

CHAPTER 1: ORIGINS OF BEHAVIORAL NEUROSCIENCE

1.1 Multiple Choice

- 1) The mind-body solution proposed by René Descartes was inspired by
- A) visions he had while suffering a nervous breakdown in his teen years.
 - B) his daughter Francine.
 - C) his observation of mechanical statues in a royal garden.
 - D) his training as a philosopher.
 - E) his training in music.

Answer: C

Diff: 1 Page Ref: 2 Objective: Applied

- 2) _____ refers to the ancient belief that spirits control the movements of inanimate objects.

- A) Spiritualism
- B) Dualism
- C) Monism
- D) Animism
- E) Theism

Answer: D

Diff: 1 Page Ref: 2 Objective: Factual

- 3) The notion that human behavior can be explained by spirits is termed

- A) anarchy.
- B) dualism.
- C) animism.
- D) theological evolution.
- E) symbolic representation.

Answer: C

Diff: 1 Page Ref: 2 Objective: Conceptual

- 4) The fact that humans have a thirst for knowledge of how things work is an example of

- A) empathy.
- B) spiritualism.
- C) monism.
- D) animism.
- E) curiosity.

Answer: E

Diff: 1 Page Ref: 2 Objective: Factual

- 5) The author's meaning of "consciousness" is consistent with our

- A) being awake.
- B) ability to detect stimuli that are present in the outside world.
- C) ability to move our bodies.
- D) ability to communicate our thoughts and feelings to others.
- E) possessing a complicated nervous system.

Answer: D

Diff: 3 Page Ref: 3 Objective: Conceptual

6) Which of the following is consistent with the proposition that consciousness is a physiological function?

- A) Consumption of ethanol changes our ability to communicate our thoughts to others.
- B) Damage to the brain can alter our self-awareness.
- C) Inhalation of certain gases renders us unaware of the environment.
- D) Our awareness levels change with the activity of our brains.
- E) All of the above are correct.

Answer: E

Diff: 3 Page Ref: 3 Objective: Conceptual

7) Carlson argues that a key aspect of human consciousness is related to

- A) our ability to communicate to others via language.
- B) our ability to sleep at night.
- C) the fact that humans are awake during the day.
- D) the observation that brain damage can alter our awareness.
- E) our ability to react to painful stimuli.

Answer: A

Diff: 2 Page Ref: 3 Objective: Applied

8) Epileptic seizures can be controlled by

- A) administration of drugs such as cocaine or amphetamine.
- B) drugs that block the action of acetylcholine in the brain.
- C) removal of the cerebral cortex.
- D) cutting the corpus callosum.
- E) electrical stimulation of sub-cortical brain structures.

Answer: D

Diff: 3 Page Ref: 4 Objective: Applied

9) An important function of the corpus callosum is to

- A) channel sensory information to the thalamic relay centers.
- B) control the movement of the hands and fingers.
- C) interconnect the cerebral hemispheres.
- D) control the release of neurohormones from the pituitary.
- E) channel motor information to the spinal cord.

Answer: C

Diff: 2 Page Ref: 4 Objective: Conceptual

10) Transection of the _____ may be useful for reducing the symptoms of _____.

- A) corpus callosum; epilepsy
- B) fornix; obsessive-compulsive disorder
- C) stria terminalis; anterograde amnesia
- D) fornix; depression
- E) corpus callosum; anxiety

Answer: A

Diff: 2 Page Ref: 4 Objective: Factual

11) Surgical transection of the corpus callosum is intended to

- A) reduce swelling of the brain in hydroencephalus.
- B) alter long-term memory of traumatic events.
- C) promote the development of the frontal lobes.
- D) reduce the severity of epileptic seizures.
- E) prevent the development of Parkinson's disease.

Answer: D

Diff: 1 Page Ref: 4 Objective: Factual

12) In most persons, the left hemisphere of the brain

- A) controls the left side of the body.
- B) controls speech.
- C) is involved in spatial perception.
- D) receives tactile information from the left side of the body.
- E) receives olfactory information from the right nostril.

Answer: B

Diff: 3 Page Ref: 4 Objective: Conceptual

13) Which of the following would be expected of a person who has undergone the "split-brain" procedure?

