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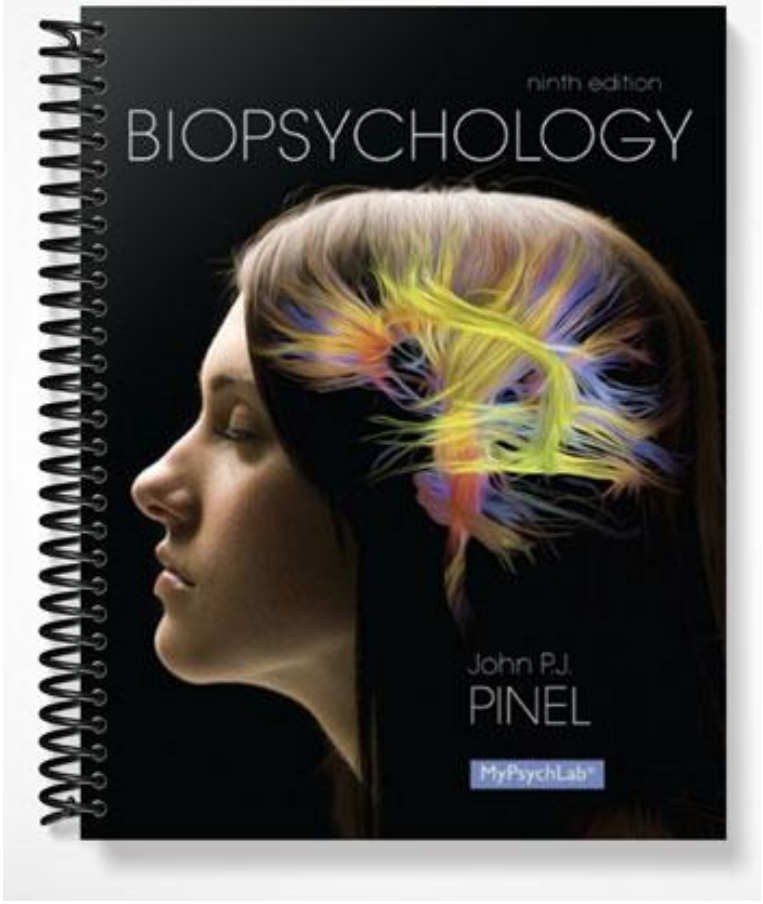

CHAPTER 2
EVOLUTION, GENETICS, AND EXPERIENCE: THINKING ABOUT THE BIOLOGY OF BEHAVIOR

MULTIPLE CHOICE QUESTIONS

1) The general intellectual climate of a culture is referred to as its
A) canon.
B) guano.
C) Zeitgeist.
D) converging operations.
E) confounds.
Answer: C
Diff: 1 Page Ref: 21
Topic: Chapter 2 Introduction
Type: (Factual)

2) A major purpose of Chapter 2 of Biopsychology is to teach you not to think about the biology of behavior in terms of
A) instinct.
B) Cartesian dualism.
C) traditional dichotomies.
D) psychology.
E) the brain.
Answer: C
Diff: 2 Page Ref: 21
Topic: 2.1 Thinking about the Biology of Behavior
Type: (Factual)

3) The idea that the human brain and human mind are separate entities was formalized in the 1600s by
A) Hebb.
B) Locke.
C) Plato.
D) Descartes.
E) Pinel.
Answer: D
Diff: 2 Page Ref: 21-22
Topic: 2.1 Thinking about the Biology of Behavior
Type: (Factual)

4) Descartes's philosophy was called
A) monism.
B) behaviorism.
C) ethology.
D) mentalism.
E) dualism.
Answer: E
Diff: 2 Page Ref: 22

Topic: 2.1 Thinking about the Biology of Behavior
Type: (Factual)

5) Nature is to nurture as
A) learning is to genetics.
B) behaviorism is to ethology.
C) genetics is to experience.
D) both A and B
E) both B and C
Answer: C
Diff: 3 Page Ref: 22
Topic: 2.1 Thinking about the Biology of Behavior
Type: (Factual)

6) European ethologists focused on the study of
A) invertebrates.
B) instinctive behaviors.
C) learning.
D) both A and C
E) both B and C
Answer: B
Diff: 3 Page Ref: 22
Topic: 2.1 Thinking about the Biology of Behavior
Type: (Factual)

7) Asomatognosia is a
A) form of Korsakoff's syndrome.
B) dualistic philosophy.
C) learned response.
D) consequence of hypothalamic damage.
E) deficiency in the awareness of parts of one's own body.
Answer: E
Diff: 1 Page Ref: 22
Topic: 2.1 Thinking about the Biology of Behavior
Type: (Factual)

8) Asomatognosia typically
A) results from damage to the right parietal lobe.
B) affects the left side of the body.
C) affects both sides of the body.
D) affects the right side of the body.
E) both A and B
Answer: E
Diff: 3 Page Ref: 22
Topic: 2.1 Thinking about the Biology of Behavior
Type: (Factual)

9) Depicted here is the cortex of the right
A) parietal lobe.
B) hippocampus.
C) striatum.
D) frontal lobe.
E) prefrontal lobe.
Answer: A
Diff: 1 Page Ref: 23
Topic: 2.1 Thinking about the Biology of Behavior
Type: (Factual)

10) One way to study self-awareness in nonhuman animals is to confront them with
A) a mirror.
B) a photograph of themselves.
C) an experiment.
D) a frontal-lobe lesion.
E) a difficult task.
Answer: A
Diff: 1 Page Ref: 23
Topic: 2.1 Thinking about the Biology of Behavior
Type: (Factual)

11) According to the text, the phrase, "Reports of its death have been greatly exaggerated." sums up the history of
A) biopsychology.
B) physiology.
C) Cartesian dualism.
D) nature-or-nurture thinking.
E) comparative psychology.
Answer: D
Diff: 3 Page Ref: 24
Topic: 2.1 Thinking about the Biology of Behavior
Type: (Factual)

12) All behavior is the product of
A) an organism's genetic endowment.
B) an organism's experience.
C) an organism's perception of the current situation.
D) all of the above
E) both A and B
Answer: D
Diff: 3 Page Ref: 24
Topic: 2.1 Thinking about the Biology of Behavior
Type: (Conceptual)
Rationale: The answer is reinforced by Figure 2.3.

