Chapter 3: BIOLOGICAL PSYCHOLOGY
Essay Questions

1) Discuss the lobes of the cortex including their roles. Name the cortical areas most strongly associated with language and describe the two language deficits associated with damage to these areas.

Answer: Answers will vary but should contain the following for full credit.

--The cortex contains four lobes, each associated with somewhat different functions. The **frontal lobe** lies in the forward part of the brain. The frontal lobe is responsible for motor function, language, and memory, as well as the job of overseeing most other mental functions, which we call executive function. The brain's executive function provides a kind of top-level governance over simpler cognitive functions. In most brains a deep groove, called the central sulcus, separates the frontal lobe from the rest of the neocortex. The **motor cortex** lies next to the central sulcus. Each part of the motor cortex controls a specific part of the body. In front of the motor cortex lies a large expanse of the frontal lobe called the **prefrontal cortex.** One region of the prefrontal cortex, **Broca's area,** plays a key role in language production. People with damage to Broca's area exhibit a speech deficit called **aphasia.** Aphasia, particularly Broca's aphasia, is characterised by difficulties in speaking smoothly and an inability to find certain words. The prefrontal cortex serves additional functions, including memory, abstract thinking, and decision making. The prefrontal cortex also contributes to mood, personality, and self-awareness.

--The **parietal lobe** lies behind the frontal lobe. The part of the parietal lobe that lies next to the motor cortex is somatosensory cortex, devoted to touch. It's sensitive to pressure, temperature, and pain. The parietal lobe plays roles in many kinds of perception. Spatial perception, which is the placement of objects in space, is most frequently associated with the upper part of the parietal lobe. Other parietal lobe functions include the perception of object shape and orientation, the perception of actions of others, and the representation of numbers. The parietal lobe integrates visual and touch inputs with motor outputs every time we reach, grasp, and move our eyes.

--The **temporal lobe** is the site of hearing, understanding language, and storing autobiographical memories. This lobe is separated from the rest of the cortex by the lateral fissure. The top of the temporal lobe contains the auditory cortex, the part of the cortex devoted to hearing. We call the language area in the temporal lobe **Wernicke's area**. Damage to Wernicke's area leads to a unique kind of aphasia characterised by disorganised speech sometimes called “word salad” because the words are haphazardly “tossed” together. The lower part of the temporal lobe contains circuitry critical to storing memories of past autobiographical events.

--At the very back of the brain lies the **occipital lobe,** containing visual cortex, dedicated to vision. Human beings are highly dependent on our visual systems, so it they have a lot of visual cortex.

Question ID: Lil 2ce 3.4-1
Diff: 2
Type: ES
Page Ref: 100, 102-104
Topic: The Central Nervous System: The Command Centre
Skill: Factual

2) You are walking in the woods when, suddenly, you see a snake in your path. It looks dangerous. Upon closer examination you realize it is harmless. Explain the order of activation of the peripheral nervous system and the associated physiological reactions that occurred during this process.

Answer: Answers will vary but should contain the following for full credit.

--The sympathetic nervous system mobilized the fight-or-flight response.

--Since you encountered a threat, the sympathetic nervous system became aroused and prepared you for fighting or fleeing.

--Sympathetic activation triggers the flight-or-fight response, a variety of physical responses including increased heart rate, respiration, and perspiration. Autonomic nerves that reach the heart, diaphragm, and sweat glands control these actions.

--After it was determined that a threat no longer existed, the parasympathetic nervous system kicked in and reverse the physical responses. We started to calm down and things eventually returned to normal.

Question ID: Lil 2ce 3.4-2
Diff: 2
Type: ES
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Conceptual

3) Discuss the various types of neuroimaging techniques, including strengths and weaknesses of each type.

Answer: Answers will vary but should contain the following for full credit.

--The CT scan is a three-dimensional reconstruction of many x-rays taken though a part of the body, such as the brain. It shows much more detail than an individual x-ray.

--The MRI measures the release of energy from water in biological tissues following exposure to a uniform magnetic field. MRI images are superior to CT scans for detecting soft tissues, such as those in the brain. A brain tumour shows up particularly well on an MRI image because a tumour consists of soft tissue.

--Positron emission tomography (PET) is a functional imaging technique, meaning that it measures changes in the brain's activity levels. PET is an invasive tool that requires the injection of glucose-like molecules attached to radiotracers into the patient. Because PET is invasive, researchers later looked for functional imaging methods that wouldn't require injections of radiotracers.

--The fMRI measures the change in blood oxygen level and it's an indirect correlate of neural activity. The fMRI relies on magnetic fields, as does MRI. With fMRI, researchers can snap many scans in rapid succession. As such, the method shows changes in brain activity level over time because it creates a series of images.

--Transcranial magnetic stimulation (TMS) uses strong and rapidly changing magnetic fields to induce electric fields in the brain. Depending on the level of stimulation, TMS can either enhance or interrupt brain function. Some reports suggest that TMS provides relief for depression and may decrease auditory hallucinations. Whereas TMS applies magnetic fields to the brain, magnetoencephalography (MEG) measures tiny magnetic fields, and in this way detects electrical activity in the brain and in the rest of the nervous system. The resulting images produced by MEG reveal patterns of magnetic fields on the surface of the skull. MEG has good spatial resolution and excellent temporal resolution that measure activity changes millisecond by millisecond, whereas PET and fMRI scans measure activity changes second by second.

Question ID: Lil 2ce 3.4-3
Diff: 3
Type: ES
Page Ref: 114-115
Topic: A Tour of Brain Mapping Methods
Skill: Factual

4) Discuss the popular notion that people are either left-brained or right-brained.

Answer: Answers will vary but should contain the following for full credit.

--Despite the great scientific contribution of split-brain studies, the notion that normal people are either “left-brained” or “right-brained” is a myth. According to this myth, left-brained people are scholarly, logical, and analytical, and right-brained people are artistic, creative, and emotional. Yet these claims are vast oversimplifications. After reviewing numerous studies, one researcher concluded that we use both sides of our brains in a complementary way. Furthermore, the corpus callosum and other interconnections ensure that both hemispheres are in constant communication.

-- We can trace the myth of exaggerated right-brain versus left-brain differences to misinterpretations of what scientists reported. Self-help books incorporating the topic flourished. Robert E. Ornstein was among those to promote the idea of using different ways to tap into our creative rights brain versus our intellectual left brains in his 1997 book *The Right Brain: Making Sense of the Hemispheres*. Right brain-oriented educational programs for children sprang up that deemphasised getting the correct answers on tests in favour of developing creative ability. For a mere $195, “whole brain learning” supposedly expanded the mind in new ways using “megasubliminal messages,” heard only by the right or the left brain.

--Although there's nothing wrong with trying to be more creative by using our minds in different ways, using both hemispheres in tandem works far better.

Question ID: Lil 2ce 3.4-4
Diff: 3
Type: ES
Page Ref: 119
Topic: Which Side of Our Brains Do We Use for What?
Skill: Conceptual

5) Discuss how we study heritability.

Answer: Answers will vary but should contain the following for full credit.

--Behaviour genetic designs allow us to estimate the heritability of traits and diseases. By heritability, we mean the extent to which genes contribute to differences in a trait among individuals. Some traits, like height, are highly heritable. In contrast, other traits, like the accent in our speech, are due almost entirely to environment. That’s because our accents are almost entirely a product of the dialect spoken in the community in which we're raised or of having a different

--Heritability isn't as simple a concept as it seems, and it confuses even some psychologists. The first misconception is that heritability applies to a single individual rather than differences among individuals. That's because heritability is a statistic that applies only to groups of people. Heritability tells us about the causes of differences among people, not within a person. A second misconception is that heritability tells us whether a trait can be changed. Many laypeople believe that if a trait is highly heritable, then by definition we can't change it. Yet, logically speaking, heritability says little or nothing about how malleable or alterable a trait is. In fact, a trait can in principle have a heritability of 100 percent, yet still be extremely malleable.

--Scientists estimate heritability by means of one of three behavioural genetic designs: family studies, twin studies, and adoption studies. In such studies, scientists note the presence or absence of a behavioural trait or a psychological disorder among different relatives. These studies determine how much genetics contributes to the expression of that trait or disorder. In a family study, researchers examine the extent to which a trait "runs" or goes together in intact families, those in which all family members are raised in the same home. We can study correlations in a trait between two types of twins. Consequently, if identical twins are more alike on a psychological characteristic, such as intelligence or extraversion, than are fraternal twins, we can infer that this characteristic is genetically influenced. Nevertheless, twin studies hinge on the "equal environments assumption"—the assumption that the environmental influences on the characteristic we're studying are the same on identical as on fraternal twins. Adoption studies, which examine the extent to which children adopted into new homes resemble their adoptive as opposed biological parents. Children adopted into other homes are genetically similar to their biological relatives, but they don't share the same environment with their biological relatives. As a consequence, if adopted children resemble their biological parents on a psychological characteristic, we can typically assume that it's genetically influenced.

Question ID: Lil 2ce 3.4-5
Diff: 2
Type: ES
Page Ref: 122-125
Topic: Behavioural Genetics: How We Study Heritability
Skill: Conceptual

6) Describe the process of how an action potential occurs and what happens to the cell during the action potential.

Answer: Answer: Answers will vary but should contain the following points or gist for full credit.

(1) When the neuron is at rest, meaning that there is no input to the axon, the inside of the axon is charged at –70 millivolts compared to the particles outside the axon.
(2) When the neuron is stimulated, the charge inside the axon is briefly reversed. Positively charged sodium ions enter the axon.
(3) This reversal in charge begins at the soma and travels down the axon.
(4) At the end of the axon, branches ending with synaptic knobs release neurotransmitters.
(5) The membrane of the axon allows positively charged potassium ions to escape, restoring the charge of the cell to –70 millivolts.