- A) more intense epileptic seizures
- B) poor motor balance
- C) putting down an interesting book held in his or her right hand
- D) making obscene gestures with his or her left hand at unexpected times
- E) diminished capacity to reason

Answer: D

Diff: 3 Page Ref: 4 Objective: Applied

14) Which of the following functions is associated with the right hemisphere?

- A) the control of muscles of the left side of the body
- B) the processing of olfactory signals from the left nostril
- C) the processing of tactile signals from the right side of the body
- D) the motor control of the right side of the body
- E) the capacity to feel emotion

Answer: A

Diff: 2 Page Ref: 4–5 Objective: Factual

15) A person has undergone the "split-brain" procedure to treat a clinical disorder. After her left nostril is plugged with cotton, the scent of a flower is directed to her right nostril. We would expect this odor to

- A) generate a sensory message in the left hemisphere of her brain.
- B) generate a sensory message in both hemispheres of this person's brain.
- C) lead that person to report the smell of a flower.
- D) fail to generate a verbal report of the sensory experience.
- E) Both B and C are correct.

Answer: D

Diff: 3 Page Ref: 4–5 Objective: Applied

- 16) The scent of a flower sniffed through the right nostril in a "split-brain" person would be expected to
- A) generate a sensory message in the left hemisphere of the brain.
 - B) generate a sensory message in both hemispheres of the brain.
 - C) lead that person to report the smell of a flower.
 - D) allow that person to use his or her left hand to choose a hidden plastic flower.
 - E) Both B and C are correct.

Answer: D

Diff: 3 Page Ref: 4–5 Objective: Applied

- 17) Which of the following is true of the right hemisphere?
- A) This hemisphere controls speech.
 - B) It receives olfactory information from the right nostril.
 - C) It receives tactile information from the right side of the body.
 - D) It controls the muscles on the right side of the body.
 - E) It receives olfactory information from the left nostril.

Answer: B

Diff: 2 Page Ref: 4–5 Objective: Conceptual

- 18) _____ is a type of explanation used by scientists.

- A) Generalization
- B) Induction
- C) Reduction
- D) Syllogism
- E) A and C are correct.

Answer: E

Diff: 2 Page Ref: 6 Objective: Conceptual

- 19) A psychologist who argues that phobias are actually learned fears is using the process of

- A) rationalization.
- B) pseudoscience.
- C) reductionism.
- D) generalization.
- E) Both A and B are correct.

Answer: D

Diff: 1 Page Ref: 6 Objective: Applied

- 20) A complex phenomenon that is explained using simpler phenomena is based on the process of

- A) rationalization.
- B) simplification.
- C) generalization.
- D) deduction.
- E) reduction.

Answer: E

Diff: 2 Page Ref: 6 Objective: Factual

21) Dr. Leary argues that the additional "energy" a person experiences after ingesting the drug ecstasy results because ecstasy stimulates dopamine neurons in brain. His explanation would invoke the process of

- A) reduction.
- B) syllogism.
- C) generalization.
- D) induction.
- E) superordinate causality.

Answer: A

Diff: 3 Page Ref: 6 Objective: Applied

22) Which of the following is NOT correct?

- A) Reduction uses simple processes to explain complicated ones.
- B) The goal of science is to understand a phenomenon under study.
- C) Generalization and reduction are important tools in science.
- D) Physiological psychologists only use reductionistic explanations.
- E) Science involves testing hypotheses.

Answer: D

Diff: 3 Page Ref: 6 Objective: Conceptual

23) A serious complication of physiological analyses of behavior is that

- A) behaviors have to be explained in terms of molecular events.
- B) different physiological mechanisms may produce identical behaviors.
- C) identical behaviors may occur for different reasons.
- D) physiologists are only able to offer reductionist explanations.
- E) B and C are correct.

Answer: E

Diff: 3 Page Ref: 6 Objective: Conceptual

24) René Descartes would be most comfortable with which of the following statements?

- A) The universe is a mental construction.
- B) The body is a hallucination generated by the mind.
- C) The body is made of matter; the mind is not.
- D) Everything is made of matter and energy.
- E) Reflexes are noted in humans, but not in animals.

Answer: C

Diff: 2 Page Ref: 7 Objective: Applied

25) Which of the following statements is consistent with how a physiological psychologist would solve the mind-body problem?

