gene which, even when combined with the recessive gene from the father, would never result in the presentation of the recessive trait of having 6 fingers. Thus, determining a precise probability would require that we know whether the mother is heterozygous or homozygous for the trait.

- 2.41. If the gene for blue eyes is recessive, and if John's mother and father both have blue eyes, we know that John:
- a. will be homozygous on the eye color trait
  - b. will be heterozygous on the eye color trait
  - c. will have a 50% chance of having blue eyes
  - d. will have a 25% chance of having blue eyes

Answer: a

Page: 40

Learning Objective 2.2

Applied

Moderate

Rationale: Normally, recessive traits are only expressed when a person has inherited two recessive genes. In this example, one should assume that both the mother and father, having blue eyes, have two recessive genes. It follows that each would have had to contribute a recessive gene, resulting in John being homozygous on the eye color trait.

- 2.42. Suppose that Shelly's mother has brown eyes and her father has blue eyes. Shelly has brown eyes. In this example we would \_\_\_\_\_ Shelly's phenotype for eye color and would \_\_\_\_\_ Shelly's genotype for eye color.
- a. know; not know
  - b. not know; know
  - c. know; know
  - d. not know; not know

Answer: c

Page: 40

Learning Objective 2.2

Applied

Difficult

Rationale: In genetics, the phenotype refers to those traits that are expressed in the individual. Thus, we know the phenotype: Shelly has brown eyes. The genotype refers to the genetic code of a given individual. Because the gene for brown eyes is dominant, Shelly would have brown eyes whether she inherited a recessive gene from her father and a dominant gene from her mother or whether she inherited dominant genes from both parents. Thus, we cannot determine Shelly's genotype from the information provided.

- 2.43. Suppose that hair color is a single-gene trait and that dark hair is dominant and blonde hair is recessive. Also, suppose that Terry's mother has dark hair and his father has blonde hair. If Terry has blonde hair, we would \_\_\_\_\_ Terry's phenotype for hair color and would \_\_\_\_\_ Terry's genotype for hair color.
- a. know; not know

- b. not know; know
- c. know; know
- d. not know; not know

Answer: c

Page: 40

Learning Objective 2.2

Applied

Difficult

Rationale: In genetics, the phenotype refers to those traits that are expressed in the individual. Thus, we know the phenotype: Terry has blonde hair. The genotype refers to the genetic code of a given individual. Because blonde hair is recessive, we can determine Terry's genotype: he would have to have inherited recessive genes from both his parents.

- 2.44. Suppose that eye color is a single gene trait and that brown eyes is a dominant allele and blue eyes is a recessive allele. If Mark has brown eyes, we would know:
- a. that Mark is heterozygous for the eye color trait
  - b. that Mark is homozygous for the eye color trait
  - c. Mark's genotype
  - d. Mark's phenotype

Answer: d

Page: 40

Learning Objective 2.2

Applied

Moderate

Rationale: In genetics, the phenotype refers to those traits that are expressed in the individual. Thus, we know the phenotype: Mark has brown eyes.

- 2.45. Assume that eye color is a single gene trait and that brown eyes is a dominant allele and blue eyes is a recessive allele. If Harry's mother and father both have brown eyes and are both heterozygous on this trait, what is the probably that he will have brown eyes, too?
- a. 100%
  - b. 75%
  - c. 50%
  - c. 25%

Answer: b

Page: 40

Learning Objective 2.2

Applied

Difficult

Rationale: Heterozygous refers to the arrangement in which the two alleles for a simple dominant–recessive trait differ. One possibility is that Harry could inherit a recessive allele from his father and a recessive allele from his mother, which would result in blue eyes. Alternatively, he could inherit a recessive allele from his father and a dominant allele from his mother, a dominant allele from his father and a recessive allele from his mother, or dominant alleles from both parents – all circumstances that would result in Harry having brown eyes.

- 2.46. A mother and a father have four children (biological not adopted). All four children have blue eyes. Assuming that brown eyes is a dominant trait and blue eyes is a recessive trait, which of the following statements must be true?
- a. The parents may have brown or blue eyes, but both must have at least one allele for blue eyes.
  - b. The parents may have brown or blue eyes, but both must have at least one allele for brown eyes.
  - c. At least one of the parents must have blue eyes.
  - d. Both of the parents must have blue eyes.

Answer: a

Page: 40

Learning Objective 2.2

Applied

Difficult

Rationale: For a recessive trait to be expressed, a child must inherit two recessive alleles. Thus, for a child to have blue eyes, both parents must have at least one recessive allele (i.e., allele for blue eyes).

2.47. The term “polygenic inheritance” refers to which of the following?

- a. a trait that is determined by a single gene pair
- b. the idea that half of our genes come from each of our parents
- c. a trait that is present in the individual’s phenotype
- d. a trait caused by an interaction of several genes or gene pairs

Answer: d

Page: 41

Learning Objective 2.2

Conceptual

Easy

Rationale: In polygenic inheritance, the inheritance of a trait is determined by multiple genes.

2.48. Dr. Ramley states that intelligence is determined by the action of hundreds of different genes. She has just defined intelligence as a \_\_\_\_\_ trait.

- a. dominant
- b. recessive
- c. polygenic
- d. heterozygous

Answer: c

Page: 41

Learning Objective 2.2

Applied

Moderate

Rationale: Polygenic inheritance is defined as the inheritance of a trait that is determined by multiple genes.

2.49. Color blindness is a sex-linked trait. As such, if a child is color blind, we can be assured that the child’s genotype includes:

- a. a recessive gene on the X chromosome inherited from his mother
- b. a dominant gene on the X chromosome inherited from his mother
- c. a recessive gene on the Y chromosome inherited from his father
- d. a dominant gene on the X chromosome inherited from his father

Answer: a

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Learning Objective 2.2

Conceptual

Difficult

Rationale: Sex-linked traits are those that are determined by genes on the 23rd chromosome pair. If a normally recessive allele appears on the male’s X chromosome, there often is no allele on the Y chromosome to offset it, and the recessive trait will be expressed as the individual’s phenotype. In contrast, in females, the recessive trait will be expressed only if it occurs on both X chromosomes. Regardless of whether the child is male or female, the mother must contribute a recessive gene on the X chromosome in order for the trait to be expressed.

2.50. Sickle-cell anemia is a genetic disorder that is best considered an example of:

- a. dominance

- b. incomplete dominance
- c. recessive alleles
- d. codominance

Answer: b

Page: 41

Learning Objective 2.2

Factual

Difficult

2.51. The AB blood type is an example of a condition that results from:

- a. dominance
- b. incomplete dominance
- c. recessive alleles
- d. codominance

Answer: d

Page: 41

Learning Objective 2.2

Factual

Difficult

2.52. Suppose that a disease is inherited. Your mother has the disease, your father does not, and you have a very minor case of the disease which lies somewhere in between your mother's and father's situation. In this case, we would know that the alleles that determine this trait:

- a. are recessive
- b. are dominant
- c. are codominant
- d. are heterozygous

Answer: c

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Learning Objective 2.2

Applied

Difficult

Rationale: Codominance refers to a situation in which neither allele is dominant over the other. When codominant traits are inherited, the result is a phenotype that is a blend.

2.53. An example of a trait that results from incomplete dominance is \_\_\_\_\_; a trait that results from codominant alleles is \_\_\_\_\_:

- a. sickle-cell anemia; blood type
- b. leukemia; breast cancer
- c. heart disease; liver cancer
- d. multiple sclerosis; Lou Gehrig's disease

Answer: a

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Learning Objective 2.2

Factual

Difficult

2.54. The blood clotting disease, hemophilia, occurs much more frequently in males because it is caused by a recessive gene carried on the sex chromosomes. As such, it would be referred to as:

- a. a heterozygous trait
- b. a homozygous trait
- c. a sex-linked trait

d. a codominant trait

Answer: c

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Learning Objective 2.2

Applied

Moderate

Rationale: Sex-linked traits are, by definition, those that are determined by genes on the 23rd chromosome pair (the sex chromosomes). Sex-linked traits are not, by definition, heterozygous or homozygous. If a normally recessive allele appears on the male's X chromosome, there often is no allele on the Y chromosome to offset it, and the recessive trait will be expressed as the individual's phenotype. In contrast, in females, the recessive trait will be expressed only if it occurs on both X chromosomes.