Question ID: Lil 2ce 3.4-6

Diff: 3
Type: ES
Page Ref: 93-94
Topic: Electrifying Thought
Skill: Conceptual

7) Describe four of the common neurotransmitters and what their major functional roles are.

Answer: Answer: Answers will vary but should contain the following points for full credit. (any four of the following)

Glutamate: rapidly excites neural activity, relay of sensory information and learning
GABA: inhibits neurons, related to many antianxiety drugs
Acetylcholine: involved with muscle contraction, cortical arousal, and learning/memory
Norepinephrine: involved in cortical arousal, may play a role in disorders
Dopamine: linked to motor function and reward systems, involved with disorders
Serotonin: important for mood regulation, aggression, temperature regulation, & sleep/wake cycles
Endorphins: involved in pain reduction, natural opiates in body
Anandamide: involved with eating, motivation, memory, and sleep (as well as pain reduction), binds to same receptors as the THC in marijuana

Question ID: Lil 2ce 3.4-7
Diff: 2
Type: ES
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Factual

8) Identify any three of the four main components of the limbic system and briefly describe what each is responsible for.

Answer:Answer: Answers will vary but should contain the following points for full credit.

Hypothalamus: regulates and maintains constant internal bodily states by overseeing the endocrine and autonomic nervous systems.

Amygdala: involved in experiencing and recognizing emotions, particularly excitement, arousal and fear

Cingulate cortex: active when we express emotions, regulates the autonomic nervous system, and contributes to social behaviour

Hippocampus: involved in memory functions, including spatial memory, fear conditioning, and forming new memories.

Question ID: Lil 2ce 3.4-8
Diff: 2
Type: ES
Page Ref: 105-106
Topic: The Central Nervous System: The Command Centre
Skill: Factual

9) Identify and describe what the main hormones and functions associated with the following parts of the endocrine system: the pituitary gland, adrenal gland, and sexual reproductive glands.

Answer: Answer: Answers will vary but should contain the following points for full credit.

pituitary: master gland, influenced by oxytocin (stretching the cervix during birth and related to lactation), may play a role in romantic love, pituitary hormones stimulate glands throughout endocrine system to release their respective hormones, also releases growth hormone which influences height.

Adrenal glands: synthesise and release adrenaline (boost energy production in muscles and conserving energy outside of muscles) and cortisol (increases in response to stress, regulates blood pressure, heart functioning and nutrient absorption), and small amounts of androgens

Sexual glands: testosterone (related to increases in sex drive in both men and women) and estrogen (highest around ovulation in females)

Question ID: Lil 2ce 3.4-9
Diff: 2
Type: ES
Page Ref: 110-112
Topic: The Pituitary Gland and Pituitary Hormones
Skill: Factual

10) Discuss how stem cells offer three novel ways of treating neurodegenerative diseases, and why stem cell research is controversial.

Answer: Answer: Answers will vary but should contain the following points for full credit.

Researchers can implant stem cells directly into the host's nervous system and induce them to grow and replace damaged cells. Researchers can genetically engineer stem cells so that the cells can administer gene therapy, that is, provide the patient with

replacement genes. Stem cells can allow scientists to acquire a better understanding of how neurons age. Controversial for ethical reasons—destroying balls of cells that research opponents consider to be early forms of human life.

Question ID: Lil 2ce 3.4-10
Diff: 2
Type: ES
Page Ref: 98-99
Topic: Neural Plasticity: How and When The Brain Changes
Skill: Factual

Chapter 3: BIOLOGICAL PSYCHOLOGY
Fill in the Blank Questions

1) Glial cells provide support for neurons, protect them, and respond to injury among other things.

Question ID: Lil 2ce 3.3-1
Difficulty: 1
Page Ref: 92-93
Topic: Neurons: The Brain's Communicators
Skill: Factual

2) Action potentials are abrupt waves of electric discharge that allow neurons to communicate.

Question ID: Lil 2ce 3.3-2
Difficulty: 1
Page Ref: 93-94
Topic: Electrifying Thought
Skill: Factual

3) The brief time during which another action potential can't occur is called the absolute refractory period.

Question ID: Lil 2ce 3.3-3
Difficulty: 1
Page Ref: 94
Topic: Electrifying Thought
Skill: Factual

4) The process by which the synaptic vesicle engulfs the neurotransmitter is called reuptake.

Question ID: Lil 2ce 3.3-4
Difficulty: 2
Page Ref: 95
Topic: Chemical Communication: Neurotransmission
Skill: Conceptual

5) Neuropeptides are short strings of amino acids found in the nervous system. They act somewhat like neurotransmitters.

Question ID: Lil 2ce 3.3-5
Difficulty: 1
Page Ref: 96
Topic: Chemical Communication: Neurotransmission
Skill: Factual

6) The part of the brain known as the forebrain is the most highly developed area in the human brain.

Question ID: Lil 2ce 3.3-6
Difficulty: 1
Page Ref: 101
Topic: The Central Nervous System: The Command Centre
Skill: Factual

7) The frontal lobe is responsible for motor function, language, and memory, as well as the job of overseeing most other mental functions. We call this ability executive function.

Question ID: Lil 2ce 3.3-7

Difficulty: 1
Page Ref: 102
Topic: The Central Nervous System: The Command Centre
Skill: Factual

8) The large band of fibres connecting the two cerebral hemispheres is called the corpus callosum.
Question ID: Lil 2ce 3.3-8
Difficulty: 1
Page Ref: 101, 118
Topic: The Central Nervous System: The Command Centre
Skill: Factual

9) Sensory information travels to cortical regions that perform more complex functions; we call these areas association cortex, and they play key roles in perception, memory, attention, and conscious awareness.

Question ID: Lil 2ce 3.3-9
Difficulty: 2
Page Ref: 103-104, 117
Topic: The Central Nervous System: The Command Centre & How Much of Our Brain do We Use?
Skill: Factual

10) The pathways emanating from the RAS activate the cortex by increasing the signal-to-noise ratio.

Question ID: Lil 2ce 3.3-10
Difficulty: 2
Page Ref: 107
Topic: The Central Nervous System: The Command Centre
Skill: Factual

11) The cerebral ventricles are the waterways of the CNS (Figure 3.11), which extend throughout the entire brain and spinal cord.

Question ID: Lil 2ce 3.3-11
Difficulty: 2
Page Ref: 101-102
Topic: The Central Nervous System: The Command Centre
Skill: Factual

12) The somatic nervous system carries messages from the CNS to muscles throughout the body.

Question ID: Lil 2ce 3.3-12
Difficulty: 1
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

13) The part of the brain dedicated to emotion is called the limbic system.

Question ID: Lil 2ce 3.3-13
Difficulty: 1
Page Ref: 105
Topic: The Central Nervous System: The Command Centre
Skill: Factual

14) The hypothalamus regulates and maintains constant internal bodily states by overseeing the endocrine and autonomic nervous systems.

Question ID: Lil 2ce 3.3-14
Difficulty: 1

Page Ref: 101, 106
Topic: The Central Nervous System: The Command Centre
Skill: Factual

15) Damage to the hippocampus causes problems with forming new memories, but leaves old memories intact.

Question ID: Lil 2ce 3.3-15
Difficulty: 2
Page Ref: 106
Topic: The Central Nervous System: The Command Centre
Skill: Factual

16) The autonomic nervous system is made up of the sympathetic nervous system and the parasympathetic nervous system.

Question ID: Lil 2ce 3.3-16
Difficulty: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

17) The sympathetic nervous system becomes aroused and prepares animals for the fight-or-flight response.

Question ID: Lil 2ce 3.3-17
Difficulty: 1
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

18) The endocrine system is composed of hormones, blood-borne molecules that influence target tissues.

Question ID: Lil 2ce 3.3-18
Difficulty: 1
Page Ref: 110
Topic: The Endocrine System
Skill: Factual

19) The study of phrenology assessed the bumps on a person's head and attributed various personality traits and abilities as a result of the bumps.

Question ID: Lil 2ce 3.3-19
Difficulty: 1
Page Ref: 113
Topic: A Tour of Brain Mapping Methods
Skill: Factual

20) If you wanted to investigate the possibility of a brain tumour, the best type of neuroimaging would be a(n) MRI.

Question ID: Lil 2ce 3.3-20
Difficulty: 2
Page Ref: 114
Topic: A Tour of Brain Mapping Methods
Skill: Factual

21) The corpus callosum is severed during split-brain surgery.

Question ID: Lil 2ce 3.3-21
Difficulty: 2
Page Ref: 118

Topic: Which Side of Our Brains Do We Use for What?
Skill: Factual

22) People's set of observable traits is their phenotype.

Question ID: Lil 2ce 3.3-22
Difficulty: 2
Page Ref: 121
Topic: How We Come to Be Who We Are
Skill: Factual

23) Scientists use the term "plasticity" to describe the nervous system's ability to change.

Question ID: Lil 2ce 3.3-23
Difficulty: 1
Page Ref: 97
Topic: Neural Plasticity: How and When the Brain Changes
Skill: Factual

24) Neurogenesis is the creation of new cells in the adult brain.