- A) The mind is a product produced by the operations of the nervous system.
- B) The body can influence the mind through the actions of the pineal gland.
- C) The mind is spiritual, while the body is made from matter.
- D) The mind can exist apart from the body.
- E) The body is physical, but the mind is not.

Answer: A

Diff: 3 Page Ref: 7 Objective: Conceptual

26) The mind-body problem

- A) asks about the nature of the mind and the body.
- B) was originally posed by philosophers.
- C) remains unanswered.
- D) raises issues about the nature of consciousness.
- E) All of the above are correct.

Answer: E

Diff: 2 Page Ref: 7 Objective: Conceptual

27) A physiological psychologist would be most comfortable with which of the following statements?

- A) The universe is a mental construction.
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- C) The body is made of matter; the mind is not.
- D) Everything is made of matter and energy.
- E) The body is physical and the mind is spiritual.

Answer: D

Diff: 2 Page Ref: 7 Objective: Applied

28) Ancient Egyptian and Chinese cultures viewed the _____ as the seat of thought and emotion.

- A) gut
- B) heart
- C) brain
- D) pineal gland
- E) stomach

Answer: B

Diff: 1 Page Ref: 7 Objective: Factual

29) Which of the following philosophers/scientists attributed thought and emotion to the brain?

- A) Aristotle
- B) Galen
- C) Hippocrates
- D) Plato
- E) Müller

Answer: C

Diff: 3 Page Ref: 7 Objective: Applied

30) Aristotle argued that

- A) the brain is the seat of thought, but not emotion.
- B) the brain serves to cool the passions of the heart.
- C) the brain is the seat of emotion, but not thought.
- D) the brain routes sensory information to the heart.
- E) injury to the brain alters emotion and thought.

Answer: B

Diff: 2 Page Ref: 7 Objective: Applied

31) René Descartes argued that

- A) the mind is an emerging property of organization of the brain.
- B) only humans are capable of reflexive behaviors.
- C) the brain acts to cool the passions of the heart.
- D) animals are mechanical devices whose behavior is controlled by environmental stimuli.
- E) humans cannot understand the nature of the real world.

Answer: D

Diff: 2 Page Ref: 7 Objective: Applied

32) A reflex is considered to be a(n) _____ movement elicited by an _____.

- A) involuntary; external stimulus
- B) voluntary; internal stimulus
- C) conscious; external stimulus
- D) unconscious; internal stimulus
- E) None of the above are correct.

Answer: A

Diff: 2 Page Ref: 7 Objective: Conceptual

33) Which scientist coined the term "reflexes" to describe certain bodily movements?

- A) Aristotle
- B) René Descartes
- C) Hermann von Helmholtz
- D) Wilder Penfield
- E) Luigi Galvani

Answer: B

Diff: 1 Page Ref: 7 Objective: Applied

34) Which of the following terms best describes the mind-body view held by René Descartes?

- A) Monist
- B) Reductionist
- C) Pluralist
- D) Dualist
- E) Animist

Answer: D

Diff: 2 Page Ref: 7 Objective: Applied

35) _____ is considered to be the father of modern philosophy.

- A) Sigmund Freud
- B) Hippocrates
- C) Aristotle
- D) René Descartes
- E) Wilhelm Wundt

Answer: D

Diff: 1 Page Ref: 7 Objective: Applied

36) According to René Descartes,

- A) the heart is the organ that controls emotions.
- B) the muscles are activated by electrical signals carried by nerves.
- C) nerves carry electrical messages that contract muscles.
- D) a reflex is a sensory perception generated by the mind.
- E) the mind controls the movements of the body.

Answer: E

Diff: 3 Page Ref: 7 Objective: Applied

37) For Descartes, the statues in the royal garden provided a(n) _____ for explaining how the mind controls behavior.

- A) model
- B) analogy
- C) generalization
- D) prototype
- E) syllogism

Answer: A

Diff: 2 Page Ref: 8 Objective: Applied

38) A(n) _____ is a simple system that works on known principles that can be used to explain a complex system.

- A) model
- B) analogy
- C) generalization
- D) prototype
- E) syllogism

Answer: A

Diff: 2 Page Ref: 8 Objective: Factual

39) Galvani's experiment showed that _____ of a frog nerve caused _____ of the attached muscle.