13) The single most influential theory in the biological sciences is the theory of
A) D. O. Hebb.
B) Charles Darwin.
C) evolution.
D) both A and C
E) both B and C
Answer: E
Diff: 2 Page Ref: 24
Topic: 2.2 Human Evolution
Type: (Factual)

14) Darwin's theory of evolution was published in
A) 1312.
B) 1562.
C) 1859.
D) 1920.
E) 1943.
Answer: C
Diff: 2 Page Ref: 24
Topic: 2.2 Human Evolution
Type: (Factual)
Rationale: This seems to be an extremely specific question, but because the incorrect options are so grossly incorrect, students need to have only a general idea of the timing to answer correctly.

15) Darwin was not the first to suggest that species evolve, but he was the first to suggest that
A) evolution occurs through natural selection.
B) cultures rarely evolve.
C) evolution occurs by genetics.
D) mammals do not evolve.
E) sex is an important component of evolution for all living species.
Answer: A
Diff: 2 Page Ref: 25
Topic: 2.2 Human Evolution
Type: (Factual)

16) Darwin suggested a mechanism for evolution:
A) genes.
B) natural selection.
C) sex.
D) all of the above
E) none of the above
Answer: B
Diff: 2 Page Ref: 25
Topic: 2.2 Human Evolution
Type: (Factual)

17) Horse breeders have created faster horses through programs of
A) natural selection.
B) gene splicing.
C) selective breeding.
D) domestication.
E) euthanasia.
Answer: C
Diff: 1 Page Ref: 25
Topic: 2.2 Human Evolution
Type: (Factual)

18) Fitness in the Darwinian sense refers to an organism's ability to
A) survive and contribute large numbers of fertile offspring to the next generation.
B) remain healthy.
C) win fights.
D) survive.
E) avoid predation.
Answer: A
Diff: 2 Page Ref: 25
Topic: 2.2 Human Evolution
Type: (Factual)

19) Social dominance is an important factor in evolution because dominant males often
A) kill their mates.
B) become seriously injured.
C) produce more offspring than nondominant males.
D) establish hierarchies.
E) are much larger.
Answer: C
Diff: 2 Page Ref: 26
Topic: 2.2 Human Evolution
Type: (Factual)

20) Courtship displays are important evolutionary phenomena because they
A) promote the evolution of new species.

B) promote extinction.
C) facilitate aggression.
D) encourage social dominance.
E) eliminate copulation.
Answer: A
Diff: 2 Page Ref: 27
Topic: 2.2 Human Evolution
Type: (Factual)

21) The conspecific of a vole is a
A) rat.
B) monkey.
C) human.
D) mouse.
E) vole.
Answer: E
Diff: 2 Page Ref: 27
Topic: 2.2 Human Evolution
Type: (Factual)

22) Evidence suggests that complex multicellular, water-dwelling organisms first appeared on earth
A) in the early 1920s.
B) 600 million years ago.
C) 10 million years ago.
D) 4 million years ago.
E) 2 million years ago.
Answer: B
Diff: 2 Page Ref: 27
Topic: 2.2 Human Evolution
Type: (Factual)
Rationale: This has the appearance of a very specific question, but the student requires only a general concept of the timing to answer correctly.

23) Animals with dorsal nerve cords are called
A) phyla.
B) chordates.
C) vertebrates.
D) mammals.
E) amphibians.
Answer: B
Diff: 2 Page Ref: 27
Topic: 2.2 Human Evolution
Type: (Factual)

24) Which of the following are chordates?
A) humans
B) vertebrates
C) Florida walking catfish
D) mammals
E) all of the above
Answer: E
Diff: 2 Page Ref: 27
Topic: 2.2 Human Evolution
Type: (Conceptual)
Rationale: Any animal with a dorsal nerve cord is a chordate.

25) Which of the following is not true?
A) All mammals are chordates.

B) All chordates are vertebrates.
C) All reptiles are vertebrates.
D) All mammals are vertebrates.
E) All vertebrates are chordates.
Answer: B
Diff: 3 Page Ref: 27
Topic: 2.2 Human Evolution
Type: (Conceptual)
Rationale: To choose the correct answer, students must understand that some animals have dorsal nerve cords without having spines.

26) Birds and reptiles are
A) amphibians.
B) chordates.
C) vertebrates.
D) all of the above
E) both B and C
Answer: E
Diff: 3 Page Ref: 27
Topic: 2.2 Human Evolution
Type: (Conceptual)
Rationale: To choose the correct answer, students must understand that birds and reptiles have both spines and dorsal nerve cords and that they are not amphibians.

27) The first animals to start to venture out of the water were
A) reptiles.
B) bony fishes.
C) amphibians.
D) Florida walking catfish.
E) both B and C
Answer: B
Diff: 3 Page Ref: 28
Topic: 2.2 Human Evolution
Type: (Factual)

28) Frogs, toads, and salamanders are
A) vertebrates.
B) chordates.
C) amphibians.
D) all of the above
E) both A and C
Answer: D
Diff: 3 Page Ref: 27
Topic: 2.2 Human Evolution
Type: (Factual)

29) Lizards, snakes, and turtles are
A) reptiles.
B) amphibians.
C) vertebrates.
D) both A and C
E) both B and C
Answer: D
Diff: 2 Page Ref: 28
Topic: 2.2 Human Evolution
Type: (Factual)
Rationale: The key to answering this question correctly is to understand that lizards, snakes, and turtles are not amphibians.