2.55. Sometimes in meiosis, genetic material from the mother and father is exchanged between chromosomes. This process is called \_\_\_\_\_ and the alleles that carry the combination of both parents' genes are called \_\_\_\_\_ alleles.

- a. phenotypic inheritance; phenotypic
- b. polygenetic inheritance; independent
- c. incomplete dominance; codominant
- d. crossing over; recombinant

Answer: d

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Learning Objective 2.2

Factual

Moderate

2.56. The last stage of meiotic division, in which chance determines which half of each chromosome pair will go into which sperm or ovum, involves the process called:

- a. mitosis
- b. independent assortment
- c. recombination
- d. codominant configuration

Answer: b

Page: 41-42

Learning Objective 2.2

Factual

Difficult

2.57. Mr. Martin is worried that, if he has a child, the child might be "unlucky" and get the "bad half" of his chromosome pairs. Mr. Martin's worry would technically be referred to as an issue involving:

- a. recombinant alleles
- b. independent assortment
- c. codominance in allele pairs
- c. mutation

Answer: b

Page: 41-42

Learning Objective 2.2

Applied

Difficult

Rationale: Independent assortment refers to the final stage of meiotic division, in which chance determines which half of the chromosome pairs will go into which sperm or ovum.

2.58. If all cells in a person's body have a particular mutation present, we can conclude that the mutation most likely occurred:

- a. during mitosis
- b. during meiosis
- c. shortly after birth
- d. sometime after puberty

Answer: b

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Learning Objective 2.2

Conceptual

Difficult

Rationale: At the molecular level, a mutation is an alteration in the DNA that typically occurs during mitosis or meiosis. A small number of mutations are viable—the mutated cell survives. In mitotic cell division, if a viable mutation occurs early in development, it will then be passed along to all the cells replicated in subsequent divisions of that cell. When mutation occurs during meiosis, on the other hand, it is incorporated into the genetic code passed along to offspring in the sperm or ova. ***Genetic and Chromosomal Disorders***

2.59. According to the text, genetic mutations are:

- a. extremely rare, occurring only in about 0.1% of the population.
- b. found only in individuals who are over the age of 4 since do not begin to occur until some development has taken place.
- c. always negative, in that they always make it more difficult for the individual to survive.
- d. quite common.

Answer: d

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Learning Objective 2.3

Factual

Moderate

2.60. Dr. Gage argues that hereditary and environmental forces can never be understood separately, since they are continually influencing each other. This statement is best considered to reflect the concept of:

- a. independent assortment
- b. gene-environment interactions
- c. recombinant processes
- d. polygenetic inheritance

Answer: b

Page: 43

Learning Objective 2.3

Applied

Moderate

Rationale: The central concept of gene-environment interactions is that genetic and environmental forces are in constant interaction with each other: genes influence the environments we select and environmental events can influence how genes are expressed.

2.61. About what percent of the DNA molecule is made up of protein-coding genes:

- a. about 2%
- b. about 25%
- c. about 60%
- d. nearly 100%

Answer: a

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Learning Objective 2.3

Factual

Moderate

2.62. The part of the DNA molecule that does not function as genes, but that can influence how genes work is referred to as \_\_\_\_

- a. polygenetic forces
- b. recombinant processes
- c. epigenetic forces
- d. meta-genetic forces

Answer: c

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Learning Objective 2.3

Factual

Moderate

2.63. Andre explains that early malnutrition – an environmental condition – actually may change the way that genes express themselves. In other words, starvation turns some genes “off” and others “on,” thereby influencing genetic processes. The central argument that Andre is making emphasizes the basic idea of:

- a. epigenetics
- b. polygenic inheritance
- c. incomplete dominance
- d. recombinant processes

Answer: a

Page: 43

Learning Objective 2.3

Conceptual

Rationale: Epigenetics refers to the idea that nongenetic factors can change the way that genes are expressed. Here, malnutrition is an environmental condition that influences these epigenetic processes, which in turn influence how genes behave.

2.64. What percent of babies born today in the United States are healthy and normal?

- a. 60%
- b. 73%
- c. 87%
- d. 97%

Answer: d

Page: 44

Learning Objective 2.4

Factual

Moderate

2.65. Anne mentions that her cousin has a congenital anomaly. You would know that this is sometimes also referred to as:

- a. a sex-linked trait
- b. a birth defect
- c. an autosomal disorder
- d. a heterozygous trait

Answer: b

Page: 44

Learning Objective 2.4

Applied

Easy

Rationale: Congenital anomalies are abnormalities that result from genetic and chromosomal problems as well as from exposure to toxins, disease, and such during the prenatal period. These anomalies are still often referred to as birth defects.

2.66. Which of the following is NOT a sex-linked disorder?

- a. Down syndrome
- b. hemophilia
- c. Fragile X syndrome
- d. color blindness

Answer: a

Page: 44-45

Learning Objective 2.4

Factual

Easy

2.67. Which of the following sex-linked disorders occurs most frequently?

- a. Klinefelter's syndrome
- b. Turner's syndrome
- c. hemophilia
- d. color blindness

Answer: d

Page: 44-45

Learning Objective 2.4

Factual

Moderate

2.68. Which of the following inherited disorders results in problems with blood clotting?

- a. Klinefelter's syndrome
- b. Turner's syndrome
- c. hemophilia
- d. color blindness

Answer: c

Page: 45

Learning Objective 2.4

Factual

Easy

2.69. Which of the following syndromes occurs only in females?

- a. Down syndrome
- b. Turner's syndrome
- c. Klinefelter's syndrome
- d. Fragile X syndrome

Answer: b

Page: 45

Learning Objective 2.4

Conceptual

Moderate

Rationale: Both Down syndrome and Fragile X occur in both males and females. Klinefelter's syndrome appears in only males. Turner's syndrome appears in only females and occurs when one of the X chromosomes is missing or inactive.



- 2.70. Todd is mentally retarded, sterile, and has small external genitalia, undescended testicles, and breast enlargement. His chromosome pattern is XXY. Since puberty, he has received hormone replacement therapy in order to maintain his secondary-sex characteristics. What sex-linked abnormality does Todd most likely have?
- Klinefelter's syndrome
  - Down syndrome
  - Turner's syndrome
  - Fragile X syndrome

Answer: a

Page: 45

Learning Objective 2.4

Applied

Moderate

Rationale: Klinefelter's syndrome occurs in about 1 of 1,000 males and involves the characteristics described: sterility, small external genitalia, undescended testicles, and breast enlargement.

- 2.71. Olaf has been diagnosed with Klinefelter's syndrome. What is his chromosomal pattern?
- XO
  - XY
  - XXY
  - XYY

Answer: c

Page: 45

Learning Objective 2.4

Applied

Moderate

Rationale: Klinefelter's syndrome can result from any of the following chromosomal patterns: XXY, XXXY, XXXXY

- 2.72. Which of the following conditions is a sex-linked abnormality that can occur in both males and females?
- Fragile X syndrome
  - Klinefelter's syndrome
  - Turner's syndrome
  - Down syndrome

Answer: a

Page: 45

Learning Objective 2.4

Conceptual

Moderate

Rationale: Klinefelter's syndrome occurs only in males and Turner's syndrome occurs only in females. Down syndrome can occur in both males and females, but results from a variation on the 21st chromosome pair rather than on the 23rd chromosome pair (i.e., sex chromosomes).

- 2.73. Individuals with this syndrome have a functional X chromosome, but either a missing or inactive second X chromosome.
- Klinefelter's syndrome
  - Fragile X syndrome
  - Down syndrome
  - Turner's syndrome

Answer: d

Page: 45

Learning Objective 2.4

Factual

Moderate

2.74. Melissa has a single X chromosome and no Y chromosome, an immature female appearance, and lacks internal reproductive organs. What is the most appropriate diagnosis of her condition?