- A) electrical stimulation; relaxation
- B) electrical stimulation; contraction
- C) chemical stimulation; contraction
- D) pressurization; relaxation
- E) chemical stimulation; relaxation

Answer: B

Diff: 2 Page Ref: 8 Objective: Applied

40) The significance of Galvani's experiment involving stimulation of an isolated frog muscle is that it proved that

- A) fluid flow along nerves causes muscles to contract.
- B) the muscles are activated by electrical nerve signals.
- C) reflexes can be explained using a hydraulic model.
- D) a reflex is a process controlled by the mind.
- E) the mind controls the movements of the body.

Answer: B

Diff: 3 Page Ref: 8 Objective: Applied

41) Which of the following is NOT consistent with Descartes's explanation of the mind-body problem?

- A) The brain contains fluid-filled chambers.
- B) Nerves are filled with fluid and are under pressure.
- C) Muscles move the body.
- D) Electrical stimulation of a nerve can evoke contraction of a muscle, even when the nerve has been disconnected from the rest of the body.
- E) The brain controls the muscles of the body.

Answer: D

Diff: 3 Page Ref: 8 Objective: Applied

42) The doctrine of specific nerve energies was proposed by

- A) Johannes Müller.
- B) Paul Broca.
- C) René Descartes.
- D) Hippocrates.
- E) Wilhelm Wundt.

Answer: A

Diff: 1 Page Ref: 8 Objective: Applied

43) Which of the following is consistent with the doctrine of specific nerve energies?

- A) Electrical stimulation of a sensory nerve can evoke a specific sensation.
- B) All nerves carry a similar electrical message.
- C) Exerting pressure on the eyeball can evoke a sensation of light flashes.
- D) The brain is divided into different channels and regions by function.
- E) All of the above are correct.

Answer: E

Diff: 3 Page Ref: 8 Objective: Conceptual

44) _____ was among the first scientists to advocate the use of experimental techniques in the study of physiology.

- A) Paul Broca
- B) René Descartes
- C) Sigmund Freud
- D) Johannes Müller
- E) Charles Darwin

Answer: D

Diff: 2 Page Ref: 8 Objective: Applied

45) Johannes Müller proposed

- A) an important role for natural selection in the evolution of behavior.
- B) that language is a function of the right hemisphere.
- C) that different brain channels carry out different functions.
- D) that the pineal body interconnects the body with the mind.
- E) that the amygdala controls thought and emotion.

Answer: C

Diff: 2 Page Ref: 8 Objective: Applied

46) Pierre Flourens is known

- A) for his development and use of the experimental ablation technique.
- B) as the father of modern philosophy.
- C) for creating the theory of evolution.
- D) for his study of the impairment of language in stroke victims.
- E) as a radical philosopher who rejected the study of the mind-body problem.

Answer: A

Diff: 2 Page Ref: 8–9 Objective: Applied

47) Experimental ablation involves

- A) comparisons of brain size differences across species.
- B) measurements of conduction velocity rates in damaged and intact nerves.
- C) chronic chemical stimulation of the brain.
- D) low-level electrical stimulation of the brain.
- E) the study of changes in function after intentional damage to a portion of the brain.

Answer: E

Diff: 3 Page Ref: 8–9 Objective: Conceptual

48) Based on his observation of brain damage and behavioral difficulties in a stroke victim, Paul Broca concluded that

- A) the control of speech is a function of the left hemisphere.
- B) the right hemisphere controls motor movements on the right side of the body.
- C) damage to the right hemisphere impairs speech.
- D) different regions of the brain control heart rate and breathing, purposeful movements, and sensory function.
- E) muscle atrophy after a stroke results from a loss of fluid pressure within the brain ventricles.

Answer: A

Diff: 3 Page Ref: 9 Objective: Applied

49) Electrical stimulation of the _____ in dogs was shown by Fritsch and Hitzig in 1870 to result in _____.

- A) pineal gland; contraction of the facial muscles
- B) parietal cortex; the sensation of high frequency sound
- C) corpus callosum; paralysis of both hind legs
- D) primary motor cortex; muscle contraction on the opposite side of the body
- E) left globus pallidus; atrophy of muscles on the right side of the body

Answer: D

Diff: 2 Page Ref: 9 Objective: Applied

50) Among the contributions of Hermann von Helmholtz to science is

- A) a mathematical formula to describe the conservation of energy.
- B) a theory of color vision.
- C) his invention of the ophthalmoscope.
- D) measuring the conduction speed through nerves of the action potential.
- E) All of the above are correct.