Question ID: Lil 2ce 3.3-24
Difficulty: 1
Page Ref: 99
Topic: Neural Plasticity: How and When the Brain Changes
Skill: Factual

Chapter 3: BIOLOGICAL PSYCHOLOGY
Multiple Choice Questions

1) The branch of life sciences which involves the structure and function of the brain and nervous system, while also focusing on the relationship between learning and behaviour, is called _____.
a. bioscience
b. neuroscience
c. brain scientology
d. neurostemology

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-1
Diff: 3
Page Ref: 90
Topic: Biological Psychology: Bridging the Levels of Analysis
Skill: Conceptual

2) The nervous system is defined as
a. a complex communication network of cells that carries information to and from all parts of the body.
b. a specialized cell that makes up the brain and nervous system.
c. all nerves and neurons that are not contained in the brain and spinal cord but that run throughout the body itself.
d. a gland located in the brain that secretes human growth hormone.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-2
Diff: 2
Page Ref: 90, 99-100
Topic: Biological Psychology: Bridging the Levels of Analysis & The Brain–Behaviour Network
Skill: Factual

3) A specialized cell that makes up the nervous system that receives and sends messages within that system is called a
a. node of Ranvier.
b. neuron.
c. glial cell.
d. reuptake cell.

Answer: b
Type: MC

Question ID: Lil 2ce 3.1-3
Diff: 1
Page Ref: 91
Topic: Neurons: The Brain's Communicators
Skill: Factual
Objective: 1.4

4) What term is used to describe a specialized cell that makes up the nervous system and receives and sends messages within that system?
a. Node of Ranvier
b. Neuron
c. Glial cell
d. Reuptake cell

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-4
Diff: 1
Page Ref: 91
Topic: Neurons: The Brain's Communicators
Skill: Factual

5) Which part of the neuron is responsible for maintaining the life of the cell?
a. Axon
b. Dendrite
c. Soma
d. Terminal button

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-5
Diff: 3
Page Ref: 91
Topic: Neurons: The Brain's Communicators
Skill: Factual

6) The part of a neuron that contains the nucleus and keeps the entire cell alive and functioning is the
a. axon.
b. dendrite.
c. soma.
d. terminal button.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-6

Diff: 2
Page Ref: 91
Topic: Neurons: The Brain's Communicators
Skill: Factual

7) The _____ is the central region of the neuron that manufactures new cell components.
a. cell body
b. axon
c. neuronal membrane
d. dendrite

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-7
Diff: 1
Page Ref: 91
Topic: Neurons: The Brain's Communicators
Skill: Factual

8) The brain communicates to other parts of the body via
a. nodes of Ranvier.
b. neurons.
c. glial cells.
d. reuptake.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-8
Diff: 1
Page Ref: 91
Topic: Neurons: The Brain's Communicators
Skill: Factual

9) The function of the _____ is to manufacture and renew neuronal cell components.
a. soma
b. synapse
c. nervous system
d. endorphins

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-9
Diff: 1
Page Ref: 91

Topic: Neurons: The Brain's Communicators
Skill: Factual

10) Which of the following statements reflects the relationship between the number of neurons in the human brain and the number of neural connections?
a. The number of neural connections is less than the number of neurons because some neurons operate in feedback loops.
b. Neurons connect in a one-to-one fashion with each other, so the number of neurons and neural connections is approximately equal.
c. Most neurons connect to about 5 other neurons, so the proportion of neural connections in about 5 times greater than the number of neurons.
d. The number of neural connections far outweighs the number of neurons, as many neurons have tens of thousands of connections.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-10
Diff: 2
Page Ref: 91
Topic: Neurons: The Brain's Communicators
Skill: Conceptual

11) The branchlike structures that receive messages from other neurons are called
a. axons.
b. dendrites.
c. nerve bundles.
d. mylons.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-11
Diff: 1
Page Ref: 91-92
Topic: Neurons: The Brain's Communicators
Skill: Factual

12) The brain communicates to other parts of the body via
a. neurons.
b. dendrites.
c. nerve bundles.
d. terminal button.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-12
Diff: 1

Page Ref: 91-92
Topic: Neurons: The Brain's Communicators
Skill: Factual

13) _____ receive messages from other neurons and _____send messages to other neurons.
a. Axons; dendrites
b. Axon; soma
c. Soma; glial cells
d. Dendrites; axons

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-13
Diff: 1
Page Ref: 91-92
Topic: Neurons: The Brain's Communicators
Skill: Factual

14) All neurons contain
a. cell body, myelin sheath, and axon.
b. dendrites, axon, and nodes of Ranvier.
c. dendrites, cell body, and axon.
d. dendrites, axon, and myelin sheath.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-14
Diff: 2
Page Ref: 91-92
Topic: Neurons: The Brain's Communicators
Skill: Factual

15) Your teacher asks you to describe the sequence of parts of a neuron that the impulse travels during neural conduction. Which of the following sequences will you offer?
a. dendrites, axon, soma, axon terminal
b. terminal buttons, axon, soma, dendrites
c. axon, soma, dendrites, axon terminal
d. dendrites, soma, axon, axon terminal

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-15
Diff: 2
Page Ref: 91-92
Topic: Neurons: The Brain's Communicators

Skill: Conceptual

16) The branches at the end of the axon are called
a. axon terminals.
b. synaptic vesicles.
c. synapses.
d. receptor sites.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-16
Diff: 1
Page Ref: 91-92
Topic: Neurons: The Brain's Communicators
Skill: Factual

17) What is the term used to describe the branches located at the end of the axon?
a. Axon terminals
b. Synaptic vesicles
c. Synapses
d. Receptor sites

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-17
Diff: 2
Page Ref: 91-92
Topic: Neurons: The Brain's Communicators
Skill: Factual

18) The fluid-filled space between the synaptic knob of one cell and the dendrites of the next cell is called the _____.
a. synapse
b. receptor site
c. axon terminal
d. synaptic knob

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-18
Diff: 2
Page Ref: 91-92
Topic: Neurons: The Brain's Communicators
Skill: Factual

19) What is the term used to describe the rounded areas on the ends of the axon terminals?
a. Synaptic vesicles
b. Axons
c. Dendrites
d. Synaptic knobs

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-19
Diff: 2
Page Ref: 91-92
Topic: Neurons: The Brain's Communicators
Skill: Factual

20) The spherical structures found inside the synaptic knob containing chemicals are called
a. axon terminals.
b. synapses.
c. synaptic vesicles.
d. receptor sites.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-20
Diff: 2
Page Ref: 91-92
Topic: Neurons: The Brain's Communicators
Skill: Factual

21) Which of the following are tiny sacs in a synaptic knob that release chemicals into the synapse?
a. synaptic vesicles
b. synaptic nodes
c. terminal buttons
d. synaptic gaps

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-21
Diff: 2
Page Ref: 91-92
Topic: Neurons: The Brain's Communicators
Skill: Factual

22) The function of the neuron’s axon is to

a. carry messages to other cells.
b. regulate the neuron's life processes.
c. receive messages from neighbouring neurons.
d. insulate against leakage of electrical impulses.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-22
Diff: 1
Page Ref: 92
Topic: Neurons: The Brain's Communicators
Skill: Factual

23) The _____ receive information from other neurons and have long extensions.
a. synaptic knobs
b. dendrites
c. axons
d. terminal buttons

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-23
Diff: 1
Page Ref: 92
Topic: Neurons: The Brain's Communicators
Skill: Factual

24) A _____ is a complex arrangement consisting of a gap between the specialized patches of membrane located on the sending and receiving neuron.
a. neuronal membrane
b. synaptic vesicle
c. terminal button
d. synapse

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-24
Diff: 1
Page Ref: 92
Topic: Neurons: The Brain's Communicators
Skill: Factual

25) Unlike _____, _____ are usually very thin at their site of origin near the cell body, because this narrowness creates a trigger zone, a site that's easy to activate.
a. cell bodies; dendrites
b. axons; axon terminals

c. axon terminals; synaptic knobs
d. dendrites; axons

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-25
Diff: 2
Page Ref: 92
Topic: Neurons: The Brain's Communicators
Skill: Factual

26) The _____ is a fatty coating that insulates the axons of some cells in the nervous system.
a. glial cell
b. myelin sheath
c. Nodes of Ranvier
d. dendritic spine

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-26
Diff: 1
Page Ref: 91-93
Topic: Neurons: The Brain's Communicators
Skill: Factual

27) Gaps in the myelin sheath are called _____, which helps in the conduction of neural impulses.
a. nodes
b. synaptic clefts
c. axonal clefts
d. synapses

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-27
Diff: 1
Page Ref: 91-93
Topic: Neurons: The Brain's Communicators
Skill: Factual

28) Which of the following are responsible for speeding up the transmission of neural impulses?
a. Synapse and axon terminal
b. Myelin sheath and nodes
c. Axon and action potentials

d. Dendrites and cell body

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-28
Diff: 2
Page Ref: 91-93
Topic: Neurons: The Brain's Communicators
Skill: Conceptual

29) A chemical found in the synaptic vesicles which, when released, has an effect on the next cell is called a
a. neurotransmitter.
b. glial cell.
c. precursor cell.
d. synapse.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-29
Diff: 2
Page Ref: 92
Topic: Neurons: The Brain's Communicators
Skill: Factual

30) Neurotransmitters are found in the
a. synaptic vesicles.
b. cell body.
c. dendritic spines.
d. mitochondria.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-30
Diff: 1
Page Ref: 92
Topic: Neurons: The Brain's Communicators
Skill: Factual

31) The term neurotransmitter refers to
a. a chemical found in the synaptic vesicles that is released into the synapse.
b. any one of a number of chemical compounds that increase the activity of the endocrine system.
c. the chemical substance found in the cell membrane.
d. the DNA contained in the nucleus of every neuron.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-31
Diff: 2
Page Ref: 92
Topic: Neurons: The Brain's Communicators
Skill: Factual