- a. Down syndrome
- b. Turner's syndrome
- c. Fragile X syndrome
- d. Klinefelter's syndrome

Answer: b

Page: 45

Learning Objective 2.4

Applied

Moderate

Rationale: Turner syndrome occurs in about 1 of 10,000 females. One of the X chromosomes is either missing or inactive. The characteristics of Turner syndrome match Melissa's: Individuals with Turner syndrome usually have an immature female appearance—they do not develop secondary sex characteristics. They also lack internal reproductive organs. These females may be abnormally short, and some are mentally retarded. The disorder is usually discovered at puberty, and hormone replacement therapy can help with a more normal appearance.

2.75. Andre is a hemophiliac, which means that he has problems with:

- a. blood clotting
- b. exocrine glands
- c. amino acid metabolism
- d. muscle control

Answer: a

Page: 45

Learning Objective 2.4

Applied

Easy

Rationale: Hemophilia A and B are disorders that interfere with normal blood clotting and occur at different loci on the X chromosome. Hemophilia A is usually accompanied by color blindness.

2.76. If Margaret (a woman) is becoming bald as the result of a genetic trait called pattern baldness, we would know that she inherited a \_\_\_\_\_ allele for this trait from her mother and a \_\_\_\_\_ allele from her father:

- a. dominant; recessive
- b. recessive; dominant
- c. dominant; dominant
- d. recessive; recessive

Answer: d

Page: 44-45

Learning Objective 2.4

Applied

Moderate

Rationale: Pattern baldness, which can include a receding hairline, loss of hair on the top of the head, or overall hair thinning, is a common example of a sex-linked disorder. Many men inherit the recessive allele and some display pattern baldness as early as in their teens. Many women carry the recessive allele as well, but a dominant allele on the other X chromosome prevents pattern baldness from being displayed. Unless a woman inherits a recessive allele from both parents, she is unlikely to display this genetic trait.

2.77. The primary reason that sex-linked traits are observed more frequently in men than in women is that:

- a. mutations are much more common in male offspring
- b. male babies are weaker so are more likely to be spontaneously aborted if any developmental process is compromised

- c. the Y chromosome is much smaller and has fewer genes than the X chromosome
- d. women generally do not talk about sex-related behavior as much as do men

Answer: c

Page: 44-45

Learning Objective 2.4

Conceptual

Moderate

Rationale: Sex-linked traits are, by definition, those that are determined by genes on the 23rd chromosome pair (the sex chromosomes). If a normally recessive allele appears on the male's X chromosome, there often is no allele on the Y chromosome to offset it, and the recessive trait will be expressed as the individual's phenotype. In contrast, in females, the recessive trait will be expressed only if it occurs on both X chromosomes. Because a trait will be expressed in males when two recessive alleles are inherited or when a recessive allele is inherited from the mother and no allele appears on the Y chromosome to offset it, sex-linked traits are more frequently observed in men than in women.

- 2.78. If we know that a disease results from a sex-linked recessive trait, we would expect that it would:
- a. be more common among men than women
  - b. be more common among women than men
  - c. develop earlier in life for boys than girls
  - d. develop earlier in life for girls than boys

Answer: a

Page: 44-45

Learning Objective 2.4

Conceptual

Difficult

Rationale: Traits that are controlled by the sex chromosomes (X and Y) are called sex-linked traits. Because the males' Y chromosome is smaller than the females' second X, men are more likely to display recessive sex-linked traits in their phenotype.

- 2.79. Having an African-American ancestry puts individuals at higher risk for developing which of the following genetic disorders?
- a. sickle-cell trait and sickle-cell anemia
  - b. cystic fibrosis
  - c. Tay-Sachs disease
  - d. Down syndrome

Answer: a

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Learning Objective 2.4

Conceptual

Moderate

Rationale: Sickle-cell trait occurs in about 1 of 12 U.S. African Americans; sickle-cell anemia occurs in about 1 of 500. Other groups whose ancestors lived in low-lying malarial wetlands show high rates as well.

- 2.80. Which recessive genetic disorder occurs primarily among people of European Ashkenazi Jewish ancestry, resulting in early death in those children afflicted with it?
- a. cystic fibrosis
  - b. Tay-Sachs disease
  - c. phenylketonuria
  - d. sickle-cell anemia

Answer: b

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Learning Objective 2.4

Factual  
Easy

2.81. At birth, Debbie was given a mandatory screening test and tested positive for a disorder that required her to be placed immediately on a restricted diet to control her symptoms. Which of the following is mostly likely the condition for which she is being treated?

- a. sickle-cell anemia
- b. Huntington's disease
- c. cystic fibrosis
- d. phenylketonuria

Answer: d  
Page: 46  
Learning Objective 2.4  
Applied  
Difficult

2.82. Which of the following disorders occurs only when the gene involved is inherited from the mother and not the father?

- a. Prader-Willi syndrome
- b. Angelman syndrome
- c. Fragile X syndrome
- d. Down syndrome

Answer: a  
Page: 46-47  
Learning Objective 2.4  
Factual  
Difficult

2.83. If a child has mutated genes on chromosome 15 contributed by the mother, he or she will be at risk for developing \_\_\_\_; if the mutated genes are from the father, he or she will be at risk for developing \_\_\_\_.

- a. Angelman syndrome; Prader-Willi syndrome
- b. Prader-Willi syndrome; Angelman syndrome
- c. Turner's syndrome; Klinefelter's syndrome
- d. Klinefelter's syndrome; Turner's syndrome

Answer: b  
Page: 46-47  
Learning Objective 2.4  
Factual  
Moderate

2.84. Rene has Down syndrome, which means that she has an extra chromosome on which chromosome pair?

- a. the 7th pair
- b. the 18th pair
- c. the 21st pair
- d. the 23rd pair

Answer: c  
Page: 46-47  
Learning Objective 2.4  
Applied  
Easy

Rationale: As noted in the textbook, the most frequent type of Down syndrome is trisomy-21, in which an extra chromosome is attached to the 21st pair.

- 2.85. Which of the following genetic disorders is the result from a problem associated with the autosomes?
- Fragile X syndrome
  - Turner's syndrome
  - Klinefelter's syndrome
  - Down syndrome

Answer: d

Page: 45-47

Learning Objective 2.4

Conceptual

Moderate

Rationale: Fragile X syndrome, Turner's syndrome, and Klinefelter's syndrome are all sex-linked disorders. Down syndrome is not a sex-linked disorder, rather it involves an extra chromosome being attached to the 21st pair.

- 2.86. Down syndrome has been shown to be related to which of the following?
- father's age
  - mother's age
  - parents' ethnic background
  - mother's diet during pregnancy

Answer: b

Page: 46

Learning Objective 2.4

Conceptual

Moderate

Rationale: As noted in the textbook, Down syndrome occurs about once in every 1,000 live births for mothers under age 35, and the incidence steadily increases as the age of the mother increases.

- 2.87. George's younger brother is diagnosed at birth with "trisomy-21." Another term for this condition is:
- Klinefelter's syndrome
  - Supermale syndrome
  - Fragile X syndrome
  - Down syndrome

Answer: d

Page: 46

Learning Objective 2.4

Applied

Easy

Rationale: As noted in the textbook, The most frequent type of Down syndrome is trisomy-21, in which an extra chromosome is attached to the 21st pair.

- 2.88. Suppose researchers identify a genetic disorder that has negative consequences if the gene is inherited from the mother, but no consequences at all if it is inherited from the father. According to the text, this situation would be:
- impossible
  - an example of gene imprinting
  - an example of a sex-linked trait
  - an example of an autosomal disorder

Answer: b

Page: 47

Learning Objective 2.4

Applied

Difficult

Rationale: Gene imprinting refers to a phenomenon in which gene expression and phenotype depend on which parent the genes come from.