30) Reptiles evolved directly from
A) amphibians.
B) fish.
C) bony fish.
D) prosimians.
E) snakes.
Answer: A
Diff: 2 Page Ref: 28
Topic: 2.2 Human Evolution
Type: (Factual)

31) Reptiles were the first animals to
A) have back bones.
B) lay shell-covered eggs.
C) be covered by dry scales.
D) both A and B
E) both B and C
Answer: E
Diff: 3 Page Ref: 28
Topic: 2.2 Human Evolution
Type: (Factual)

32) Mammals evolved directly from
A) reptiles.
B) fish.
C) amphibians.
D) prosimians.
E) primates.
Answer: A
Diff: 2 Page Ref: 28
Topic: 2.2 Human Evolution
Type: (Factual)

33) One remaining mammalian species that lays eggs is the
A) duck-billed platypus.
B) hominin.
C) prosimian.
D) Florida walking catfish.
E) orangutan.
Answer: A
Diff: 2 Page Ref: 28
Topic: 2.2 Human Evolution
Type: (Factual)
Rationale: This appears to be a difficult question, but it should be relatively easy for alert students to rule out the incorrect options.

34) Prosimians, hominins, and apes are all
A) old-world monkeys.
B) new-world monkeys.
C) langurs.
D) primates.
E) both B and C
Answer: D
Diff: 3 Page Ref: 28
Topic: 2.2 Human Evolution
Type: (Factual)

35) Unlike Old-World monkeys, apes
A) do not have tails.
B) have opposable thumbs that are not useful for precise manipulation.
C) do not have opposable thumbs.
D) cannot walk upright for short distances.
E) have tails.
Answer: A
Diff: 3 Page Ref: 28
Topic: 2.2 Human Evolution
Type: (Factual)

36) According to the simplest theory, the hominin line is composed of two different genera:
A) Australopithecus and Homo.
B) apes and Homo sapiens.
C) apes and humans.
D) old-world monkeys and new-world monkeys.
E) reptiles and amphibians.
Answer: A
Diff: 3 Page Ref: 29
Topic: 2.2 Human Evolution
Type: (Factual)

37) The first hominins are thought to have evolved about
A) 200 million years ago.
B) 100 million years ago.
C) 50 million years ago.
D) 6 million years ago.
E) 1 million years ago.
Answer: D
Diff: 3 Page Ref: 28
Topic: 2.2 Human Evolution
Type: (Factual)

38) Australopithecines, the first hominins, are thought to have evolved about _____ years ago.
A) 100 million
B) 150 million
C) 90 million
D) 6 million
E) 100 thousand
Answer: D
Diff: 2 Page Ref: 28
Topic: 2.2 Human Evolution
Type: (Factual)

39) Australo means _____; pithecus means _____.
A) African; gorilla
B) southern; ape
C) African; chimpanzee
D) African; ape
E) African; man
Answer: B
Diff: 3 Page Ref: 29
Topic: 2.2 Human Evolution
Type: (Factual)

40) Well preserved 3.6-million-year-old footprints of 1.3-meter tall, small-brained _____ were discovered in African volcanic ash.
A) apes
B) Homo sapiens
C) Neanderthals
D) Australopithecines
E) archaeologists
Answer: D
Diff: 2 Page Ref: 30
Topic: 2.2 Human Evolution
Type: (Factual)

41) About 200 thousand years ago, early hominins were gradually replaced in the African fossil record by
A) old-world monkeys.
B) accountants.
C) modern humans.
D) primates.
E) Australopithecus.
Answer: C
Diff: 2 Page Ref: 30
Topic: 2.2 Human Evolution
Type: (Factual)

42) Metaphorically, evolution is a
A) scale.
B) ladder.
C) book.
D) bush.
E) soap dish.
Answer: D
Diff: 1 Page Ref: 30
Topic: 2.2 Human Evolution
Type: (Conceptual)
Rationale: Most students will enter the course thinking of evolution as a ladder; this question tests whether they have managed to modify their thinking.

43) The last surviving hominin species is
A) Australopithecus.
B) Homo sapiens.
C) prosimians.
D) lemurs.
E) tree shrews.
Answer: B
Diff: 1 Page Ref: 30
Topic: 2.2 Human Evolution
Type: (Factual)

44) Sudden evolutionary changes are often triggered by
A) selective breeding.
B) fossilization.
C) paleontologists.
D) brains.
E) sudden changes in the environment.
Answer: E
Diff: 1 Page Ref: 29
Topic: 2.2 Human Evolution
Type: (Factual)
Rationale: In this question, the incorrect options are obvious.

45) Scientists who study fossils are called
A) archaeologists.
B) evolutionists.
C) podiatrists.
D) geologists.
E) paleontologists.
Answer: E
Diff: 2 Page Ref: 30
Topic: 2.2 Human Evolution
Type: (Factual)

46) Approximately what proportion of all species that ever existed on earth are still in existence?
A) about 61%
B) about 31%
C) about 7.5%
D) less than 1%
E) about 19%
Answer: D
Diff: 2 Page Ref: 30
Topic: 2.2 Human Evolution
Type: (Factual)
Rationale: This specific question is relatively easy because the incorrect options are grossly incorrect.

47) Which of the following are evolutionary changes that are not adaptive?
A) spandrels
B) exaptations
C) homologous structures
D) analogous structures
E) both B and C
Answer: A
Diff: 3 Page Ref: 31
Topic: 2.2 Human Evolution
Type: (Conceptual)
Rationale: To answer this question correctly, students must have a good knowledge of the four concepts that comprise the list of options. Spandrels are incidental nonadaptive evolutionary by-products.

48) Which of the following characteristics evolved to perform one function and were then co-opted to perform another?
A) exaptations
B) spandrels
C) homologues
D) analogues
E) none of the above
Answer: A
Diff: 2 Page Ref: 31
Topic: 2.2 Human Evolution
Type: (Conceptual)
Rationale: This is an important concept because it means that the current function of an evolved characteristic does not necessarily indicate why it originally evolved.