32) According to your text, _____ work in a manner similar to how gel capsules filled with cold medicine work.
a. synapses
b. synaptic vesicles
c. axon terminals
d. neurotransmitters

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-32
Diff: 2
Page Ref: 92
Topic: Neurons: The Brain's Communicators
Skill: Conceptual

33) Neurotransmitters are released from the _____ and received or detected by the _____.
a. dendrites; axon terminals
b. presynaptic membrane; postsynaptic membrane
c. cell body; dendrites
d. postsynaptic membrane; presynaptic membrane

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-33
Diff: 3
Page Ref: 91-93
Topic: Neurons: The Brain's Communicators
Skill: Conceptual

34) Glial cells
a. form the blood-brain barrier.
b. promote neuronal healing.
c. protect neurons.
d. All of the above

Answer: d
Type: MC

Question ID: Lil 2ce 3.1-34
Diff: 2
Page Ref: 92-93
Topic: Neurons: The Brain's Communicators
Skill: Factual

35) Which of the following was/were once thought to be about ten times more numerous than neurons?
a. Glial cells
b. Myelin sheath
c. Nodes of Ranvier
d. Axons

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-35
Diff: 2
Page Ref: 92-93
Topic: Neurons: The Brain's Communicators
Skill: Factual

36) The blood-brain barrier, which keeps harmful molecules from entering the brain, is composed of _____ that form a fatty coating around tiny blood vessels.
a. myelin sheath
b. glial cells
c. the Nodes of Ranvier
d. neurotransmitters

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-36
Diff: 2
Page Ref: 92-93
Topic: Neurons: The Brain's Communicators
Skill: Factual

37) A cell in the human nervous system whose primary function is to provide insulation and structure for neurons on which they may develop and work is called a(n)
a. epidermal cell.
b. glial cell.
c. myelin cell.
d. adipose cell.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-37

Diff: 2
Page Ref: 92-93
Topic: Neurons: The Brain's Communicators
Skill: Factual

38) What is the function of the myelin sheath?
a. to serve as a structure for neurons
b. to monitor neural activity
c. to speed up the neural impulse
d. to produce neurotransmitters

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-38
Diff: 2
Page Ref: 92-93
Topic: Neurons: The Brain's Communicators
Skill: Factual

39) One purpose of the _____ is to speed up the neural message travelling down the axon.
a. receptor site
b. axon terminal
c. myelin sheath
d. synaptic vesicle

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-39
Diff: 2
Page Ref: 92-93
Topic: Neurons: The Brain's Communicators
Skill: Factual

40) A fatty substance that is wrapped around the shaft of axons in the nervous system and whose function is to insulate neurons and speed up the neural impulse is called a
a. synaptic vesicle.
b. dendrite.
c. glial cell.
d. myelin sheath.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-40
Diff: 2
Page Ref: 92-93

Topic: Neurons: The Brain's Communicators
Skill: Factual

41) Kristine suffers from _____, which is associated with the myelin sheaths surrounding neurons being "eaten away" and neural messages not fully travelling down axons.
a. multiple sclerosis
b. cystic fibrosis
c. Parkinson's disease
d. Alzheimer's disease

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-41
Diff: 3
Page Ref: 93
Topic: Neurons: The Brain's Communicators
Skill: Applied

42) The _____ speeds up the passage of electrical messages by acting as an insulator of the neuronal signal.
a. terminal button
b. myelin sheath
c. blood-brain barrier
d. All of the answers are correct.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-42
Diff: 2
Page Ref: 93
Topic: Neurons: The Brain's Communicators
Skill: Factual

43) The action potential causes neurotransmitters to be released into the
a. myelin sheath.
b. axon.
c. synapse.
d. synaptic vesicle.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-43
Diff: 2
Page Ref: 93-94
Topic: Electrifying Thought

Skill: Factual

44) Scientists have been able to record the electrical activity of neurons using
a. tiny electrodes.
b. single cell stimulation.
c. event related potentials (ERPs).
d. functional magnetic resonance imaging (fMRIs).

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-44
Diff: 2
Page Ref: 93
Topic: Electrifying Thought
Skill: Factual

45) During an action potential, what changes are evident in the negative ions inside the neuron?
a. Negative ions rush out of the axon to increase the positive charge inside the axon.
b. Negative and positive ions flow into the axon to maintain a balanced proportion.
c. There is little or no net change in the distribution of negative ions.
d. Negative ions trigger the release of neurotransmitters in the axon terminals.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-45
Diff: 3
Page Ref: 93-94
Topic: Electrifying Thought
Skill: Conceptual

46) What is the threshold level needed to trigger an action potential in many neurons?
a. -70 mV
b. -55 mV
c. 0 mV
d. +40 mV

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-46
Diff: 3
Page Ref: 93-94
Topic: Electrifying Thought
Skill: Factual

47) During the refractory period, the electrical charge inside the cell is _____ the electrical charge when the cell is in a resting state.
a. more positive than
b. larger than
c. more negative than
d. smaller than

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-47
Diff: 3
Page Ref: 94
Topic: Electrifying Thought
Skill: Factual

48) The voltage of -60 mv is known as the neuron's
a. postsynaptic potential.
b. graded potential.
c. action potential.
d. resting potential.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-48
Diff: 3
Page Ref: 93
Topic: Electrifying Thought
Skill: Factual

49) When a cell is "at rest," it is in a state called the
a. stopping point.
b. obcipitation junction.
c. resting potential.
d. action potential.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-49
Diff: 1
Page Ref: 93
Topic: Electrifying Thought
Skill: Factual

50) When the electric potential in a cell is in action versus a resting state, this electrical charge reversal is known as the
a. resting potential.

b. excitation reaction.
c. action potential.
d. permeable reaction.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-50
Diff: 2
Page Ref: 93-94
Topic: Electrifying Thought
Skill: Factual

51) What do we call the state of a neuron when it is not firing a neural impulse?
a. Action potential
b. Resting potential
c. Myelination signal
d. Transmission impulse

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-51
Diff: 2
Page Ref: 93
Topic: Electrifying Thought
Skill: Factual

52) The state during which a neuron contains more negatively charged ions inside the cell than outside the cell and is not firing is referred to as the
a. action potential.
b. quiet potential.
c. synaptic potential.
d. resting potential.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-52
Diff: 2
Page Ref: 93
Topic: Electrifying Thought
Skill: Factual

53) During action potential, the electrical charge inside the neuron is _____ the electrical charge outside the neuron.
a. more positive than
b. larger than
c. more negative than

d. smaller than

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-53
Diff: 2
Page Ref: 93-94
Topic: Electrifying Thought
Skill: Factual

54) When a neuron fires, it fires in a(n) _____ fashion as there is no such thing as "partial" firing.
a. all-or-none
b. rapid fire
c. accidental patterned
d. quick succession

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-54
Diff: 1
Page Ref: 93
Topic: Electrifying Thought
Skill: Factual

55) "All or none" is the principle stating that
a. a neuron either fires or does not fire.
b. a neuron fires at full strength or not at all.
c. all the dendrites must be receiving messages telling the neuron to fire or it will not fire at all.
d. all somas must be receiving messages telling the neuron to fire or it will not fire at all.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-55
Diff: 1
Page Ref: 93
Topic: Electrifying Thought
Skill: Factual

56) Which of the following statements about action potentials is not true?
a. Action potentials operate on an all-or-none principle whether a cell either "fires" or it does not.
b. Action potentials are regenerative and once started, they continue the length of the axon.

c. Action potentials operate differently than graded potentials.
d. Action potentials are bidirectional and can flow either up or down an axon.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-56
Diff: 3
Page Ref: 93-94
Topic: Electrifying Thought
Skill: Conceptual

57) Which of the following statements is not true?
a. Action potentials are always the same strength.
b. Action potentials will jump from node to node on myelinated axons.
c. Action potentials are graded in size.
d. Action potentials travel down the axon.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-57
Diff: 3
Page Ref: 93-94
Topic: Electrifying Thought
Skill: Conceptual

58) Owantu let out an ear-piercing scream when he became frightened. He was unable to stimulate those neurons for a brief time after their firing because of the
a. potential gradation.
b. absolute refractory period.
c. relative refractory period.
d. regenerative timeout.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-58
Diff: 2
Page Ref: 94
Topic: Electrifying Thought
Skill: Applied

59) Which of the following statements is not true?
a. Graded potentials can be inhibitory.
b. Graded potentials can be excitatory.
c. Graded potentials always become action potentials.
d. Graded potentials are postsynaptic potentials.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-59
Diff: 2
Page Ref: 94
Topic: Electrifying Thought
Skill: Factual

60) The maximal firing rate, or the fastest rate at which a neuron can fire, is limited by the
a. number of glial cells surrounding the axon.
b. absolute refractory period.
c. number of graded potential inputs received by the cell.
d. postsynaptic potential of the neuron.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-60
Diff: 2
Page Ref: 94
Topic: Electrifying Thought
Skill: Factual

61) Intracellular communication relies on _____ transmission whereas intercellular communication relies on _____ transmission.
a. neurotransmitter; chemical
b. chemical; electrical
c. electrical; chemical
d. positive ion; negative ion

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-61
Diff: 2
Page Ref: 95
Topic: Chemical Communication: Neurotransmission
Skill: Factual

62) The location that uniquely recognizes a neurotransmitter is called a(n)
a. action potential.
b. reuptake.
c. threshold.
d. receptor site.