Answer: E

Diff: 2 Page Ref: 9 Objective: Applied

51) In his studies of nerve conduction, Hermann von Helmholtz noted that

- A) electrical signal speeds differ from nerve to nerve.
- B) nerve signal conduction is at the speed of light.
- C) nerves conduct signals faster than do electrical wires.
- D) nerves conduct signals more slowly than wires conduct electricity.
- E) different sensory systems use different conduction speeds.

Answer: D

Diff: 2 Page Ref: 9 Objective: Applied

52) Darwin proposed the principle of

- A) specific nerve energy.
- B) homeostasis.
- C) experimental ablation.
- D) natural selection.
- E) B and D are correct.

Answer: D

Diff: 2 Page Ref: 11 Objective: Applied

53) Darwin's view that the natural characteristics of an organism exert useful effects is termed

- A) reductionism.
- B) positivism.
- C) functionalism.
- D) consolidation.
- E) adaptation.

Answer: C

Diff: 2 Page Ref: 10 Objective: Applied

54) The principles of natural selection and evolution were proposed by

- A) Paul Broca.
- B) René Descartes.
- C) Sigmund Freud.
- D) Johannes Müller.
- E) Charles Darwin.

Answer: E

Diff: 2 Page Ref: 11–12 Objective: Applied

55) The physiological mechanisms of an organism can modulate behavior. Strictly speaking, these mechanisms

- A) can be said to have purpose.
- B) can be traced or linked to certain functions.
- C) are thought to be different from species to species.
- D) are not thought to be subject to evolution.
- E) are present at birth and do not require environmental stimulation for complete expression.

Answer: B

Diff: 3 Page Ref: 10 Objective: Conceptual

56) Which of the following is consistent with Blest's (1957) study of the impact of background pattern on consumption of worms by birds?

- A) Background pattern made no difference in this study.
- B) Birds avoided backgrounds that resembled the bark of a tree.
- C) Worms were most likely to be eaten when placed on a background that contained a pattern that resembled an eye of an owl.
- D) Birds rapidly approached backgrounds that contained eyespot patterns.
- E) Backgrounds that contained eyespot patterns were avoided by the birds.

Answer: E

Diff: 3 Page Ref: 11 Objective: Applied

57) The principle of natural selection proposes that certain characteristics will become more prevalent in a species to the extent that these

- A) are associated with multiple genetic mutations.
- B) inhibit reproductive behaviors.
- C) increase the likelihood that an organism will successfully reproduce.
- D) impair adaption to the local environment.
- E) impair appetite.

Answer: C

Diff: 3 Page Ref: 11 Objective: Conceptual

58) Which of the following is true of genetic mutations?

- A) Mutations have mostly beneficial effects.
- B) Mutations commonly increase the survivability of affected offspring.
- C) Mutations rarely result in problems for the affected offspring.
- D) Most mutations are deleterious.
- E) Mutations cannot confer selective advantages to the affected offspring.

Answer: D

Diff: 3 Page Ref: 11–12 Objective: Conceptual

59) Genetic mutations involve

- A) adverse neural development caused by drug ingestion in adulthood.
- B) accidental changes in the chromosomes of sperms or eggs.
- C) poor adaptation to the environment.
- D) improved reproductive success.
- E) only beneficial changes in the characteristics of an organism.

Answer: B

Diff: 3 Page Ref: 11–12 Objective: Conceptual

60) Traits that can be altered via genetic mutations

- A) are mostly beneficial to members of the species.
- B) are psychological in nature.
- C) are physical in nature.
- D) exert direct actions on behavior.
- E) A and D are correct.

Answer: C

Diff: 2 Page Ref: 11–12 Objective: Factual

- 61) Genetic variety is good for a species in that
- A) such diversity allows some members of the species to adapt to a new environment.
 - B) mutations are kept to a minimum.
 - C) variety promotes neural development.
 - D) variety reduces reproductive success.
 - E) None of the above are correct.