49) Convergent evolution produces structures that are
A) convergent.
B) analogous.
C) homologous.
D) both A and C
E) both B and C
Answer: B
Diff: 3 Page Ref: 31
Topic: 2.2 Human Evolution
Type: (Conceptual)
Rationale: Convergent evolution is the evolution of similar structures from unrelated species--such similar but unrelated structures are said to be analogous.

50) A bird's wing and a bee's wing are
A) convolutions.
B) cerebral.
C) convergent.
D) homologous.
E) analogous.
Answer: E
Diff: 2 Page Ref: 31
Topic: 2.2 Human Evolution
Type: (Conceptual)
Rationale: Similar structures evolved from unrelated species are termed analogous.

51) Early research on the evolution of the brain focused on
A) its size.
B) the brain stem.
C) the thalamus.
D) the uvula.
E) its chemistry.
Answer: A
Diff: 1 Page Ref: 32
Topic: 2.2 Human Evolution
Type: (Factual)

52) Which species has a brain larger than the human brain?
A) whale
B) elephant
C) chimpanzee
D) all of the above
E) both A and B
Answer: E
Diff: 2 Page Ref: 32
Topic: 2.2 Human Evolution
Type: (Factual)

53) Modern adult human brains vary in size from about
A) 1,000 to 2,000 grams.
B) 10 to 20 grams.
C) 1,440 to 1,500 grams.
D) 1,300 to 1,400 grams.
E) 1,350 to 1,360 grams.
Answer: A
Diff: 3 Page Ref: 32
Topic: 2.2 Human Evolution
Type: (Factual)
Rationale: If students remember that there is a lot of variability in human brain size, they should be able to answer this seemingly specific question.

54) In terms of which of the following measures of brain size are humans surpassed by shrews?
A) brain weight
B) brain volume
C) neocortex volume
D) cerebellum volume
E) brain weight expressed as a percentage of total body weight
Answer: E
Diff: 2 Page Ref: 32
Topic: 2.2 Human Evolution
Type: (Factual)

55) In general, the brain stem regulates
A) thinking.
B) memory.
C) emotion.
D) reflex activities critical for survival.
E) vision.
Answer: D
Diff: 1 Page Ref: 32
Topic: 2.2 Human Evolution
Type: (Factual)

56) During the course of human evolution, there has been a general increase in the
A) size of the brain.
B) number of cortical convolutions.
C) size of the cortex.
D) size of the cerebrum.
E) all of the above
Answer: E
Diff: 1 Page Ref: 33
Topic: 2.2 Human Evolution
Type: (Factual)

57) The field that focuses on the evolution of human behavior is
A) the human genome.
B) humanism.
C) evolutionary psychology.
D) behavioral evolution.
E) human genetics.
Answer: C
Diff: 2 Page Ref: 33
Topic: 2.2 Human Evolution
Type: (Factual)

57) In most vertebrate species, mating is
A) monogamous.
B) promiscuous.
C) polygynous.
D) polyandrous.
E) asexual.
Answer: B
Diff: 2 Page Ref: 33
Topic: 2.2 Human Evolution
Type: (Factual)

59) The pattern of mate bonding that is most prevalent in mammals is
A) promiscuity.
B) polygyny.
C) monogamy.
D) polyandry.
E) marriage.
Answer: B
Diff: 2 Page Ref: 33
Topic: 2.2 Human Evolution
Type: (Factual)

60) According to one prominent theory, monogamy evolved in only those species
A) in which each female could raise more fit young if she had undivided help.
B) with opposable thumbs.
C) with large brains.
D) that used tools.
E) all of the above
Answer: A
Diff: 2 Page Ref: 34
Topic: 2.2 Human Evolution
Type: (Factual)

61) Mendel
A) studied dichotomous pea-plant traits.
B) began his experiments by crossing the offspring of true-breeding lines.
C) collaborated with Darwin.
D) all of the above
E) both A and B
Answer: E
Diff: 3 Page Ref: 35
Topic: 2.3 Fundamental Genetics
Type: (Factual)

62) Mendel's early experiments challenged the central premise upon which previous ideas about inheritance had rested. This was the premise that
A) there is only one gene for each trait.
B) there are two genes for each trait.
C) offspring can inherit only those traits that are displayed by their parents.
D) white seeds are dominant.
E) some traits are dominant and some are recessive.
Answer: C
Diff: 2 Page Ref: 35
Topic: 2.3 Fundamental Genetics
Type: (Factual)

63) An organism's observable traits are referred to as its
A) genotype.
B) phenotype.
C) dominant traits.
D) recessive traits.
E) none of the above
Answer: B
Diff: 2 Page Ref: 35
Topic: 2.3 Fundamental Genetics
Type: (Factual)

64) The two genes, one on each chromosome of a pair, that control the same trait are called
A) dominants.
B) phenotypes.
C) genotypes.
D) gametes.
E) alleles.
Answer: E
Diff: 2 Page Ref: 36
Topic: 2.3 Fundamental Genetics
Type: (Factual)

65) Individuals who possess two identical genes for a particular trait
A) are homozygous for that trait.
B) are heterozygous for that trait.
C) cannot have offspring of the same phenotype for that trait.
D) cannot have offspring of the same genotype for that trait.
E) none of the above
Answer: A
Diff: 2 Page Ref: 36
Topic: 2.3 Fundamental Genetics
Type: (Factual)

66) If an individual has a recessive phenotype for a particular trait, it can be concluded that
A) both parents also had a recessive phenotype for that trait.
B) only one parent had a recessive phenotype for that trait.
C) both parents were homozygous for the dominant gene for that trait.
D) each parent had at least one recessive gene for that trait.
E) both A and C
Answer: D
Diff: 3 Page Ref: 36
Topic: 2.3 Fundamental Genetics
Type: (Conceptual)
Rationale: To answer this question correctly, students need to understand the relation between the concepts of phenotype and genotype. If a person has a recessive phenotype for a particular trait, they must have two recessive genes for that trait, one from the mother and one from the father.