Answer: d
Type: MC

Question ID: Lil 2ce 3.1-62
Diff: 2
Page Ref: 95
Topic: Chemical Communication: Neurotransmission
Skill: Factual

63) _____ are holes in the surface of the dendrites or certain cells of the muscles and glands that are shaped to fit only certain neurotransmitters.
a. Neurotransmitters
b. Axons
c. Synaptic vesicles
d. Receptor sites

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-63
Diff: 2
Page Ref: 95
Topic: Chemical Communication: Neurotransmission
Skill: Factual

64) Which structure is like a locked door that only certain neurotransmitter keys can unlock?
a. Synapses
b. Receptor sites
c. Neural chiasms
d. Response terminals

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-64
Diff: 2
Page Ref: 95
Topic: Chemical Communication: Neurotransmission
Skill: Factual

65) What neurotransmitter is responsible for motor function and reward?
a. Glutamate
b. Dopamine
c. Anandamide
d. Serotonin

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-65
Diff: 3

Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Factual

66) What neurotransmitter is responsible for pain reduction and increased appetite?
a. Endorphin
b. Anandamide
c. Dopamine
d. Serotonin

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-66
Diff: 3
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Factual

67) _____neurotransmitters make it more likely that a neuron will send its message to other neurons, whereas _____ neurotransmitters make it less likely that a neuron will send its message.
a. Excitatory; inhibitory
b. Inhibitory; excitatory
c. Augmentation; depletion
d. Depletion; augmentation

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-67
Diff: 3
Page Ref: 95
Topic: Chemical Communication: Neurotransmission
Skill: Conceptual

68) Which of the following is not true about neurotransmitters?
a. Neurotransmitters bind to receptor sites that are specific to that type of neurotransmitter.
b. Neurotransmitters may be broken down chemically to halt neurotransmission.
c. Neurotransmission may be halted by reuptake of the neurotransmitter back into the axon terminal.
d. Neurotransmitters can bind to any receptor site.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-68
Diff: 2

Page Ref: 95
Topic: Chemical Communication: Neurotransmission
Skill: Factual

69) Isabella is putting mustard on her hot dog. She realises she has put too much and sucks up some of it back into the squeeze bottle. This process is similar to
a. the action potential.
b. binding specificity.
c. reuptake.
d. receptor site bindings.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-69
Diff: 2
Page Ref: 95
Topic: Chemical Communication: Neurotransmission
Skill: Applied

70) The main excitatory neurotransmitter in the nervous system that plays a role in the relay of sensory information and learning is
a. gamma-aminobutyric acid (GABA).
b. acetylcholine.
c. serotonin.
d. glutamate.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-70
Diff: 3
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Factual

71) The main inhibitory neurotransmitter in the nervous system is
a. serotonin.
b. gamma-aminobutyric acid (GABA).
c. glutamate.
d. acetylcholine.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-71
Diff: 3
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission

Skill: Factual

72) Neurons in virtually every brain area use these neurotransmitters to communicate with other neurons. They are
a. glutamate and serotonin.
b. gamma-aminobutyric acid (GABA) and acetylcholine.
c. glutamate and gamma-aminobutyric acid (GABA).
d. dopamine and serotonin.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-72
Diff: 3
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Factual

73) Mobombi had completed about a quarter of the distance in the marathon in which he was a participant. Suddenly, he stumbled and fell. Despite feeling a sharp pain initially, he got up and continued to run until he completed the race. Upon crossing the finish line he fell down writhing in pain. When checked out, it was discovered that Mobombi had broken his leg. He was able to run the remainder of the marathon relatively pain free due to the release of
a. neuropeptides.
b. amino acids.
c. endorphins.
d. monoamines.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-73
Diff: 3
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Applied

74) Which of the following is not one of the three main steps in neurotransmission?
a. Reuptake
b. Synthesis
c. Release
d. Binding

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-74
Diff: 3

Page Ref: 95
Topic: Chemical Communication: Neurotransmission
Skill: Conceptual

75) Alcohol and anti-anxiety drugs tend to increase the activity of which neurotransmitter?
a. Acetylcholine
b. Dopamine
c. Serotonin
d. GABA

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-75
Diff: 3
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Conceptual

76) Michael has been diagnosed with Parkinson's disease, and is being treated with drugs that help to increase his levels of the neurotransmitter
a. serotonin.
b. dopamine.
c. acetylcholine.
d. GABA

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-76
Diff: 3
Page Ref: 95
Topic: Chemical Communication: Neurotransmission
Skill: Applied

77) Carson is addicted to methamphetamine, whereas Jonas is addicted to heroin. According to your text, the neurotransmitter associated with Carson's addiction is _____ and Jonas's addiction is _____.
a. norepinephrine; endorphins
b. anandamide; norepinephrine
c. endorphins; GABA
d. glutamate; anandamide

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-77
Diff: 3

Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Applied

78) Which of the following examples accurately matches a neurotransmitter to behaviour?
a. Lucy has schizophrenia and takes antipsychotic drugs that block dopamine.
b. Randy takes a serotonin-selective reuptake inhibitor (SSRI) drug to treat his depression.
c. Sean is taking a pill that says it is going to enhance memory by increasing GABA activity.
d. Greta takes both morphine and codeine to help relieve the pain she has from a car accident.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-78
Diff: 3
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Applied

79) Glutamate is to _____ as anandamide is to _____.
a. memory enhancer; methamphetamine
b. nicotine; narcotic drugs
c. antianxiety drugs; SSRIs
d. alcohol; marijuana

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-79
Diff: 3
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Conceptual

80) _____ plays a critical role as a neurotransmitter that stimulates muscles to contract.
a. Acetylcholine
b. GABA
c. Dopamine
d. Endorphin

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-80
Diff: 2

Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Factual

81) Sara has been experiencing a serious memory problem. An interdisciplinary team has ruled out a range of causes and believes that a neurotransmitter is involved. Which neurotransmitter is most likely involved in this problem?
a. Anandamide
b. Dopamine
c. Serotonin
d. Acetylcholine

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-81
Diff: 3
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Applied

82) Which of the following neurotransmitters functions as a common inhibitory neurotransmitter in the brain?
a. Serotonin
b. GABA
c. Acetylcholine
d. Norepinephrine

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-82
Diff: 2
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Factual

83) Which neurotransmitter is associated with sleep, mood, and temperature regulation?
a. GABA
b. Serotonin
c. Dopamine
d. Acetylcholine

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-83
Diff: 3
Page Ref: 95-96

Topic: Chemical Communication: Neurotransmission
Skill: Factual

84) Andy has decided to seek medical help for mood disturbances and sleeping problems. Which neurotransmitter is most likely involved in the problems Andy is experiencing?
a. GABA
b. Serotonin
c. Dopamine
d. Acetylcholine

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-84
Diff: 3
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Applied

85) Endorphins are
a. found where neurons meet skeletal muscles.
b. less powerful than enkaphalins.
c. pain-reducing chemicals.
d. radically different in function from neurotransmitters.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-85
Diff: 2
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Factual

86) Pain-controlling chemicals in the body are called
a. neural regulators.
b. histamines.
c. androgens.
d. endorphins.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-86
Diff: 2
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Factual

87) Because they have similar chemical structures, morphine and other opiates are able to lock into receptor sites for
a. GABA.
b. endorphins.
c. dopamine.
d. acetylcholine.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-87
Diff: 2
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Factual

88) Reuptake is
a. a chemical that is released into the synaptic gap.
b. a protein molecule on the dendrite or cell body of a neuron that will interact only with specific neurotransmitters.
c. a process by which neurotransmitters are reabsorbed back into the synaptic vesicles.
d. a chemical that plays a role in learning and attention.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-88
Diff: 1
Page Ref: 95
Topic: Chemical Communication: Neurotransmission
Skill: Factual

89) The brain's production of endorphins (meaning 'morphine from within') helps to block pain molecules much like morphine and
a. acetylcholine.
b. opiates.
c. barbiturates.
d. stimulants.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-89
Diff: 3
Page Ref: 95-97
Topic: Chemical Communication: Neurotransmission
Skill: Factual

90) The neurotransmitter _____ is responsible for pain reduction and increased appetite.
a. dopamine
b. anandamide
c. serotonin
d. acetylcholine

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-90
Diff: 2
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Factual

91) Monica has recently quit smoking, and is finding that she is now having trouble paying attention and remembering things. Decreases in what neurotransmitter explain Monica's behaviour?
a. Dopamine
b. Serotonin
c. Acetylcholine
d. Glutamate

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-91
Diff: 3
Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Applied

92) Carlos is a runner. If he had Botox injected into his leg muscles, which of the following outcomes would occur?
a. He would be unable to move his leg muscles because Botox blocks the functioning of Ach on muscles.
b. He would experience an enhanced ability to combat the physical strain of long distance running.
c. He would have an overall reduction in function as Botox inhibits neural transmission.
d. He may become more aggressive and moody as this would increase his levels of serotonin.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-92
Diff: 3

Page Ref: 95-96
Topic: Chemical Communication: Neurotransmission
Skill: Applied

93) Susan was the victim of an assault in the park, and has experienced high levels of anxiety in the aftermath of her attack. She is taking Xanax (a tranquiliser) to help with her anxiety, which stimulates GABA receptor sites and decreases neuronal activities. What type of drug is Xanax?
a. Antagonist
b. Depressant
c. Stimulant
d. Agonist

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-93
Diff: 3
Page Ref: 97
Topic: Chemical Communication: Neurotransmission
Skill: Applied

94) Drugs that decrease a neuron's activity are called
a. antagonists.
b. reuptake blockers.
c. agonists.
d. excitatory.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-94
Diff: 3
Page Ref: 97
Topic: Chemical Communication: Neurotransmission
Skill: Factual

95) _____ is a psychoactive drug that causes paralysis by blocking acetylcholine's actions on muscles.
a. Botulinum
b. Arsenic
c. Alprazolam
d. Tetanus