Answer: A

Diff: 3 Page Ref: 12 Objective: Conceptual

- 62) The process of evolution
- A) cannot involve genetic mutations.
 - B) can occur in the absence of natural selection.
 - C) implies genetic diversity.
 - D) refers to a gradual change in the structure and function of a species.
 - E) C and D are correct.

Answer: E

Diff: 3 Page Ref: 12 Objective: Conceptual

- 63) _____ were the first vertebrates to make the shift from living in the sea to living on the land.

- A) Crocodiles
- B) Turtles
- C) Small sea urchins
- D) Reptiles
- E) Amphibians

Answer: E

Diff: 2 Page Ref: 12 Objective: Factual

- 64) The first primates
- A) were able to climb trees.
 - B) were relatively small compared to other species.
 - C) dined on insects.
 - D) were able to grasp objects with their hands.
 - E) All of the above are correct.

Answer: E

Diff: 2 Page Ref: 13–14 Objective: Factual

- 65) Certain mammals survived the mass extinction produced by dust clouds some 65 million years ago because they were able to

- A) see well during the day.
- B) maintain their body temperature in a cold environment.
- C) eat plants as well as meat.
- D) breed during the night.
- E) secrete tears to clear dust from their eyes.

Answer: B

Diff: 2 Page Ref: 13 Objective: Applied

66) Which of the following is an advantage associated with the development of color vision in primates?

- A) the ability to avoid predators in the dark
- B) the ability to freely move in the forest at night
- C) the capacity to discriminate ripe from unripe fruit
- D) the capacity to communicate using verbal signals
- E) All of the above are correct.

Answer: C

Diff: 3 Page Ref: 14 Objective: Conceptual

67) Which of the following is correct regarding the genetic similarities evident among the various members of the primate families?

- A) Members of the primate family share 78.8 percent of their DNA.
- B) Humans and chimpanzees share 98.8 percent of their DNA.
- C) Chimpanzees and gorillas share 50 percent of their genes.
- D) Humans share only 1.2 percent of their genes with other primates.
- E) There is little genetic similarity between the primate groups.

Answer: B

Diff: 2 Page Ref: 14 Objective: Factual

68) Which of the following is true of the hominid species?

- A) *Homo erectus* made tools from stone.
- B) *Homo sapiens* eventually killed off *Homo neanderthal* through armed conflicts.
- C) *Homo neanderthal* left Africa around 1.7 million years ago.
- D) Modern humans are known as *homo sapiens*.
- E) B and C are correct.

Answer: D

Diff: 3 Page Ref: 14 Objective: Factual

69) A larger brain allowed for the development of which of the following capacities and abilities?

- A) the ability to use tools to create shelter
- B) use of color vision to identify ripe food
- C) use of language to signal information to other members of the group
- D) the ability to gather roots and hunt for food
- E) All of the above are correct.

Answer: E

Diff: 2 Page Ref: 14–15 Objective: Conceptual

70) _____ refers to the concept in which maturation is extended, and the brain of an adolescent reaches its adult brain size.

- A) Adaptation
- B) Mutation
- C) Trisomy 21
- D) Neoteny
- E) Allodyny

Answer: D

Diff: 2 Page Ref: 15 Objective: Factual

71) Which of the following is true with regard to the use of animals by humans?

- A) Owning a pet requires permission from a veterinarian.
- B) Pet homes are regularly inspected by the government.
- C) More suffering occurs through pet ownership than with research.
- D) More animals die in research projects than die as pets.
- E) No animal research has been useful for understanding and treating human disease.

Answer: C

Diff: 2 Page Ref: 17 Objective: Factual

72) Animal rights activists are most concerned with our use of animals

- A) in hunting and trapping.
- B) as a source of food.
- C) as companions or pets to humans.
- D) as a source of fur for coats.
- E) as subjects for research.

Answer: E

Diff: 2 Page Ref: 17 Objective: Factual

73) Which of the following is an indispensable use of animals for humans?

- A) research for the treatment of human disease
- B) as a source of food
- C) as companions to humans
- D) as a source of fur
- E) B and C are correct.

Answer: A

Diff: 2 Page Ref: 17 Objective: Factual

74) Research involving animals was required in order to study and develop treatments for which of the following human diseases?

- A) drug addiction
- B) stroke
- C) schizophrenia
- D) obesity
- E) All of the above are correct.