- 2.89. Although most of an individual's DNA is contained in the cell nucleus, some is also contained in the:
- ribosomes
  - mitochondria
  - endoplasmic reticulum
  - cell membrane

Answer: b

Page: 47

Learning Objective 2.4

Factual

Easy

- 2.90. What percent of mitochondrial DNA is inherited from the mother:
- it varies from individual to individual
  - 100% of the child is female; 50% of the child is male
  - 100% if the child is male; 50% if the child is female
  - 100% for both male and female children

Answer: d

Page: 47-48

Learning Objective 2.4

Factual

Moderate

- 2.91. According to the text, most individuals harbor about \_\_\_\_\_ potentially lethal recessive genes:
- none or 1
  - 5 to 8
  - 50 to 75
  - hundreds

Answer: b

Page: 48

Learning Objective 2.4

Factual

Difficult

- 2.92. In his professional career, Andy wants to study the risk factors associated with genetic disorders and to provide information and support to parents whose risk factors are high. Andy wants to enter the field called:
- genetic counseling
  - pediatric social work
  - prenatology
  - bioethical statistics

Answer: a

Page: 48

Learning Objective 2.5

Applied

Easy

Rationale: Genetic counseling refers to a widely available resource that can help potential parents evaluate genetic risk factors in childbearing and enable them to make choices that reflect their values and circumstances.

- 2.93. Which of the following types of information would be of LEAST interest to a genetic counselor?
- parents' ages

- b. parents' illnesses
- c. parents' ethnic background
- d. parents' income

Answer: d

Page: 48

Learning Objective 2.5

Applied

Moderate

Rationale: Genetic counseling often includes the analysis of parental medical records and family histories to construct a genetic "pedigree," which identifies previous instances where congenital anomalies have occurred. Other techniques, such as parental blood analysis or prenatal screening, can detect many chromosomal or genetic anomalies. Parents' income does not provide information in helping the counselor construct a person's genetic "pedigree."

2.94. Workers in Dr. Garcia's lab first obtain tumor cells from patients with cancer. They then remove the DNA from the tumor cell nuclei and use enzymes to segment the DNA strands into sections. Finally, they insert the DNA sections in which they are interested into "host" bacteria cells, where the DNA can be reproduced for later use. Dr. Garcia's lab is engaged in work involving:

- a. behavior genetics
- b. recombinant technology
- c. cryogenics
- d. autosomal transmission

Answer: b

Page: 50

Learning Objective 2.5

Applied

Moderate

Rationale: As defined in the textbook, recombinant DNA technology refers to an assortment of highly sophisticated procedures in which DNA is extracted from cell nuclei and cut into segments; the resulting fragments are then joined to self-replicating elements, in essence forming functional gene clones. These are then placed in host bacterial cells to be maintained and cultured.

2.95. Which of the following is the best summary of the current state of gene therapies, such as the use of retroviruses?

- a. The theoretical work about how such processes might work is still incomplete.
- b. Gene therapies have been developed but ethical concerns have prevented their use in humans at the present time.
- c. Gene therapies have been developed and tried, but with limited success so far.
- d. Gene therapies are used routinely with very good success in treating a number of genetic diseases.

Answer: c

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Learning Objective 2.5

Conceptual

Moderate

Rationale: As noted in the textbook, a gene therapy approach that involves reinserting genetically altered cells into the person from whom they were harvested has been tried with various genetic disorders but with limited success thus far. Additionally, the retrovirus approach also has experienced only limited success; however, it holds great promise for the future if certain technical obstacles can be overcome.

2.96. Viruses used in gene therapy that are capable of penetrating cells and inserting modified DNA into them are called:

- a. recombinant viruses
- b. re-engineered viruses

- c. retroviruses
- d. macroviruses

Answer: c  
Page: 50  
Learning Objective 2.5  
Factual  
Moderate

### ***Behavior Genetics***

- 2.97. The field of behavior genetics relies most heavily on data gathered from:
- a. chromosomes
  - b. diseased tissue
  - c. psychological tests and interviews
  - d. viruses

Answer: c  
Page: 51  
Learning Objective 2.6  
Factual  
Moderate

- 2.98. If it were possible to know exactly what genetic information was contained in an individual's genes, would the field of behavioral genetics have any usefulness?
- a. No
  - b. Yes, because some genes are recessive
  - c. Yes, because some traits are polygenic
  - d. Yes, because the way traits are expressed is often dependent on the environment

Answer: d  
Page: 51  
Learning Objective 2.6  
Conceptual  
Moderate

Rationale: Even if we had complete knowledge of an individual's genome, this would provide only a partial explanation for how that person's traits would be expressed within an interactive environmental context. Understanding how genetic characteristics operate within particular environmental settings is the focus of behavior genetics.

- 2.99. The extent to which biologically related people show similar characteristics is measured by a technique called:
- a. genetic engineering
  - b. recombinant technology
  - c. concordance
  - d. behavioral genetics

Answer: c  
Page: 51  
Learning Objective 2.6  
Factual  
Moderate

- 2.100. Dr. Smith studies a group of 1,000 people who have schizophrenia and who also have identical twins. He finds that 47% of the identical twins also develop this disease. The type of statistical information Dr. Smith's study reveals is called:
- a. concordance



- b. an H-E (Heredity-Environment) Index
- c. a genetic-based percentage
- d. analysis of variance

Answer: a

Page: 51

Learning Objective 2.6

Applied

Moderate

Rationale: The primary tool of behavior genetics is the statistical technique of correlation, which measures concordance: the extent to which biologically related people show similar characteristics.

- 2.101. Doug believes that a person's intelligence is about half inherited and half dependent on how the person grows up. Doug's statement best reflects a concept that researchers would call:
- a. codominance
  - b. a genetic predisposition
  - c. heritability
  - d. a heterozygous trait

Answer: c

Page: 51

Learning Objective 2.6

Applied

Moderate

Rationale: Heritability is the proportion of a trait, such as intelligence, that is thought to result from inherited, genetic factors.

- 2.102. The extent to which a trait is inherited versus acquired through interactions with the environment defines the concept of:
- a. heritability
  - b. genetic predisposition
  - c. genetic engineering
  - d. concordance

Answer: a

Page: 51

Learning Objective 2.6

Factual

Easy

- 2.103. If a particular trait is highly heritable, we would expect to see the highest concordance rates among:
- a. identical twins
  - b. fraternal twins
  - c. parents and children
  - d. unrelated individuals of the same age

Answer: a

Page: 51

Learning Objective 2.7

Conceptual

Easy

Rationale: Heritability refers to the extent to which a trait is inherited versus acquired, thus presuming a genetic basis. In this example, the trait is highly heritable, so we presume a strong genetic basis. Because identical twins are genetically identical (share 100% of their genetic makeup) we would expect them to show the most similar characteristics.

- 2.104. If the heritability of a trait was .50, we would expect to see the highest concordance rates among:
- identical twins raised together in the same home
  - identical twins raised in different homes
  - fraternal twins raised in different homes
  - unrelated individuals

Answer: a

Page: 51

Learning Objective 2.6

Conceptual

Moderate

Rationale: Concordance refers to the extent to which biologically related people show similar characteristics. A heritability of .50 suggests that genetics and environment contribute relatively equally to the expression of the trait. Thus, the individuals who share both the highest genetic makeup and share an environment would be expected to show the most similar characteristics.

- 2.105. If the heritability of a trait is greater than 0 but less than 100%, this would mean that:
- heredity was a larger influence on the trait than environment
  - environment was a larger influence on the trait than heredity
  - both heredity and environment influence the trait
  - heredity and environment do not interact in their influence on this trait

Answer: c

Page: 51

Learning Objective 2.7

Conceptual

Moderate

Rationale: Heritability refers to the proportion of a trait, such as intelligence, that is thought to result from inherited, genetic factors. A proportion less than 100% but more than zero would indicate that there is some genetic basis to the trait, the remainder of which is explained by environmental factors.

- 2.106. Which of the following results is consistent with a trait that has a high heritability?
- identical twins are less alike than fraternal twins
  - adopted children resemble their biological parents more than their adoptive parents
  - unrelated children are as much alike as are brothers and sisters
  - brothers are more alike than are sisters

Answer: b

Page: 51

Learning Objective 2.7

Conceptual

Difficult

Rationale: Heritability refers to the proportion of a trait, such as intelligence, that is thought to result from inherited, genetic factors. If a trait is highly heritable, we would expect persons who are more genetically similar to one another to show more similarity on a trait than persons who are less genetically similar to one another. In this example, adopted children share more genes with their biological parents than with their adoptive parents, so should resemble the biological parents more.