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-95
Diff: 2

Page Ref: 97
Topic: Chemical Communication: Neurotransmission
Skill: Factual

96) If a person were to damage the speech centre in the brain, the ideal age for this to happen would be
a. 14.
b. 2.
c. 33.
d. 61.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-96
Diff: 3
Page Ref: 97-99
Topic: Neural Plasticity: How and When the Brain Changes
Skill: Conceptual

97) Which of the following processes is not involved in fine-tuning connections in the brain during the initial stages of neural development?
a. Synaptogenesis
b. Pruning
c. Neurogenesis
d. Myelination

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-97
Diff: 1
Page Ref: 97
Topic: Neural Plasticity: How and When the Brain Changes
Skill: Factual

98) The process of _____ is considered essential for learning and structural changes in the brain.
a. long-term potentiation
b. synaptogenesis
c. pruning
d. neurotrophy

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-98
Diff: 3
Page Ref: 98

Topic: Neural Plasticity: How and When the Brain Changes
Skill: Factual

99) One theory of infantile autism suggests that _____ may be the cause of the disorder.
a. inadequate myelination
b. inadequate pruning
c. inadequate synaptogenesis
d. inadequate dendrite and axon growth

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-99
Diff: 3
Page Ref: 97-98
Topic: Neural Plasticity: How and When the Brain Changes
Skill: Factual

100) Long-term potentiation refers to
a. neural plasticity.
b. structural changes in the neuron.
c. maturational development.
d. synapses that show stronger and prolonged excitatory responses.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-100
Diff: 3
Page Ref: 97-98
Topic: Neural Plasticity: How and When the Brain Changes
Skill: Factual

101) Stem cell research provides the following ways of treating neurodegenerative diseases except
a. implanting stem cells into the host's nervous system and inducing them to grow and replace damaged cells.
b. acquiring a better understanding of how neurons age through research on stem cells.
c. genetically engineering stem cells so that the cells can administer gene therapy .
d. None of the above

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-101
Diff: 3
Page Ref: 98-99
Topic: Neural Plasticity: How and When the Brain Changes

Skill: Conceptual

102) _____ is the creation of new cells in the adult brain.
a. Neurogenesis
b. Neural plasticity
c. Synaptogenesis
d. Long term potentiation

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-102
Diff: 2
Page Ref: 99
Topic: Neural Plasticity: How and When the Brain Changes
Skill: Factual

103) An individual who has multiple sclerosis experiences demyelination of the neurons in their central nervous system. If these neurons could be remyelinated, this would demonstrate the concept of
a. long-term potentiation.
b. neural plasticity.
c. synaptogenesis.
d. neurogenesis.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-103
Diff: 2
Page Ref: 97-99
Topic: Neural Plasticity: How and When the Brain Changes
Skill: Conceptual

104) What percentage of the brains' neurons die off during pruning?
a. 15 percent
b. 35 percent
c. 50 percent
d. 70 percent

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-104
Diff: 2
Page Ref: 98
Topic: Neural Plasticity: How and When the Brain Changes
Skill: Factual

105) Research has demonstrated that _____ are associated with more elaborate dendrites with more branches.
a. stem cells
b. gene replacements
c. enriched environments
d. spinal regeneration

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-105
Diff: 2
Page Ref: 98
Topic: Neural Plasticity: How and When the Brain Changes
Skill: Factual

106) The two main divisions of the nervous system are the _____ and _____.
a. brain; spinal cord
b. autonomic; somatic nervous systems
c. peripheral nervous system; central nervous system
d. glands; muscles

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-106
Diff: 2
Page Ref: 99-100
Topic: The Brain–Behaviour Network
Skill: Factual

107) The brain and spinal cord are two components of the
a. central nervous system.
b. somatic nervous system.
c. peripheral nervous system.
d. autonomic nervous system.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-107
Diff: 2
Page Ref: 99-100
Topic: The Brain–Behaviour Network
Skill: Factual

108) The central nervous system consists of
a. the parasympathetic and sympathetic divisions.
b. the brain and spinal cord.

c. muscles and glands.
d. sense organs and sensory neurons.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-108
Diff: 2
Page Ref: 99-100
Topic: The Brain–Behaviour Network
Skill: Factual

109) The peripheral nervous system consists of
a. all the nerve cells that are not in the brain and spinal cord.
b. all nerves in the brain and the spinal cord.
c. the spinal cord and autonomic system.
d. the brain and the autonomic system.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-109
Diff: 2
Page Ref: 99-100
Topic: The Brain–Behaviour Network
Skill: Factual

110) The brain and spinal cord make up the
a. somatic nervous system.
b. autonomic nervous system.
c. peripheral nervous system.
d. central nervous system.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-110
Diff: 1
Page Ref: 99-100
Topic: The Brain–Behaviour Network
Skill: Factual

111) Phineas Gage tragically had a tamping iron propelled through his head. Both left and right sides of the prefrontal cortex were severely damaged. As a result of the accident, Phineas Gage
a. died from his injuries.
b. lost his sense of hearing.
c. suffered loss of his arms and legs.
d. suffered a change in personality.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-111
Diff: 1
Page Ref: 103
Topic: The Central Nervous System: The Command Centre
Skill: Factual

112) Ito was driving through a rough part of town late at night when a stray bullet hit the front side of his head. Both the left and right sides of his prefrontal cortex were severely damaged. As a result of the accident, Ito most likely
a. suffered loss of his arms and legs.
b. suffered a change in personality.
c. lost his sense of hearing.
d. died from his injuries.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-112
Diff: 2
Page Ref: 102-103
Topic: The Central Nervous System: The Command Centre
Skill: Applied

113) Which part of the nervous system takes the information received from the senses, makes sense out of it, makes decisions, and sends commands out to the muscles and the rest of the body?
a. Spinal cord
b. Reflexes
c. Brain
d. Interneurons

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-113
Diff: 3
Page Ref: 100-104
Topic: The Central Nervous System: The Command Centre
Skill: Conceptual

114) The long bundle of neurons that carries messages to and from the body to the brain and is responsible for very fast, lifesaving reflexes is called the
a. spinal cord.
b. reflexes.
c. brain.

d. interneurons.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-114
Diff: 2
Page Ref: 107-108
Topic: The Central Nervous System: The Command Centre
Skill: Factual

115) Which of the following is a long bundle of neurons that functions as a carrier of messages from the body to the brain and from the brain to the body and is responsible for certain reflexes?
a. Spinal cord
b. Reflexes
c. Brain
d. Amygdala

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-115
Diff: 2
Page Ref: 107-108
Topic: The Central Nervous System: The Command Centre
Skill: Factual

116) Trevor has difficulty controlling some of his movements and often stumbles or falls because he loses his balance. What area of Trevor's brain is not functioning correctly?
a. Hypothalamus
b. Cerebellum
c. Brain stem
d. Thalamus

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-116
Diff: 3
Page Ref: 100-101, 107
Topic: The Central Nervous System: The Command Centre
Skill: Applied

117) Brian was in a severe car accident and has suffered brain damage as a result. He is in a coma and has to be hooked up to a ventilator and heart monitor constantly. Brian suffered damage to what area of the brain?
a. Forebrain

b. Corpus callosum
c. Brain stem
d. Cerebellum

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-117
Diff: 2
Page Ref: 106-107
Topic: The Central Nervous System: The Command Centre
Skill: Applied

118) Brenda boasts that she is very intellectual and is a straight A student. What part of her brain is necessary for her advanced intellectual abilities?
a. Cerebellum
b. Corpus callosum
c. Hypothalamus
d. Cerebrum

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-118
Diff: 2
Page Ref: 101-102
Topic: The Central Nervous System: The Command Centre
Skill: Applied

119) Which of the following brain structures connects to both the forebrain and cerebral cortex and plays a key role in arousal?
a. Substantia nigra
b. Motor neurons
c. Medulla
d. Reticular activating system

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-119
Diff: 3
Page Ref: 106-107
Topic: The Central Nervous System: The Command Centre
Skill: Factual

120) Jill was in a rock climbing accident where she fell and hit the top-back portion of her head. After her accident, she found she had difficulty navigating her apartment and would frequently run into tables, chairs, and walls. She also had trouble paying

attention to others and interpreting their actions. What part of the brain is associated with these changes in Jill's behaviour?
a. Temporal lobe
b. Occipital lobe
c. Parietal lobe
d. Frontal lobe

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-120
Diff: 2
Page Ref: 103-104
Topic: The Central Nervous System: The Command Centre
Skill: Applied

121) Which of the following examples correctly describes what would happen if someone suffered damage to Wernicke's area?
a. Veronica has difficulty producing speech and is unable to come up with the words she is trying to say.
b. Jody cannot retain any new memories, and will forget what was just said to her if her attention shifts.
c. James no longer pays attention to the left half of his body, and only shaves half of his face.
d. When Will speaks, it makes no sense and resembles a sort of "word salad" even though his pace of speech is normal.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-121
Diff: 3
Page Ref: 104
Topic: The Central Nervous System: The Command Centre
Skill: Conceptual

122) The visual cortex, and most of our visual processes, is in what lobe of the brain?
a. Temporal lobe
b. Occipital lobe
c. Frontal lobe
d. Parietal lobe

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-122
Diff: 2
Page Ref: 104
Topic: The Central Nervous System: The Command Centre

Skill: Factual

123) The motor cortex is a part of the _____ lobe whereas the somatosensory cortex is part of the _____ lobe.
a. parietal; frontal
b. frontal; parietal
c. temporal; occipital
d. occipital; parietal