67) In each cell of the human body, there are normally
A) 21 chromosomes.
B) 21 pairs of chromosomes.
C) 23 genes.
D) 23 chromosomes.
E) 23 pairs of chromosomes.
Answer: E
Diff: 1 Page Ref: 36
Topic: 2.3 Fundamental Genetics
Type: (Factual)

68) Gametes are produced by
A) mitosis.
B) mitotic cell division.
C) meiosis.
D) copulation
E) fertilization.
Answer: C
Diff: 2 Page Ref: 36
Topic: 2.3 Fundamental Genetics
Type: (Factual)

69) Just prior to mitotic cell division, the number of chromosomes in the cell
A) doubles.
B) is reduced by half.
C) doubles twice.
D) stays the same.
E) is increased by 50%.
Answer: A
Diff: 2 Page Ref: 37
Topic: 2.3 Fundamental Genetics
Type: (Factual)

70) The "letters" of the genetic code are
A) deoxyribose bases.
B) phosphates.
C) nucleotide bases.
D) amino acids.
E) peptides.
Answer: C
Diff: 1 Page Ref: 37
Topic: 2.3 Fundamental Genetics
Type: (Factual)

71) How many different nucleotide bases are there in DNA?
A) l
B) 2
C) 4
D) 7
E) 26
Answer: C
Diff: 1 Page Ref: 36
Topic: 2.3 Fundamental Genetics
Type: (Factual)

72) On the DNA molecule, cytosine binds to
A) guanine.
B) adenine.
C) thymine.
D) thiamine.
E) uracil.
Answer: A
Diff: 2 Page Ref: 37
Topic: 2.3 Fundamental Genetics
Type: (Factual)

73) In Down syndrome, there is
A) no guanine.
B) no adenine.
C) no thymine.
D) no cytosine.
E) an extra chromosome in each cell.
Answer: E
Diff: 2 Page Ref: 37-38
Topic: 2.3 Fundamental Genetics
Type: (Applied)

74) Accidental alteration in individual genes during replication is called
A) crossing over.
B) translation.
C) linkage.
D) mutation.
E) self-duplication.
Answer: D
Diff: 2 Page Ref: 38
Topic: 2.3 Fundamental Genetic
Type: (Factual)

75) Illustrated here is
A) mitosis.
B) meiosis.
C) the replication of a DNA molecule.
D) the replication of an RNA molecule.
E) an enhancer.
Answer: C
Diff: 2 Page Ref: 38
Topic: 2.3 Fundamental Genetics
Type: (Factual)

76) Female mammals have
A) only one X chromosome.
B) only one Y chromosome.
C) two X chromosomes.
D) two Y chromosomes.
E) both A and B
Answer: C
Diff: 1 Page Ref: 38
Topic: 2.3 Fundamental Genetics
Type: (Factual)

77) Color blindness occurs more frequently in males than in females because it is
A) dominant.
B) rare.
C) quite common.
D) a recessive sex-linked trait.
E) both A and B
Answer: D
Diff: 3 Page Ref: 38
Topic: 2.3 Fundamental Genetics
Type: (Applied)

78) Sex-linked traits that are controlled by dominant genes occur more frequently in
A) females.
B) males.
C) neural disorders.
D) XY individuals.
E) both B and D
Answer: A
Diff: 3 Page Ref: 38
Topic: 2.3 Fundamental Genetics
Type: (Factual)
Rationale: This is so because most sex-linked traits are controlled by genes on the X chromosome and females have twice as many X chromosomes.

79) Which of the following is a short segment of DNA that determines the rate at which a protein will be synthesized by a particular structural gene?
A) ribosome
B) enhancer
C) codon
D) nucleotide
E) codon segment
Answer: B
Diff: 2 Page Ref: 38
Topic: 2.3 Fundamental Genetics
Type: (Factual)

80) Proteins that bind to DNA and influence the rate at which particular structural genes will be expressed are called
A) transcription factors.
B) autosomes.
C) enhancers.
D) sex-linked traits.
E) mutations.
Answer: A
Diff: 1 Page Ref: 39
Topic: 2.3 Fundamental Genetics
Type: (Factual)

81) DNA is to RNA as
A) guanine is to uracil.
B) thymine is to cytosine.
C) uracil is to thymine.
D) thymine is to uracil.
E) uracil is to guanine.
Answer: D
Diff: 3 Page Ref: 40
Topic: 2.3 Fundamental Genetics
Type: (Conceptual)
Rationale: In order to answer this, students must understand that thymine molecules on strands of DNA are substituted by uracil molecules on strands of RNA.

82) Each codon on a strand of messenger RNA
A) comprises three consecutive bases on the messenger RNA molecule.
B) instructs the ribosome to add one amino acid from the cytoplasm to the growing protein chain.
C) contains all of the information necessary to synthesize a complete protein.
D) both A and B
E) both A and C
Answer: D
Diff: 2 Page Ref: 40
Topic: 2.3 Fundamental Genetics
Type: (Factual)

83) During protein synthesis, each amino acid is carried to the ribosome by
A) a transfer RNA molecule.
B) a codon.
C) a messenger RNA molecule.
D) an operator gene.
E) a mitochondrion.
Answer: A
Diff: 2 Page Ref: 40
Topic: 2.3 Fundamental Genetics
Type: (Factual)

84) Mitochondria are
A) located in the nuclei of cells.
B) located in the cytoplasm of cells.
C) energy-generating structures of cells.
D) both A and C
E) both B and C
Answer: E
Diff: 3 Page Ref: 40
Topic: 2.3 Fundamental Genetics
Type: (Factual)

85) All mitochondrial genes are inherited only
A) if they have first undergone mutation.
B) from one's mother.
C) from one's father.
D) from one's siblings.
E) if they have first been transcribed.
Answer: B
Diff: 2 Page Ref: 40
Topic: 2.3 Fundamental Genetics
Type: (Factual)

86) Arguably, the most ambitious scientific project of all time began in 1990: the
A) American space program.
B) cognitive neuroscience project.
C) human genome project.
D) decade of the brain.
E) theory of evolution.
Answer: C
Diff: 1 Page Ref: 41
Topic: 2.3 Fundamental Genetics
Type: (Factual)

87) Construction of a detailed physical map of human chromosomes
A) began in earnest in 1960.
B) was completed by entirely by American scientists.
C) was completed in 1990.
D) was an attempt to locate all 3 billion human chromosomes.
E) none of the above
Answer: E
Diff: 3 Page Ref: 40
Topic: 2.3 Fundamental Genetics
Type: (Factual)
Rationale: None of these statements is correct; D is incorrect because human DNA contains 3 billion bases, not 3 billion chromosomes.