- 2.107. Based on the heritability studies cited in the text, the appropriate conclusion to draw is that:
- genes are important in physical development, but not in cognitive and personality development
  - genes are important in physical and cognitive development but not in personality development
  - genes play only a minor role in human development, regardless of the domain in question
  - genes play a significant role in human development of a wide range of human traits and behaviors

Answer: d

Page: 51-53

Learning Objective 2.7

Conceptual

Moderate

Rationale: Overall the research presented in the book indicates that genes play a significant role across a variety of traits and behaviors. For example, the book mentions a recent meta-analytic study of over 400 individual studies of the heritability of traits—including intelligence, language ability, psychiatric disorders including anxiety and depression, personality traits, and antisocial problems—that suggests that 41% of human behavior is genetically influenced (Malouff, Rooke, & Schutte, 2008).

2.108. According to research presented in the text, you should conclude that, under normal circumstances, about what percent of a person's intelligence is the result of environmental, rather than genetic, factors?

- a. nearly 100%
- b. about half
- c. a small but measurable percent
- d. virtually zero percent

Answer: b

Page: 51

Learning Objective 2.7

Conceptual

Moderate

Rationale: According to the text, looking across a variety of studies, a consistent estimate is that genetics contributes about 50% to intelligence.

2.109. Research suggests that a portion of intelligence is inherited. What percentage of an individual's intelligence is generally believed to be due to inherited factors?

- a. 10% or less
- b. around 50%
- c. around 75%
- d. over 90%

Answer: b

Page: 51

Learning Objective 2.7

Factual

Moderate

2.110. According to research presented in the text, you should conclude that, under normal circumstances, about what percent of a person's personality is the result of genetic factors?

- a. nearly 100%
- b. about a third to a half
- c. about 2 to 5%
- d. virtually zero percent

Answer: b

Page: 52

Learning Objective 2.7

Conceptual

Moderate

Rationale: Studies estimate a genetic contribution to personality of about 40% (Bouchard, 1999), perhaps ranging from 20 to 50% depending on the situation (Rushton, Bons, & Hur, 2008; Segal, 2000).

***Environmental Influences and Contexts***

2.111. The technique that allows researchers to consider the results of several similar studies while weighing the quality of each is called:

- a. analysis of variance
- b. meta-analysis
- c. epigenetic analysis
- d. multiple regression analysis

Answer: b

Page: 52

Learning Objective 2.7

Factual

Moderate

2.112. While sitting in a quiet waiting room, Ronnie at first is quite distracted by the clicking sound made by an old clock ticking away the seconds. However, after a few minutes, he no longer notices the ticking. This example best highlights the concept involved in:

- a. concordance
- b. classical conditioning
- c. habituation
- d. social learning

Answer: c

Page: 54

Learning Objective 2.8

Applied

Moderate

Rationale: In habituation, a person ceases to attend or respond to repetitive stimulation.

2.113. A researcher records the number of “sucks” a baby takes on her pacifier as she is shown pictures of adult faces. The researcher notes that when her mother’s face is shown, the baby stops sucking entirely. This experimental method relies most directly on an understanding of which of the following learning processes?

- a. habituation
- b. operant conditioning
- c. reinforcement
- d. self-efficacy

Answer: a

Page: 54

Learning Objective 2.8

Applied

Difficult

Rationale: In habituation, a person ceases to attend or respond to repetitive stimulation. In this case, the researcher knows that the baby demonstrates habituation to the mother’s face because the face is familiar (in other words, it is an example of repetitive stimulation).

2.114. While taking a test, suppose you are distracted by the student next to you who is smacking her gum as she chews it. However, after a few minutes, you no longer attend to the smacking, even though your neighbor keeps doing this. Your response in this situation is best considered to be the result of:

- a. reinforcement
- b. punishment
- c. classical conditioning
- d. habituation

Answer: d

Page: 54

Learning Objective 2.8

Applied  
Moderate

Rationale: In habituation, a person ceases to attend or respond to repetitive stimulation.

2.115. When a person repeatedly experiences the same stimulus, he or she typically will tend to respond to it less and less with each repetition. This process is referred to as:

- a. classical conditioning
- b. punishment
- c. operant conditioning
- d. habituation

Answer: d

Page: 54

Learning Objective 2.8

Applied

Easy

Rationale: In habituation, a person ceases to attend or respond to repetitive stimulation.

2.116. The key to understanding how classical conditioning works is to recognize that it involves the \_\_\_\_\_ of what will come.

- a. reinforcement
- b. punishment
- c. prediction
- d. repression

Answer: c

Page: 54

Learning Objective 2.8

Conceptual

Difficult

Rationale: In classical conditioning, learning occurs when, through repeated trials, we learn to associate one stimulus with another naturally occurring stimulus–response sequence. In other words, we learn that a stimulus predicts that a sequence of events will occur.

2.117. Three-year-old Kayla has been seeing her pediatrician for checkups every six months and fears the shots she receives each time. Now, even though he does not administer the shots, Kayla cries when the pediatrician enters the room because she associates him with receiving shots. The pediatrician has become a(n):

- a. conditioned stimulus
- b. conditioned response
- c. unconditioned stimulus
- d. unconditioned response

Answer: a

Page: 54

Learning Objective 2.8

Applied

Moderate

Rationale: In classical conditioning, a naturally occurring reflex becomes associated with an environmental cue. In this case, the fear that accompanies an impending shot has become associated with the pediatrician who has administered these shots in the past. The pediatrician is the environmental cue.

2.118. An unreasonable fear of an object or a situation is referred to as a:

- a. phobia
- b. conditioning
- c. habituation
- d. reinforcer

Answer: a  
Page: 54  
Learning Objective 2.8  
Factual  
Easy

- 2.119. Classical conditioning is most likely to be involved in which of the involving situations?
- Brian won't work unless he gets paid.
  - Alex trains his dog to "roll over" by offering food rewards.
  - Rick feels nervous and sick to his stomach when he sees a black cat, but doesn't know why.
  - John loses weight by buying tickets to see his favorite team play whenever he drops five more pounds.

Answer: c  
Page: 54  
Learning Objective 2.8  
Conceptual  
Moderate

Rationale: As noted in the textbook, emotional responses, in particular, are often established through classical conditioning. The other examples are directly tied to operant conditioning procedures.

- 2.120. If Wesley is afraid to enter tall buildings because he worries that they will be attacked by terrorists, psychologists would say his fear is most likely the result of:
- habituation
  - a phobia
  - heritability
  - poor self-efficacy

Answer: b  
Page: 54  
Learning Objective 2.8  
Applied  
Easy

Rationale: As noted in the textbook, unreasonable fears of objects or situations are called phobias; phobias—such as fear of the dark, fear of being in a closely confined space, and so forth—often are established through classical conditioning.

- 2.121. For as long as Brian can remember, he has been fearful of being in high places. Just the idea of climbing stairs or riding in an elevator causes him to be overcome with uncontrollable fear. Brian likely suffers from:
- a phobia
  - negative conditioning
  - habituation
  - reinforcement failure

Answer: a  
Page: 54  
Learning Objective 2.8  
Applied  
Easy

Rationale: As noted in the textbook, unreasonable fears of objects or situations are called phobias.

- 2.122. Operant conditioning is especially likely to be involved in the development of:
- phobias
  - excessive salivation
  - habituation
  - habits

Answer: d  
Page: 54-55  
Learning Objective 2.8  
Factual  
Moderate

- 2.123. Operant conditioning is most closely associated with which of the following?
- production of reflexive responses, such as salivation
  - production of emotional responses, such as fearfulness
  - the ability to screen meaningless repetitive stimuli out of consciousness
  - understanding the effect of consequences that follow a particular behavior

Answer: d  
Page: 54-55  
Learning Objective 2.8  
Conceptual  
Moderate

Rationale: Operant conditioning involves the application or removal of rewards (called reinforcements) and punishments to encourage or discourage us from acting in certain ways. Both reinforcements and punishments constitute consequences that follow a particular behavior.

- 2.124. Which of the following is the best example of a partial schedule of reinforcement?
- Every time he cries, Robert's mother picks him up.
  - Vickie has a tantrum every time her mother takes her to the grocery store because once or twice in the past her mother has given in and bought her candy to quiet her down.
  - Julie has come to expect that she will be paid for babysitting her little brother because this is what parents always do.
  - Jake has a terrible fear of spiders that his therapist has now diagnosed as a phobia.