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-123
Diff: 2
Page Ref: 102-104
Topic: The Central Nervous System: The Command Centre
Skill: Factual

124) The auditory association cortex is in what part of the brain?
a. Parietal lobe
b. Frontal lobe
c. Temporal lobe
d. Occipital lobe

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-124
Diff: 3
Page Ref: 103-104
Topic: The Central Nervous System: The Command Centre
Skill: Factual

125) Joey and his friends decided to go to New York for the weekend and go to one of the most famous delis in the city. Joey loves deli sandwiches and he is really looking forward to his trip. What part of Joey's brain is responsible for helping him make the movements he needs to obtain his sandwich?
a. Substantia nigra
b. Basal ganglia
c. Basal forebrain
d. Thalamus

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-125
Diff: 2
Page Ref: 104-105
Topic: The Central Nervous System: The Command Centre

Skill: Applied

126) Broca's area is responsible for _____ speech whereas Wernicke's area is responsible for _____ speech.
a. interpreting; producing
b. producing; understanding
c. hearing; verbalizing
d. interpreting written; interpreting verbal

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-126
Diff: 2
Page Ref: 102-104
Topic: The Central Nervous System: The Command Centre
Skill: Factual

127) The pathways emanating from the RAS activate the cortex by increasing the
a. long-term potentiation.
b. cortical membrane.
c. signal-to-noise ratio.
d. cerebral ventricles.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-127
Diff: 3
Page Ref: 106-107
Topic: The Central Nervous System: The Command Centre
Skill: Factual

128) When you have your annual physical, the doctor taps your knee with a tiny hammer and you involuntarily jerk your leg. This is an example of a
a. parasympathetic reflex.
b. myelinated reflex.
c. cerebral spinofluid reflex.
d. spinal reflex.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-128
Diff: 2
Page Ref: 107-108
Topic: The Central Nervous System: The Command Centre
Skill: Conceptual

129) Neurons that send messages to other neurons are called
a. interneurons.
b. motor neurons.
c. efferent neurons.
d. sensory neurons.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-129
Diff: 2
Page Ref: 107-108
Topic: The Central Nervous System: The Command Centre
Skill: Factual

130) The part of the brain dedicated to emotion is
a. the lymphatic system.
b. the reticular activating system.
c. the limbic system.
d. the endocrine system.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-130
Diff: 1
Page Ref: 105-106
Topic: The Central Nervous System: The Command Centre
Skill: Factual

131) The _____ regulates and maintains constant internal bodily states and plays a variety of roles in emotion and motivation.
a. amygdala
b. thalamus
c. hypothalamus
d. hippocampus

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-131
Diff: 2
Page Ref: 106
Topic: The Central Nervous System: The Command Centre
Skill: Factual

132) As Joe walks to his car late at night, he hears footsteps behind him. Feeling afraid, Joe grips his keys and quickens his pace. It is likely that Joe's _____ has been activated.

a. hypothalamus
b. amygdala
c. hippocampus
d. cerebellum

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-132
Diff: 2
Page Ref: 106
Topic: The Central Nervous System: The Command Centre
Skill: Applied

133) Kristine is terrified of robots and experiences an intense fear response when she is exposed to any stimuli that involve robots. Which of the following parts of her brain is most highly activated when she sees a robot?
a. Hypothalamus
b. Hippocampus
c. Amygdala
d. Thalamus

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-133
Diff: 2
Page Ref: 106
Topic: The Central Nervous System: The Command Centre
Skill: Applied

134) Marlen suffered damage to his hippocampus, and as a result, has problems
a. expressing emotion and does not develop fear conditioned responses.
b. remembering previous experiences, but his ability to form new memories is intact.
c. controlling his voluntary movements and responding to emotional stimuli.
d. forming new memories, but his old memories remain intact.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-134
Diff: 2
Page Ref: 106
Topic: The Central Nervous System: The Command Centre
Skill: Applied

135) According to _____ theory, memories are initially stored at multiple sites. Over time, storage strengthens at some sites, but weakens at others.

a. memory consolidation
b. neural realignment
c. multiple trace
d. memory transfer

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-135
Diff: 3
Page Ref: 106
Topic: The Central Nervous System: The Command Centre
Skill: Factual

136) In the peripheral nervous system, _____ carry messages from special sense receptors in the skin, muscles, and other internal and external sense organs to the spinal cord.
a. sensory neurons
b. autonomic nerves
c. motor neurons
d. autonomic neurons

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-136
Diff: 3
Page Ref: 107-108
Topic: The Central Nervous System: The Command Centre & The Peripheral Nervous System
Skill: Conceptual

137) Vladimir is typing on the computer keyboard. The motion of his fingers on the keys is probably being controlled by
a. the autonomic nervous system.
b. sensory neurons.
c. motor neurons.
d. autonomic neurons.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-137
Diff: 3
Page Ref: 107-108
Topic: The Central Nervous System: The Command Centre & The Peripheral Nervous System
Skill: Conceptual

138) The division of the nervous system that allows the brain and the spinal cord to communicate with the sensory systems of the eyes, ears, skin, and mouth, and allows the brain and spinal cord to control the muscles and glands of the body is called the
a. peripheral nervous system.
b. central nervous system.
c. endocrine system.
d. secondary nervous system.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-138
Diff: 2
Page Ref: 99-100, 108-109
Topic: The Brain–Behaviour Network & The Peripheral Nervous System
Skill: Factual

139) The peripheral nervous system consists of the _____ and the _____ nervous systems.
a. autonomic; somatic
b. autonomic; sympathetic
c. parasympathetic; somatic
d. parasympathetic; sympathetic

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-139
Diff: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

140) Voluntary muscles are controlled by the _____nervous system.
a. somatic
b. autonomic
c. sympathetic
d. parasympathetic

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-140
Diff: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

141) The subdivision of the peripheral nervous system that is made up of all nerves carrying messages from the senses to the central nervous system and all nerves carrying messages from the central nervous system to skeletal muscles is called the _____.
a. autonomic nervous system
b. parasympathetic nervous system
c. somatic nervous system
d. central nervous system

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-141
Diff: 3
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

142) Every deliberate action you make, such as pedalling a bike, walking, scratching, or smelling a flower, involves neurons in the _____ nervous system.
a. somatic
b. sympathetic
c. parasympathetic
d. autonomic

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-142
Diff: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Conceptual

143) As she walks out of the living room, Gloriann turns out the light. In this example, Gloriann's _____ is active.
a. sympathetic nervous system
b. parasympathetic nervous system
c. autonomic nervous system
d. somatic nervous system

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-143
Diff: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Applied

144) The involuntary actions of our organs and glands are controlled by the _____ nervous system.
a. somatic
b. autonomic
c. sympathetic
d. parasympathetic

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-144
Diff: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

145) The subdivision of the peripheral nervous system that consists of nerves that control all of the involuntary muscles, organs, and glands is called the _____ nervous system.
a. somatic
b. autonomic
c. sympathetic
d. parasympathetic

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-145
Diff: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

146) When you see someone you have a crush on and your heart pounds, your hands get sweaty, and your cheeks feel hot, your _____ is/are active.
a. skeletal nervous system
b. spinal reflexes
c. autonomic nervous system
d. somatic nervous system

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-146
Diff: 3
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Conceptual

147) The autonomic nervous system has two divisions called the _____ and the _____.
a. central; peripheral
b. sympathetic; parasympathetic
c. receptors; effectors
d. limbic; endocrine

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-147
Diff: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

148) Which component of the nervous system mobilizes the body in times of crisis?
a. central
b. somatic
c. sympathetic
d. parasympathetic

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-148
Diff: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

149) The part of the autonomic nervous system that is responsible for reacting to stressful events and bodily arousal is called the _____ nervous system.
a. central
b. somatic
c. sympathetic
d. parasympathetic

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-149
Diff: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

150) As Molly is walking across campus, a car swerves toward her. Her heart races and sweat breaks out as she jumps out of harm's way. This mobilisation of energy is due to the action of Molly's _____.
a. somatic nervous system
b. skeletal nervous system
c. parasympathetic nervous system
d. sympathetic nervous system

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-150
Diff: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Applied

151) The branch of the autonomic nervous system that restores the body to normal functioning after arousal and is responsible for day-to-day functioning of the organs and glands is called the
a. parasympathetic nervous system.
b. sympathetic nervous system.
c. somatic nervous system.
d. spinal cord.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-151
Diff: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

152) Malcolm is studying alone in his room late at night when he hears a loud noise downstairs. His heartbeat increases significantly and his breathing becomes shallow. He wonders if a burglar has entered the house and decides to investigate. When he gets downstairs he discovers his cat has knocked over a plant stand. His body begins to relax and return to normal. Which part of his nervous system is responsible for returning Malcolm to a normal state?
a. Parasympathetic nervous system
b. Sympathetic nervous system
c. Somatic nervous system
d. Spinal cord

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-152

Diff: 2
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Applied

153) The flight-or-fight response is mobilized by the
a. central nervous system.
b. parasympathetic nervous system.
c. sympathetic nervous system.
d. somatic nervous system.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-153
Diff: 1
Page Ref: 108
Topic: The Peripheral Nervous System
Skill: Factual

154) Jesse Sullivan, the "million dollar man," is known for
a. having the first thought-controlled bionic arm.
b. discovering that long-term potentiation helps to consolidate learning.
c. his research on gene replacement therapy to regenerate lost limbs.
d. helping the army to detect where emotion and fear are processed in the brain.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-154
Diff: 1
Page Ref: 108-109
Topic: Case Study: The Million-Dollar Man
Skill: Factual