Answer: E

Diff: 2 Page Ref: 18 Objective: Conceptual

75) L-DOPA is a standard treatment for

- A) epilepsy.
- B) stroke.
- C) obesity.
- D) Parkinson's disease.
- E) anorexia nervosa.

Answer: D

Diff: 2 Page Ref: 18 Objective: Applied

76) Which of the following is the easiest justification for the use of animals in research?

- A) Animal research is conducted so as to minimize suffering.
- B) Animal research is an important part of our pursuit of knowledge.
- C) Animal research has led to disease discoveries and treatments that would not otherwise be possible.
- D) One simply has a conversation with an animal rights activist about the validity of animal research.
- E) All of the above are correct.

Answer: C

Diff: 3 Page Ref: 18 Objective: Conceptual

77) _____ is the original name for the field which involves the study of the physiology of behavior.

- A) Behavioral neuroscience
- B) Biopsychology
- C) Psychobiology
- D) Physiological psychology
- E) Biological pseudoscience

Answer: D

Diff: 1 Page Ref: 19 Objective: Factual

78) _____ are physicians trained to diagnose and to treat diseases of the central nervous system.

- A) Psychologists
- B) Neurologists
- C) Anatomists
- D) Behavioral neuroscientists
- E) Experimental neuropsychologists

Answer: B

Diff: 2 Page Ref: 19 Objective: Factual

79) Which of the following was NOT a strategy advocated by the text author to assist you in learning the material of this text?

- A) Focus on the conclusions of a series of studies, not on the premises that support the conclusion.
- B) Each chapter section should be read several times.
- C) Do not use a highlighter to emphasize a text concept.
- D) Be active in your study of the text material.
- E) Make use of the study guide.

Answer: A

Diff: 2 Page Ref: 20–22 Objective: Factual

80) Recent models of the nervous system have tried to understand the brain in terms of

- A) mechanical devices such as levers and fulcrums.
- B) the functions of computer programs.
- C) the flow of hydraulic fluid through nerves.
- D) wiring patterns used to produce telephone networks.
- E) A and C are correct.

Answer: B

Diff: 2 Page Ref: 22 Objective: Conceptual

1.2 True-False

1) Animism is the belief that the mind is separate from the body.

Answer: FALSE

Diff: 1 Page Ref: 2

2) The author argues that consciousness is associated with the ability of humans to use language for communication.

Answer: TRUE

Diff: 1 Page Ref: 3

3) The severity of epilepsy may be reduced by surgical transection of the corpus callosum.

Answer: TRUE

Diff: 1 Page Ref: 4

4) An important function of the corpus callosum is to permit sharing of information between the two hemispheres of the brain.

Answer: TRUE

Diff: 1 Page Ref: 4

5) Scientific explanations consist of generalizations and reductions.

Answer: TRUE

Diff: 2 Page Ref: 6

6) An example of generalization is the explanation of gravitation in terms of forces and subatomic particles.

Answer: FALSE

Diff: 1 Page Ref: 6

7) The term "reflex" refers to an automatic movement.

Answer: TRUE

Diff: 1 Page Ref: 7

8) René Descartes was an influential advocate for using experimental techniques to study the physiology of the mind.

Answer: FALSE

Diff: 2 Page Ref: 7–8

9) Fritsch and Hitzig used electrical stimulation to locate the primary motor cortex in a dog brain.

Answer: TRUE

Diff: 1 Page Ref: 9

10) Helmholtz was the first to accurately measure the speed of conduction in nerves.

Answer: TRUE

Diff: 2 Page Ref: 9

11) The physiological mechanisms of living organisms have a purpose.

Answer: FALSE

Diff: 3 Page Ref: 10

12) The principle of natural selection is the cornerstone of Darwin's theory of evolution.

Answer: TRUE

Diff: 2 Page Ref: 11

13) Humans and chimpanzees share 98.8 percent of their DNA.

Answer: TRUE

Diff: 1 Page Ref: 14

14) Modern humans are known as *homo sapiens*.

Answer: TRUE

Diff:1 Page Ref:14

15) More animals are killed by scientists in laboratory research than for any other reason.

Answer: FALSE

Diff: 2 Page Ref: 17

16) Nicholl and Russell's research indicates that animal rights activists are most concerned with the use of animals as research subjects.