88) The most surprising finding of the human genome project is that humans have
A) 7-base codons.
B) many mutations.
C) relatively few protein-coding genes.
D) so many genes.
E) more genes than corn has.
Answer: C
Diff: 2 Page Ref: 41
Topic: 2.3 Fundamental Genetics
Type: (Factual)

89) How many structural (protein-coding) genes are there in the human genome?
A) about 20,000
B) 1,000 times more than in the corn genome.
C) 8 times more than in the mouse genome.
D) 38 times more than in the mouse genome.
E) about 3 billion.
Answer: A
Diff: 2 Page Ref: 41
Topic: 2.3 Fundamental Genetics
Type: (Factual)

90) The study of all mechanisms of inheritance other than the classic genetic code and its expression is called
A) Mendelian genetics.
B) the human genome project.
C) pseudogenetics.
D) epigenetics.
E) none of the above
Answer: D
Diff: 3 Page Ref: 41
Topic: 2.3 Fundamental Genetics
Type: (Factual)

91) Epigenetic investigation, although of recent origin, has already identified
A) many active areas of nongene (junk) DNA.
B) various kinds of small RNA molecules.
C) histone remodeling as an important mechanism by which experience can influence gene expression.
D) DNA methylation as an important epigenetic mechanism.
E) all of the above
Answer: E
Diff: 3 Page Ref: 42
Topic: 2.3 Fundamental Genetics
Type: (Factual)

92) RNA editing is an important epigenetic mechanism: It occurs when small RNA molecules act directly on strands of
A) messenger DNA.
B) junk DNA.
C) histone.
D) methylated DNA.
E) messenger RNA.
Answer: E
Diff: 2 Page Ref: 42
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

93) Tryon is famous for

A) twin studies of IQ.
B) selectively breeding so-called maze bright and maze dull strains of rats.
C) studies of genetic mutation.
D) research on bird song.
E) the discovery PKU.
Answer: B
Diff: 2 Page Ref: 43
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

94) Searle (1949) found that, in comparison to maze-dull rats, maze-bright rats were
A) not generally superior in learning ability.
B) less emotional.
C) more emotional.
D) both A and B
E) both A and C
Answer: D
Diff: 3 Page Ref: 44
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

95) Cooper and Zubek (1958) found that maze-bright rats made fewer maze errors than maze-dull rats only if both groups had
A) been reared in an impoverished laboratory environment.
B) been reared in an enriched laboratory environment.
C) been equated for emotionality.
D) received tranquilizers.
E) been pretrained.
Answer: A
Diff: 3 Page Ref: 44
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

96) Which of the following disorders was discovered by Asbjörn Fölling, a Norwegian dentist?
A) schizophrenia
B) Korsakoff's syndrome
C) phenylketonuria
D) Parkinsonism
E) Down syndrome
Answer: C
Diff: 2 Page Ref: 44
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

97) People with phenylketonuria have high levels of urinary

A) PKU.
B) phenylpyruvic acid.
C) phenylalanine hydroxylase.
D) tyrosine.
E) ontogeny
Answer: B
Diff: 3 Page Ref: 44
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Applied)

98) PKU is transmitted by a
A) recessive gene mutation.
B) pair of dominant genes.
C) dominant gene mutation.
D) triad of recessive genes.
E) single extra chromosome 23.
Answer: A
Diff: 2 Page Ref: 44
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

99) People with PKU lack the enzyme
A) that converts phenylalanine to tyrosine.
B) phenylpyruvic acid.
C) phenylalanine hydroxylase.
D) both A and B
E) both A and C
Answer: E
Diff: 3 Page Ref: 45
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Applied)

100) In many modern hospitals, the blood of newborn infants is routinely screened for high levels of
A) phenylalanine.
B) phenylpyruvic acid.
C) phenylalanine hydroxylase.
D) all of the above
E) both B and C
Answer: A
Diff: 3 Page Ref: 45
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Applied)

101) The sensitive period for the development of a particular trait is the period

A) of chronic pain.
B) of sexual receptivity.
C) of fertility.
D) of neural regeneration.
E) during which a particular experience must occur to have a major effect on the development of the trait.
Answer: E
Diff: 1 Page Ref: 44
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

102) The sensitive period for PKU is the early period during which
A) identified sufferers are fed phenylalanine-reduced diets.
B) excessive phenylalanine has substantial effects on neural development.
C) the symptoms of PKU are most severe.
D) both A and B
E) none of the above
Answer: D
Diff: 3 Page Ref: 45
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Applied)

103) The male birds of many species are most likely to learn
A) any birdsong that they hear during the motor phase.
B) the songs of their own species that they hear during the motor phase.
C) any birdsong that they hear during the sensory phase.
D) the songs of their own species that they hear during the sensory phase.
E) any birdsong that they hear once they have reached maturity.
Answer: D
Diff: 3 Page Ref: 45
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

104) The sensorimotor phase of birdsong development
A) occurs just before the sensory phase.
B) begins as soon a bird is hatched.
C) does not exist in male birds.
D) occurs most commonly in females.
E) begins with subsong.
Answer: E
Diff: 3 Page Ref: 45
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

105) The first twittering efforts of young songbirds are often called

A) clucking.
B) sing-song.
C) babbling.
D) subsong.
E) dialectic.
Answer: D
Diff: 2 Page Ref: 45
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