Answer: b  
Page: 55  
Learning Objective 2.8  
Applied  
Difficult

Rationale: In a partial schedule of reinforcement, reinforcements occur only occasionally, not every time a behavior occurs.

- 2.125. A consequence that decreases the probability that a behavior will be repeated is a technical definition of the term:
- punishment
  - threat
  - self-efficacy
  - partial schedule

Answer: a  
Page: 54  
Learning Objective 2.8  
Conceptual  
Easy

Rationale: As noted in the textbook, punishments decrease the probability that a behavior will be repeated.

- 2.126. Systematically reinforcing successive approximations to a desired act defines:
- shaping
  - counterconditioning
  - stimulus generalization

d. systematic desensitization

Answer: a

Page: 55

Learning Objective 2.8

Factual

Easy

2.127. Suppose Sandra has difficulty in concentrating while doing her homework. She decides to reward herself for reading 5 minutes without letting her mind wander. After a week of this, she decides to reward herself only when she reads for 10 minutes without distraction. Finally, she is able to concentrate for 15 minutes at a time without distraction. Sandra's ability to improve her study behavior is best considered an example of:

- a. shaping
- b. classical conditioning
- c. habituation
- d. punishment

Answer: a

Page: 55

Learning Objective 2.8

Applied

Moderate

Rationale: Shaping involves systematically reinforcing successive approximations to a desired behavior. In this case, Sandra reinforces her successive approximations (studying for 5 minutes) of the desired behavior (studying for 15 minutes without distraction).

2.128. Learning through the method of "successive approximation" is at the heart of the concept called:

- a. self-efficacy
- b. classical conditioning
- c. partial schedules of reinforcement
- d. shaping

Answer: d

Page: 55

Learning Objective 2.8

Factual

Easy

2.129. Rex decides that the only way he will ever be able to work hard enough to pass his chemistry class is to give himself a reward after every chapter he reads and every lab report he turns in on time. His approach to studying is best thought of as an example of:

- a. classical conditioning
- b. behavior modification
- c. habituation
- d. normative age-graded influences

Answer: b

Page: 55

Learning Objective 2.8

Applied

Moderate

Rationale: Behavior modification is a method that uses conditioning procedures—such as reinforcement, reward, and shaping—to change behavior.

2.130. The application of learning principles in order to change behavior is called:

- a. EPS: Establishing Partial Schedules



- b. CC-OC: Classical Conditioning-Operant Conditioning
- c. ABA: Applied Behavioral Analysis
- d. Meta-analysis

Answer: c

Page: 55

Learning Objective 2.8

Factual

Easy

2.131. Whitney believes that she is a capable, confident person who can usually succeed in whatever she tries to do. Psychologists would be most likely to conclude that she has:

- a. a phobia
- b. a strong sense of self-efficacy
- c. a comfortable developmental niche
- d. established a codominant relationship with her parents

Answer: b

Page: 56

Learning Objective 2.8

Applied

Easy

Rationale: Self-efficacy refers to what a person believes he or she is capable of doing in a given situation.

***Environment in a Broader Context: Family and Culture***

2.132. The unique world experienced by each individual is called that person's:

- a. developmental niche
- b. personal space
- c. family system
- d. normative space

Answer: a

Page: 56

Learning Objective 2.9

Factual

Easy

2.133. If different members of the family experience quite different environments, this would be reflected in:

- a. a larger shared environment
- b. a larger nonshared environment
- c. a harsher developmental niche
- d. a challenge for self-concept development

Answer: b

Page: 57

Learning Objective 2.9

Conceptual

Difficult

Rationale: Nonshared environment refers to those experiences and relationships that persons do not share.

2.134. The tendency to assume that one's own cultural beliefs are normal and those of others are abnormal is referred to as:

- a. cohesion
- b. socialization
- c. ethnocentrism

d. indoctrination

Answer: c

Page: 57

Learning Objective 2.8

Factual

Easy

2.135. Patty doesn't want to hang around with people from the other side of town because she says they are "weird." Patty's behavior best reflects the concept involved in:

- a. ethnocentrism
- b. self-efficacy
- c. normative age-graded influences
- d. normative history-graded influences

Answer: a

Page: 57

Learning Objective 2.8

Applied

Moderate

Rationale: Ethnocentrism is the tendency to assume that our own beliefs, perceptions, customs, and values are correct or normal and that those of others are inferior or abnormal.

2.136. Little Timmy says, "Boys are cool and girls are stupid." Timmy's statement reflects the heart of what is meant by the term:

- a. normative age-graded influences
- b. nonnormative influences
- c. self-efficacy
- d. ethnocentrism

Answer: d

Page: 57

Learning Objective 2.8

Applied

Moderate

Rationale: Ethnocentrism is the tendency to assume that our own beliefs, perceptions, customs, and values are correct or normal and that those of others are inferior or abnormal.

2.137. Which of the following is an example of a normative history-graded influence on development?

- a. retirement
- b. career change
- c. economic depression
- d. unemployment

Answer: c

Page: 59

Learning Objective 2.8

Factual

Easy

2.138. At age 65, Reggie retired from high school teaching. This change most likely reflects a:

- a. normative, age-graded influence
- b. normative, history-graded influence
- c. nonnormative influence
- d. normative, gender-graded influence

Answer: a

Page: 59

Learning Objective 2.8

Applied

Moderate

Rationale: Normative, age-graded influences refer to the biological and social changes that normally happen at predictable ages (e.g., puberty, menopause, entering school). Most people retire around age 65.

2.139. Many individuals who grew up during the Great Depression were so devastated by the collapse of the economy that they became distrustful of depositing large sums of money in banks. The Great Depression would best be considered a:

- a. normative, age-graded influence
- b. normative, history-graded influence
- c. nonnormative influence
- d. normative, economic-graded influence

Answer: b

Page: 59

Learning Objective 2.9

Applied

Moderate

Rationale: Normative, history-graded influences refer to the historical events that affect large numbers of individuals at the same time (e.g., wars, depressions, epidemics). The Great Depression is one such example.

2.140. After Bill's parents' divorce, he and his mother were forced to move into an apartment and he had to switch schools. The losses Bill experienced following the divorce marked a turning point in his life, because from then on, he did poorly in school. His parents' divorce would be considered a:

- a. normative, age-graded influence
- b. normative, history-graded influence
- c. nonnormative influence
- d. normative, gender-graded influence

Answer: c

Page: 59

Learning Objective 2.9

Applied

Difficult

Rationale: Nonnormative influences refer to the individual environmental factors that do not occur at any predictable time in a person's life (e.g., divorce, unemployment, career changes). Experiencing one's parents' divorce is not an event that can be predicted to occur at a predictable time in a person's life, if at all.

2.141. Which of the following is NOT an example of a normative history-graded influence?

- a. a world-wide disease epidemic
- b. war
- c. menopause
- d. economic depression

Answer: c

Page: 59

Learning Objective 2.9

Conceptual

Moderate

Rationale: Normative, history-graded influences refer to the historical events that affect large numbers of individuals at the same time (e.g., wars, depressions, epidemics). Menopause is an example of a normative, age-graded influence.

- 2.142. Which of the following is NOT an example of a normative age-graded influence?
- a. having children
  - b. puberty
  - c. divorce
  - d. menopause

Answer: c

Page: 59

Learning Objective 2.9

Conceptual

Moderate

Rationale: Normative, age-graded influences refer to the biological and social changes that normally happen at predictable ages (e.g., puberty, menopause, entering school). Divorce does not occur at a predictable age, if at all.

- 2.143. Which of the following is MOST likely to be experienced as a normative influence?
- a. retirement
  - b. career change
  - c. illness
  - d. moving to a new community

Answer: a

Page: 59

Learning Objective 2.9

Conceptual

Moderate

Rationale: Normative influences occur at a predictable time or have a predictable effect on large numbers of people. Most people retire, predictably, around age 65.