Answer: TRUE

Diff: 2 Page Ref: 17

Objective: Factual

17) The broad field of neuroscience contains the specialty field of physiological psychology.

Answer: TRUE

Diff: 1 Page Ref: 19

18) Most psychologists are physicians.

Answer: FALSE

Diff: 1 Page Ref: 19

19) Computer programs have been used as a model of brain function.

Answer: TRUE

Diff: 2 Page Ref: 22

1.3 Short Answer Essay

1) Discuss evidence that suggests consciousness is a physiological function.

Answer: Consciousness appears to be localized to discrete circuits and to allow us to more readily adapt to new environments. Brain damage can alter consciousness, as in the case of the "split-brain" syndrome.

Diff: 3 Page Ref: 3–5

2) Explain why consciousness is NOT a general property of the entire brain.

Answer: Persons with a transection of the corpus callosum are aware of an object (i.e., they can reach for the object with the appropriate hand) but are unable to state that they can view the object.

Diff: 2 Page Ref: 5

3) Describe the implications of Galvani's research for Descartes's view of how nerves control muscle activity.

Answer: Galvani was able to contract the frog muscle via electrical stimulation when the muscle was detached from the body—thus it was not pressure exerted from the brain which caused muscle contraction.

Diff: 2 Page Ref: 8

4) Explain what Darwin meant by his principle of natural selection.

Answer: The basic notion is that animals differ in a number of characteristics. As the environment changes, some of these animals will more successfully adapt and will pass on their genes to their offspring. Over time, such characteristics will increase in the population.

Diff: 2 Page Ref: 11

5) Discuss a role that mutations play in the process of natural selection.

Answer: Mutations may result in a favorable state which will help an organism adapt to its environment.

Diff: 2 Page Ref: 11–12

6) Explain how pet ownership is different from the use of animals in research.

Answer: Pet ownership benefits the owner whereas many persons can benefit from research. Pain and suffering is limited and monitored in animal research but not in pet ownership.

Diff: 2 Page Ref: 17

7) How has research on animals helped us to understand human diseases? Give a specific example.

Answer: We are able to test the causes of diseases and to seek treatments for diseases. Stroke research has led to the development of drugs that reduce brain damage caused by anoxia associated with a stroke.

Diff: 2 Page Ref: 18

1.4 Essay

1) Compare and contrast the philosophical positions of animism, dualism, and the modern view held by most physiological psychologists.

Answer: Animism is the view that objects have spirits which move them. Dualism is the philosophical view that mind and brain are separate but interacting. Most physiological psychologists argue that mind is a property of the brain.

Diff: 2 Page Ref: 2, 7–8

2) Identify three contributors to the development of physiology and discuss the implications that their work had for the science of neurophysiology.

Answer: Müller argued for the use of experimental methods to study physiology. Helmholtz developed methods and techniques to study the physiology of vision and audition. Flourens developed the technique of experimental ablation, which can provide insight into the functions of brain regions.

Diff: 2 Page Ref: 8–9

3) Describe the following principles or techniques and identify the researchers who were responsible for their development: experimental ablation and electrical stimulation of the brain.

Answer: Each technique involves the physical manipulation of the brain and allows for an assessment of a change in function after the manipulation. Experimental ablation was developed by Pierre Flourens. Fritsch and Hitzig are known for their use of electrical stimulation of dog cortex to study the neural control of motor behavior.

Diff: 2 Page Ref: 8–9

4) Describe Darwin's principle of natural selection. Give examples of structural and behavioral characteristics that might confer selective advantages to an organism.

Answer: Natural selection suggests that certain characteristics of an organism offer an advantage which allows the organism to reproduce and to pass on that characteristic to their offspring. The coloring of an organism may allow it to blend in to the background, thus escaping detection by predators. The capacity to remain still (i.e., freeze) may similarly allow an organism to avoid predation.

Diff: 1 Page Ref: 10–12

5) Discuss the use of animals in research and the ethical issues associated with such use. Make an argument a) FOR and b) AGAINST their use in research

Answer: A relatively small percentage of animals are used in neuroscience research, and their use must be justified by the gain in knowledge produced by the research. An argument for might focus on the fact that such research may produce benefits which are real and which cannot be realized in any other way. An argument against might suggest that humans and animals are so different that results from animals are not useful for understanding humans.

Diff: 3 Page Ref: 16–18