106) Birdsong is commonly studied in male
A) white-crowned sparrows.
B) zebra finches.
C) canaries.
D) all of the above
E) none of the above
Answer: D
Diff: 2 Page Ref: 45
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

107) Zebra finches and white-crowned sparrows are _____ birdsong learners; canaries are _____ birdsong learners.
A) age-limited; open-ended
B) rapid; slow
C) slow; rapid
D) open-ended; age-limited
E) closed-ended; age-limited
Answer: A
Diff: 3 Page Ref: 45
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

108) In many songbirds, the voice box or _____ is a double structure.
A) high vocal center
B) robust nucleus
C) syrinx
D) hypoglossal nucleus
E) archistriatum
Answer: C
Diff: 2 Page Ref: 46
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

109) Canaries can sing with either their left or right hemispheres, but

A) they cannot sing the same song with both at the same time.
B) most have a strong left-hemisphere preference.
C) they cannot sing with their left hemisphere and their syrinx at the same time.
D) most have a strong right-hemisphere preference.
E) they cannot sing with their syrinx.
Answer: B
Diff: 2 Page Ref: 45
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

110) The canary song-control neural circuit is remarkable because the
A) left descending motor circuit plays a greater role than the right.
B) high vocal center is four times larger in males than in females.
C) male song-control brain structures grow each spring.
D) new neurons are added to the male song-control brain structures each spring.
E) all of the above
Answer: E
Diff: 3 Page Ref: 46
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual)

111) Identical is to fraternal as
A) dizygotic is to monozygotic.
B) polyzygotic is to monozygotic.
C) two is to one.
D) culture is to experience.
E) monozygotic is to dizygotic.
Answer: E
Diff: 2 Page Ref: 47
Topic: 2.5 Genetics of Human Psychological Differences
Type: (Factual)

112) The most extensive study of twins reared apart is the
A) British study.
B) Canadian study.
C) New York study.
D) Minnesota study.
E) North African study.
Answer: D
Diff: 1 Page Ref: 47
Topic: 2.5 Genetics of Human Psychological Differences
Type: (Factual)

113) In the Minnesota study, the heritability estimate for IQ was 70%. This means that IQ is

A) 70% genetic.
B) about 30% environmental.
C) about 70% genetic.
D) both B and C
E) none of the above
Answer: E
Diff: 3 Page Ref: 47
Topic: 2.5 Genetics of Human Psychological Differences
Type: (Conceptual)
Rationale: A heritability estimate is a numerical estimate of the proportion of variability among participants that occurred in a particular trait as a result of the genetic variation in that study. It has nothing to do with development in individuals.

114) A heritability estimate is
A) an estimate of the proportion of a trait that is attributable to genetics.
B) an estimate of the proportion of between-subject variability occurring in a particular trait in a particular study that resulted from genetic differences among the subjects of that study.
C) likely to be higher in studies with little environmental variation.
D) both A and C
E) both B and C
Answer: E
Diff: 3 Page Ref: 47
Topic: 2.5 Genetics of Human Psychological Differences
Type: (Conceptual)
Rationale: Students require a sound understanding of the concept of heritability estimates to answer this question. B is the definition of a heritability estimate and C is a point emphasized in the text.

115) In the study of heritability estimates, increasing the genetic diversity of the subjects without introducing other changes would likely
A) decrease the heritability estimate.
B) confound the experiment.
C) increase the accuracy of the heritability estimate.
D) reduce the accuracy of the heritability estimate.
E) increase the heritability estimate.
Answer: E
Diff: 3 Page Ref: 47
Topic: 2.5 Genetics of Human Psychological Differences
Type: (Conceptual)
Rationale: This is an important aspect of heritability estimates that is emphasized in the text.

116) Epigenetic research has found that there are genetic differences between so-called identical twins and that these differences
A) do not occur in fraternal twins.
B) decrease with age.
C) increase with age.
D) increase disease susceptibility.
E) decrease disease susceptibility.
Answer: C
Diff: 2 Page Ref: 48
Topic: 2.5 Genetics of Human Psychological Differences
Type: (Factual)

117) The term *identical twins* should not be used because recent epigenetic research has shown that after conception there is a gradual accumulation of genetic
A) differences between identical twins.
B) similarities between identical twins.
C) differences between identical and fraternal twins
D) similarities between identical and fraternal twins
E) differences between male and female twins.
Answer: A
Diff: 2 Page Ref: 48
Topic: 2.5 Genetics of Human Psychological Differences
Type: (Factual)

117) Pinel ended his discussion of the genetics of human psychological differences with a description of the study of Turkheimer and colleagues (2003). The important finding of this study was that
A) among the very poor, the heritability estimate of IQ was close to zero.
B) among the affluent, the heritability estimate of IQ was close to one.
C) IQ in adult humans is almost entirely genetic.
D) both A and B
E) both B and C
Answer: D
Diff: 3 Page Ref: 48
Topic: 2.5 Genetics of Human Psychological Differences
Type: (Conceptual)
Rationale: The key concept here is that experience can have a huge effect on heritability estimates, which are often assumed to be fixed for each trait.

FILL-IN-THE-BLANK QUESTIONS

1) In the early 20th century, the nature side of the nature-nurture debate was championed by European _____.
Answer: ethologists
Diff: 2 Page Ref: 22
Topic: 2.1 Thinking about the Biology of Behavior
Type: Factual

2) Asomatognosia is typically produced by lesions to the right _____.
Answer: parietal lobe
Diff: 3 Page Ref: 22
Topic: 2.1 Thinking about the Biology of Behavior
Type: Factual

3) Modern biology began in 1859 with the publication of On the _____ by Darwin.
Answer: Origin of Species
Diff: 3 Page Ref: 24

Topic: 2.2 Human Evolution
Type: Factual

4) Social dominance plays a role in evolution because dominant animals tend to produce more _____.
Answer: offspring
Diff: 2 Page Ref: 26
Topic: 2.2 Human Evolution
Type: Factual