- 2.144. In general, the impact of nonnormative influences are greatest at which of the following periods of the lifespan:
- a. in the prenatal period and in infancy
  - b. in early and middle childhood
  - c. in adolescence and early adulthood
  - d. in later adulthood and old age

Answer: d

Page: 59-60

Learning Objective 2.9

Factual

Moderate

### ***Changing Perspectives: Genetic Engineering and Cloning***

- 2.145. If a scientist were to clone a rat, the genetic code in the new rat produced would share what percentage of its genetic code with its parent(s)?
- a. it would share 50% of its genes with its mother and 50% with its father
  - b. it would share 50% with its mother, but 0% with its father
  - c. it would share 50% with its father, but 0% with its mother
  - d. it would have only one "parent" and would share 100% of its genetic code with it

Answer: d

Page: 52

Learning Objective 2.2, 2.5

Conceptual

Moderate

Rationale: To clone something means to duplicate it exactly. In the context of genetic engineering, cloning can refer to the replication of DNA segments used to produce drugs like insulin or to the exact duplication of an entire living organism. In the cloning of an animal, the new animal would be an exact duplication of a parent.

- 2.146. In agriculture, the traditional practice of genetic engineering is called:
- green engineering
  - selective breeding
  - cloning
  - genetic replication

Answer: b

Page: 52

Learning Objective 2.2, 2.5

Factual

Moderate

- 2.147. Generalizing from the text, you should conclude that the primary problem with cloning human beings has to do with:
- ethical issues
  - the much greater complexity of the human brain as compared to animal brains
  - the financial costs involved
  - the long prenatal period that humans experience compared to animals

Answer: a

Page: 52

Learning Objective 2.2, 2.5

Conceptual

Easy

Rationale: As an example of an ethical concern, some groups are concerned that even those cloning techniques that stop far short of human replication intrude into what they consider to be the sanctity of life.

***Current Issues: The New Baby and the Extended Family System***

- 2.148. Research presented in the text noted that, in comparison to young mothers with ill or premature infants who lived away from their extended family, those who lived with their extended family:
- were less likely to complete their education
  - were less likely to keep the job they had before the baby was born
  - were less likely to have good parenting skills
  - had more self-confidence in their ability to be a good parent

Answer: c

Page: 58

Learning Objective 2.9

Factual

Difficult

- 2.149. Which of the following is the best example of what is usually meant by the term “nuclear family?”
- a mother, father, and children
  - grandparents, parents, and children
  - any family whose primary breadwinner is the father
  - any family with three or more children

Answer: a

Page: 58

Learning Objective 2.9

Factual

Easy

**True/False questions:**

***Molecular Genetics***

2.150. To say that genetics and environment interact means that these forces influence each other.

Answer: True  
Page: 35  
Learning Objective 2.1  
Factual

2.151. We share about 98% of our genes with chimpanzees.

Answer: True  
Page: 37  
Learning Objective 2.1  
Factual

2.152. In the human body, there are approximately 20 different kinds of cells, which are arranged in different ways to create different tissues and organs.

Answer: False  
Page: 35  
Learning Objective 2.1  
Factual  
Rationale: The human body is comprised of over 200 different kinds of cells.

2.153. Mitochondria are the “powerhouses” of a cell.

Answer: True  
Page: 35  
Learning Objective 2.1  
Factual

2.154. Scientists have been able to identify markers in the human DNA that distinguishes different races of people.

Answer: False  
Page: 37-38  
Learning Objective 2.1  
Conceptual  
Rationale: Traits that are associated with different race-based features, such as skin color, are distributed continuously through the population and there are no “either-or” traits that differentiate different racial groups. Instead, the concept of race is better thought of as a social construct, more closely related to ethnicity than a particular genetic code.

2.155. There are about one million genes in the human genome.

Answer: False  
Page: 38  
Learning Objective 2.1  
Factual  
Rationale: There are about 20,000 to 25,000 genes in the human genome.

2.156. The primary function of proteins called antibodies is to speed up the chemical reactions within cells.

Answer: False

Page: 38

Learning Objective 2.1

Factual

Rationale: The primary function of antibodies is to protect the body from disease.

### ***Genes, Chromosomes, and Cell Division***

2.157. Most cells in the human body divide according to the process of mitosis; however the gametes divide in a process called meiosis.

Answer: True

Page: 39-40

Learning Objective 2.2

Factual

2.158. Normal adults have 46 chromosomes contained within each of their body cells. Thus, when a couple's sperm and ovum unite, the resulting baby will have 92 chromosomes in each body cell.

Answer: False

Page: 39-40

Learning Objective 2.2

Applied

Rationale: Normal body cells have 46 chromosomes, except for sperm and egg cell, which have one-half of a normal complement of chromosomes. Thus, when sperm and egg unite, each contributes 23 chromosomes, which join together to make 23 pair, or 46, chromosomes.

2.159. Most human traits involve polygenic inheritance (multiple genes) rather than a single gene.

Answer: True

Page: 41

Learning Objective 2.2

Conceptual

2.160. Blood type is a good example of a sex-linked trait, which means that certain blood types are more common in males than in females.

Answer: False

Page: 41

Learning Objective 2.2

Conceptual

Rationale: Blood type is an example of a trait that is codominant, meaning that individuals who carry different alleles inherit the phenotype that is a blending of the two traits carried by parents.

2.161. Sometimes in the process of meiosis genetic material crosses over from one allele in a chromosome to another. This process results in unique new recombinant alleles.

Answer: True

Page: 41-42

Learning Objective 2.2

Conceptual

2.162. Because there are so many possibilities for how genes can combine in the process of human reproduction, two human parents theoretically could produce hundreds of trillions of genetically unique children.

Answer: True  
Page: 42  
Learning Objective 2.2  
Factual

2.163. Although it was earlier thought that cell mutations were quite rare, more recent research has found that they actually occur quite frequently.

Answer: True  
Page: 42  
Learning Objective 2.2  
Factual

2.164. It is true that genetic forces sometimes cause people to seek out certain types of environmental situations.

Answer: True  
Page: 43  
Learning Objective 2.3  
Conceptual

2.265. The idea that nongenetic factors can influence how genes behave is referred to as “polygenic” influences.

Answer: False  
Page: 43  
Learning Objective 2.3  
Factual

Rationale: Nongenetic forces that influence gene behavior are called “epigenetic” forces. “Polygenic” is a term meaning that more than one gene is involved in the expression of a trait; an example would be intelligence.

### ***Genetic and Chromosomal Disorders***

2.166. Each year in the United States congenital anomalies (or birth defects) affect between 10% and 15% of all births.

Answer: False  
Page: 44  
Learning Objective 2.4  
Factual

Rationale: Congenital anomalies affect about 3% of the infants born in the United States today.

2.167. Sex-linked traits occur when the autosomes do not replicate correctly.

Answer: False  
Page: 44-45  
Learning Objective 2.4  
Conceptual

Rationale: Sex-linked traits occur when the gametes do not replicate correctly.

2.168. Hemophilia and color blindness are examples of abnormalities associated with genes on the sex chromosomes.

Answer: True  
Page: 44-45  
Learning Objective 2.4  
Applied



2.169. Because the genes that code for Fragile X disorder are on the X chromosome, females are affected much more often and more seriously than males.

Answer: False

Page: 45

Learning Objective 2.4

Conceptual

Rationale: Fragile X syndrome is a trait carried on the X chromosome, but it is more commonly diagnosed in males, since they do not have the corresponding chromosome site on the Y-chromosome that could carry a dominant version of this allele.

2.170. Down syndrome is an example of an autosomal disorder.

Answer: True

Page: 45-46

Learning Objective 2.4

Factual

2.171. Gene imprinting results in the situation in which an extra chromosome or piece of chromosome is included in a person's genotype.

Answer: False

Page: 47

Learning Objective 2.4

Conceptual

Rationale: Gene imprinting is a phenomenon in which a person's phenotype depends not on which genes are inherited, but rather on whether the genes for a trait come from the mother versus the father.

2.172. Mitochondrial disorders involve DNA that is inherited from the mother.

Answer: True

Page: 47-48

Learning Objective 2.4

Factual

2.173. Something that recombinant gene technologies have in common is that they involve extracting some genetic material from cells and reintroducing it into different cells.

Answer: True

Page: 50

Learning Objective 2.5

Conceptual

### ***Behavior Genetics***

2.174. Once the human genome is completely mapped, the field of behavior genetics will no longer be useful.

Answer: False

Page: 51

Learning Objective 2.6

Rationale: Behavior genetics will always be useful because it considers not only the person's genes but also how the environment modifies their action.

2.175. If a trait has a heritability that is greater than zero, then the concordance rate for identical twins will be greater than for fraternal twins.

Answer: True  
Page: 51  
Learning Objective 2.7  
Conceptual

***Environmental Influences and Contexts***

2.176. Habituation is the learning process that is usually associated with the learning of emotional responses, including phobias.

Answer: False  
Page: 54  
Learning Objective 2.8  
Conceptual

Rationale: Phobias and other emotional responses are typically learned through classical conditioning processes, not habituation.

2.177. When applied behavior analysis programs involve a slow, progressive set of expectations that become more demanding over time, this is called shaping.

Answer: True  
Page: 55  
Learning Objective 2.8  
Applied

***Environment in a Broader Context: Family and Culture***

2.178. The nonshared environment for identical twins raised in the same home would be zero.

Answer: False  
Page: 57  
Learning Objective 2.9  
Conceptual

Rationale: Even identical twins do not experience the same environment, thus they do experience at least some non-shared environmental circumstances unique to each individual.

2.179. Only the most primitive cultures exhibit ethnocentrism, which is the working assumption that one's own beliefs, perceptions, customs, and values are correct and that those of others are inferior.

Answer: False  
Page: 57  
Learning Objective 2.9  
Conceptual

Rationale: Ethnocentrism, which is correctly defined in this question, is present to some degree in all cultures.

2.180. The Great Depression is a good example of a nonnormative, history-graded influence.

Answer: False  
Page: 59  
Learning Objective 2.9  
Applied

Rationale: The Great Depression was an event that was common to all people living at that period of time. Therefore it is a good example of a normative history-graded influence on development.

2.181. Graduating from high school is a good example of a normative age-graded influence.

Answer: True  
Page: 59  
Learning Objective 2.9  
Applied

**Short Answer questions:**

***Molecular Genetics***

2.182. What are the three different ways that nucleotides in the DNA molecule can determine the particular way that individuals differ from each other?

Page: 36-37  
Learning Objective 2.1  
Conceptual

***Genes, Chromosomes, and Cell Division***

2.183. In your own words, explain the difference between a gene and a chromosome.

Page: 38  
Learning Objective 2.1  
Conceptual

2.184. Identify two ways that the processes of mitosis and meiosis differ.

Page: 39-40  
Learning Objective 2.2  
Conceptual

2.185. Give an example of the three genotypes that could exist for a single-gene trait, such as eye color. What phenotype is associated with each of these three genotypes?

Page: 40-41  
Learning Objective 2.2  
Applied

2.186. How does a trait governed by polygenic inheritance differ from one governed by a single gene? Give an example of a trait determined by each of these processes.

Page: 41  
Learning Objective 2.2  
Conceptual

2.187. Define what is meant by “independent assortment” as this term is applied to how meiosis occurs.

Page: 41-42  
Learning Objective 2.2  
Conceptual

2.188. Describe what is meant by the term “gene-environment interaction,” giving an example to demonstrate your answer.

Page: 43  
Learning Objective 2.3

Conceptual

2.189. Describe how nongenetic segments of DNA can influence the expression of genetic traits.

Page: 43

Learning Objective 2.3

Applied

### ***Genetic and Chromosomal Disorders***

2.190. Explain why sex-linked traits are more common among males than females.

Page: 44-45

Learning Objective 2.4

Conceptual

2.191. Suggest two ways that mitochondrial disorders are different from other types of genetic disorders.

Page: 47-48

Learning Objective 2.4

Conceptual

2.192. Suggest two ways in which genetics counselors can be of use to couples who are thinking about having a baby.

Page: 48, 50

Learning Objective 2.5

Applied

2.193. Describe how retroviruses are useful in gene therapy.

Page: 50

Learning Objective 2.5

Applied

### ***Behavior Genetics***

2.194. Why will the field of behavioral genetics always be of use, even if the human genome is completely mapped?

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Learning Objective 2.6

Conceptual

2.195. Suppose that a particular trait results from the interaction of hereditary and environmental forces. Describe the expected results from a typical adoption study of the heritability of this trait.

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Learning Objective 2.7

Conceptual

### ***Environmental Influences and Contexts***

2.196. Give an original example that portrays the kind of learning called habituation.

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Learning Objective 2.8  
Applied

2.197. What is the primary difference between a reinforcer and a punishment, according to operant conditioning theory?

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Learning Objective 2.8  
Conceptual

2.198. Give an example of a behavior that is learned or maintained according to a partial schedule of reinforcement.

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Learning Objective 2.8  
Applied

### ***Environmental Influences and Contexts***

2.199. Give an example of a statement that reflects an ethnocentric viewpoint.

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Learning Objective 2.9  
Applied

2.200. Give an example of a normative age-graded influence, an example of a normative history-graded influence, and an example of a nonnormative influence in human development.

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Learning Objective 2.9  
Applied

### **Essay questions:**

### ***Molecular Genetics***

2.201. Describe the structure of the DNA molecule and explain how the entire genetic code is constructed with only four different bases: adenine, thymine, cytosine, and guanine.

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Learning Objective 2.1  
Conceptual

2.202. Discuss how the concept of “race” is typically considered from a genetic point of view. In your discussion, answer the questions: Are there “racial” differences that are coded in the genes?

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Learning Objective 2.1  
Conceptual

### ***Genes, Chromosomes, and Cell Division***

2.203. Describe what a karyotype of the chromosomes of a typical person looks like. Include in your answer an explanation of the distinction between the autosomes and the sex chromosomes.

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Learning Objective 2.2  
Conceptual

2.204. What occurs during the process of mitosis and the process of meiosis? How do the processes of mitosis and meiosis differ?

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Learning Objective 2.2  
Conceptual

2.205. Define the concept of “allele” and suggest the allele configuration of a homozygous versus a heterozygous trait.

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Learning Objective 2.2  
Conceptual

2.206. Give an example of a sex-linked trait and describe why such traits are more frequently observed in males than females.

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Learning Objective 2.2  
Conceptual

2.207. Explain how epigenetic processes provide an explanation for gene-environment interactions and give an example to demonstrate your answer.

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Learning Objective 2.3  
Conceptual

### ***Genetic and Chromosomal Disorders***

2.208. Describe what services are offered by genetics counselors and suggest why a couple might choose to seek out these services.

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Learning Objective 2.5  
Conceptual

2.209. Give an example of a genetic disorder and of a chromosomal disorder. What is the difference between these two types of disorders?

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Learning Objective 2.4  
Applied

2.210. Explain how recombinant technology can be used as part of a gene therapy program.

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Learning Objective 2.5  
Conceptual

### ***Behavior Genetics***

2.211. Define what is meant by “concordance” and describe how a concordance study would be conducted using twins.

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Learning Objective 2.6  
Conceptual

2.212. Explain the rationale for using adoption studies and twin studies in learning about genetic influences on behavior.

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Learning Objective 2.7  
Conceptual

### ***Environmental Influences and Contexts***

2.213. Describe how a phobia would be explained, using a classical conditioning model.

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Learning Objective 2.8  
Conceptual

2.214. Suppose you want to improve your study habits. Describe how an applied behavior analysis program based on shaping could be used to help you accomplish this goal.

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Learning Objective 2.8  
Applied

2.215. Explain the difference between the terms self-concept and self-efficacy.

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Learning Objective 2.8  
Conceptual

### ***Environment in a Broader Context: Family and Culture***

2.216. Give an example of ethnocentric thinking and explain why researchers in the area of human development must be especially aware of its influence as they formulate theories.

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Learning Objective 2.9  
Conceptual

2.217. Distinguish between normative age-graded influences and normative history-graded influences and give an example of each.

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Learning Objective 2.9  
Applied

2.218. Describe how normative age-graded influence, normative history-graded influences, and nonnormative events change in their relative influence on development across the lifespan. Which are most important in early life? Which are most important in later life?

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Learning Objective 2.9  
Conceptual