5) Mammals evolved from a line of small _____.
Answer: reptiles
Diff: 3 Page Ref: 28
Topic: 2.2 Human Evolution
Type: Factual

6) The first Homo species is thought to have evolved from a species of _____ about 2 million years ago.
Answer: Australopithecus
Diff: 3 Page Ref: 29
Topic: 2.2 Human Evolution
Type: Factual

7) The incidental nonadaptive by-products of an adaptive evolutionary change are called _____.
Answer: spandrels
Diff: 3 Page Ref: 31
Topic: 2.2 Human Evolution
Type: Factual

8) Similarities between _____ structures result from convergent evolution.
Answer: analogous
Diff: 3 Page Ref: 31
Topic: 2.2 Human Evolution
Type: Factual

9) The two genes that control the same trait are called _____.
Answer: alleles
Diff: 2 Page Ref: 36
Topic: 2.3 Fundamental Genetics
Type: Factual

10) All body cells of a human normally contain _____ pairs of chromosomes.
Answer: 23
Diff: 1 Page Ref: 36
Topic: 2.3 Fundamental Genetics
Type: Factual

11) The nucleotide base _____ is found in DNA but not in RNA.
Answer: thymine
Diff: 3 Page Ref: 40
Topic: 2.3 Fundamental Genetics

Type: Factual

12) _____ RNA carries the genetic code from DNA in the nucleus of the cell to the cytoplasm of the cell body.
Answer: Messenger
Diff: 1 Page Ref: 40
Topic: 2.3 Fundamental Genetics
Type: Factual

13) Proteins are long chains of _____.
Answer: amino acids
Diff: 1 Page Ref: 40
Topic: 2.3 Fundamental Genetics
Type: Factual

14) The study of genetics has progressed into the age of _____ , the study of all mechanisms of inheritance other than the genetic code and its expression.
Answer: epigenetics
Diff: 1 Page Ref: 41
Topic: 2.3 Fundamental Genetics
Type: Factual

15) DNA methylation and _____ remodeling are two epigenetic mechanisms.
Answer: histone
Diff: 3 Page Ref: 42
Topic: Fundamental Genetics
Type Factual

16) Maze-bright rats are less _____ than maze-dull rats.
Answer: emotional
Diff: 2 Page Ref: 43
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: Factual

17) Individuals with PKU normally have high levels of _____ in their urine unless they eat a phenylalanine-free diet.
Answer: phenylpyruvic acid
Diff: 3 Page Ref: 44
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: Factual

18) Subsongs mark the beginning of the second phase of birdsong development: the _____ phase.
Answer: sensorimotor
Diff: 2 Page Ref: 45
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: Factual

19) Monozygotic twins are more commonly called _____ twins even though they are not.
Answer: identical
Diff: 1 Page Ref: 47
Topic: 2.5 Genetics of Human Psychological Differences

Type: Factual

18) Turkheimer and colleagues (2003) found that the heritability estimate of IQ among the very poor was close to _____.
Answer: zero
Diff: 3 Page Ref: 48
Topic: 2.5 Genetics of Human Psychological Differences
Type: Factual

ESSAY AND OTHER MULTIPLE-MARK QUESTIONS

1) Discuss the history and current view of the nature-nurture issue.
Answer:
25% for describing the original nature-nurture issue
50% for describing how the nature-nurture issue evolved
25% for explaining the current interaction view of nature and nurture
Diff: 2 Page Ref: 21-24
Topic: 2.1 Thinking about the Biology of Behavior
Type: (Conceptual)

2) Describe the model of the biology of behavior that has been adopted by most biopsychologists. Use a diagram in your answer.
Answer:
50% for a verbal explanation of the model
50% for a diagram of the model
Diff: 3 Page Ref: 24-25
Topic: 2.1 Thinking about the Biology of Behavior
Type: (Conceptual)

3) Briefly summarize the main stages of human evolution beginning 410 million years ago with the evolution of amphibians.
Answer:
20% for describing the emergence of amphibians
20% for describing the emergence of reptiles
20% for describing the emergence of mammals
20% for describing the emergence of hominids
20% for describing the emergence of humans
Diff: 3 Page Ref: 27-30
Topic: 2.2 Human Evolution
Type: (Factual)

4) Describe and discuss four often-misunderstood points about evolution. Be sure to explain both the misconception and the modern view.
Answer:
50% for explaining four common misconceptions about evolution
50% for explaining the modern view that has replaced each of the four misconceptions
Diff: 2 Page Ref: 30-31
Topic: 2.2 Human Evolution
Type: (Conceptual)

5) Describe how structural genes are expressed, that is, transcribed and then translated into proteins. Use a diagram in your answer.
Answer:
25% for describing the transcription of mRNA
50% for describing the translation of mRNA to protein
25% for a diagram of the process
Diff: 2 Page Ref: 38-40
Topic: 2.3 Fundamental Genetics
Type: (Factual)

6) Discuss the human genome project and its major findings. What research has been stimulated by the major finding of the human genome project?
Answer:
25% for describing the human genome project
25% for describing the major findings of the human genome project
25% for describing how the human genome project led to the birth of epigenetics
25% for explaining the limitations of the human genome project in furthering understanding of behavior
Diff: 3 Page Ref: 41
Topic: 2.3 Fundamental Genetics
Type: (Factual, Conceptual)

7) Discuss the interaction of genetic factors and experience in behavioral ontogeny by describing two examples and the key findings that revealed the interactions.
Answer:
50% for describing the genetics of two of maze brightness, PKU, or bird song
50% for describing the interaction of genetic factors and experience for two selected examples
Diff: 2 Page Ref: 43-46
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual, Conceptual)

8) Discuss the behavioral genetics of individual differences, being sure to focus on common misunderstandings about heritability estimates.
Answer:
25% for defining heritability estimates
75% for explaining common misconceptions about heritability estimates and contrasting them with more reasonable views.
Diff: 3 Page Ref: 46-48
Topic: 2.4 Behavioral Development: Genetic Factors and Experience
Type: (Factual, Conceptual)