155) The endocrine system is to _____ as the nervous system is to _____.
a. glands; muscles
b. autonomic system; somatic system
c. hormones; neurotransmitters
d. hypothalamus; pituitary gland

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-155
Diff: 3
Page Ref: 110
Topic: The Endocrine System

Skill: Conceptual

156) The endocrine system consists of glands that release _____ which are carried through our blood vessels rather than our nerves.
a. neurotransmitters
b. proteins
c. hormones
d. androgens

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-156
Diff: 1
Page Ref: 110
Topic: The Endocrine System
Skill: Factual

157) The operation of the endocrine system and hormonal messages is analogous to
a. sending an email.
b. lighting an electrical fuse.
c. sending a letter through regular post.
d. filling a leaky bucket.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-157
Diff: 2
Page Ref: 110
Topic: The Endocrine System
Skill: Conceptual

158) The _____ gland was once known as the master gland because it was thought to control all the other glands in the body.
a. adrenal
b. thyroid
c. pineal
d. pituitary

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-158
Diff: 2
Page Ref: 110
Topic: The Pituitary Gland and Pituitary Hormones
Skill: Factual

159) What hormone is responsible for stretching the cervix and vagina during birth, and aiding milk flow in nursing mothers?
a. Adrenalin
b. Cortisol
c. Oxytocin
d. Estrogen

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-159
Diff: 2
Page Ref: 110
Topic: The Pituitary Gland and Pituitary Hormones
Skill: Factual

160) The pituitary or "master" gland is under control of the
a. hippocampus.
b. hypothalamus
c. thalamus.
d. amygdala.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-160
Diff: 2
Page Ref: 110
Topic: The Pituitary Gland and Pituitary Hormones
Skill: Factual

161) The _____ is sometimes called the emergency centre of the body.
a. thyroid gland
b. pituitary gland
c. pineal gland
d. adrenal gland

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-161
Diff: 3
Page Ref: 110
Topic: The Adrenal Glands and Adrenaline
Skill: Factual

162) Nokia is preparing to take her final exam in a few hours. She is very nervous and has no appetite. This may be due to the inhibition of gastrointestinal secretions caused by

a. estrogen.
b. cortisol.
c. testosterone.
d. adrenaline.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-162
Diff: 2
Page Ref: 110-111
Topic: The Adrenal Glands and Adrenaline
Skill: Applied

163) Which of the following is not a function of adrenaline?
a. Contraction of the heart muscle and constriction of the blood vessels.
b. Opening of the bronchioles in the lungs to allow inhalation of more air.
c. Prevention of fatty acid breakdown to conserve energy and body heat.
d. Opening the pupils of the eye to enable better sight in low light levels.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-163
Diff: 2
Page Ref: 110-111
Topic: The Adrenal Glands and Adrenaline
Skill: Factual

164) Which of the following statements is not true?
a. The male sex hormone is called testosterone.
b. The female sex hormone is called estrogen.
c. Only males secrete testosterone and only females secrete estrogen.
d. Both sexes manufacture some amount of the sex hormone associated with the opposite sex.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-164
Diff: 2
Page Ref: 112
Topic: Sexual Reproductive Glands and Sex Hormones
Skill: Factual

165) According to your text, research has found that _____ influences female sex drive, including levels of sexual desire, likelihood of orgasm, and commitment to relationships.
a. adrenaline

b. estrogen
c. androgens
d. testosterone

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-165
Diff: 3
Page Ref: 112
Topic: Sexual Reproductive Glands and Sex Hormones
Skill: Factual

166) Researchers have found that EEGs have _____ spatial resolution and _____ temporal resolution.
a. low; low
b. low; high
c. high; low
d. high; high

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-166
Diff: 2
Page Ref: 114
Topic: A Tour of Brain Mapping Methods
Skill: Conceptual

167) Samantha's doctor is concerned that Samantha may have a brain tumour. Which method of neuroimaging should he use to detect the tumour?
a. CT scan
b. EEG
c. MRI
d. PET scan

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-167
Diff: 2
Page Ref: 114
Topic: A Tour of Brain Mapping Methods
Skill: Applied

168) A functional MRI (fMRI) measures
a. the release of energy from water in biological tissue.
b. changes in the brain's activity levels.
c. structures of the brain.

d. structural detail of various structures.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-168
Diff: 2
Page Ref: 115
Topic: A Tour of Brain Mapping Methods
Skill: Factual

169) Transcranial magnetic stimulation
a. can enhance brain function.
b. can interrupt brain function.
c. uses strong and rapidly changing magnetic fields to induce electric fields in the brain.
d. All of the answers are correct.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-169
Diff: 3
Page Ref: 115
Topic: A Tour of Brain Mapping Methods
Skill: Factual

170) A functional MRI
a. measures tiny magnetic fields.
b. shows promise as a treatment for depression.
c. measures the change in blood oxygen level.
d. applies magnetic fields to the brain.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-170
Diff: 2
Page Ref: 115
Topic: A Tour of Brain Mapping Methods
Skill: Factual

171) The importance of Penfield's research and others like it led to the hypothesis that
a. nerves might use electrical activity to send information.
b. nerves have high temporal resolution.
c. nerves respond to chemical stimulation.
d. nerves have high spatial resolution.

Answer: a

Type: MC
Question ID: Lil 2ce 3.1-171
Diff: 3
Page Ref: 114
Topic: A Tour of Brain Mapping Methods
Skill: Conceptual

172) Rodney wanted to "have his head examined" to determine certain aspects of his personality. To do this he had to go to a
a. phrenologist.
b. psychiatrist.
c. psychologist.
d. scientologist.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-172
Diff: 1
Page Ref: 113
Topic: A Tour of Brain Mapping Methods
Skill: Applied

173) All of the following are (or were) methods for mapping the brain except
a. stereotaxic methods.
b. electrical stimulation.
c. fRNA.
d. phrenology.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-173
Diff: 2
Page Ref: 113-114
Topic: A Tour of Brain Mapping Methods
Skill: Conceptual

174) A technique that permits scientists to pinpoint the location of specific brain areas using coordinates is called
a. the stereotaxic method.
b. functional imaging.
c. phrenology.
d. magnetoencephalography.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-174

Diff: 3
Page Ref: 113-114
Topic: A Tour of Brain Mapping Methods
Skill: Factual

175) An area of damage in the brain due to injury, disease, or surgery is called
a. an invasive cortical manifestation.
b. a stereotaxic infiltration.
c. a lesion.
d. a wound.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-175
Diff: 2
Page Ref: 113
Topic: A Tour of Brain Mapping Methods
Skill: Factual

176) EEGs are an old method that
a. has high spatial resolutions.
b. is no longer used.
c. has low temporal resolution.
d. is used to study brain activity in schizophrenics.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-176
Diff: 2
Page Ref: 114
Topic: A Tour of Brain Mapping Methods
Skill: Factual

177) Evidence against the 10 percent myth (we only use 10 percent of our brains) comes from
a. psychics who are able to perform extraordinary feats of mental powers.
b. neuroimaging studies, which fail to find any consistently silent areas.
c. the effectiveness of self-help books to increase mental capacity.
d. courses to improve our brain power that are generally successful.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-177
Diff: 2
Page Ref: 116-117
Topic: How Much of Our Brain Do We Use?

Skill: Factual

178) Which of the following statements is true?
a. All the brain areas become active on brain scans at one time or another as we think, feel, and perceive.
b. Losses of small areas of certain parts of the brain can cause devastating, often permanent, losses of function.
c. Every part of the brain has a function.
d. All of the answers are correct.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-178
Diff: 3
Page Ref: 116-117
Topic: How Much of Our Brain Do We Use?
Skill: Conceptual

179) What is the danger of relying too much on neuroimaging tests?
a. We will give up using traditional psychological tests for assessing brain functions.
b. We will pay too much attention to how different parts of the brain work together rather than focusing on individual parts and how they function.
c. We may focus too much on activity in areas that are not traditionally thought to be specialized for a particular function.
d. We run the risk of assigning narrowly defined functions to brain regions, rather than remembering that most functions are distributed.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-179
Diff: 3
Page Ref: 117-118
Topic: Which Parts of Our Brains Do We Use for What?
Skill: Factual

180) Which of the following statements is true?
a. Not every part of the brain has a function.
b. Few if any complex psychological functions are likely to be confined to a single brain area.
c. Most people use only 10 percent of their brains.
d. Scientists have discovered a specific "God spot" in the brain because it becomes active when an individual thinks of God.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-180

Diff: 3
Page Ref: 117-118
Topic: Which Parts of Our Brains Do We Use for What?
Skill: Factual

181) _____ refers to cognitive functions that rely more on one side of the brain than the other, whereas _____ refers to areas of the brain that are active above baseline during a psychological task.
a. Localisation; lateralisation
b. Lateralisation; localisation
c. Temporal resolution; spatial resolution
d. Spatial resolution; temporal resolution

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-181
Diff: 3
Page Ref: 117-119
Topic: Which Parts of Our Brains Do We Use for What? & Which Side of Our Brains Do We Use for What?
Skill: Factual

182) Sometimes a person's corpus callosum is split, which separates the two hemispheres completely. This is done to
a. control epilepsy.
b. determine the precise area of cognitive functioning.
c. study the effects of a split brain.
d. change a person's personality.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-182
Diff: 2
Page Ref: 118
Topic: Which Side of Our Brains Do We Use for What?
Skill: Factual

183) When a cognitive function relies on one cerebral hemisphere more than the other, this phenomenon is known as
a. lateralisation.
b. right-brained or left-brained people.
c. self-awareness.
d. long-term potentiation.

Answer: a
Type: MC

Question ID: Lil 2ce 3.1-183
Diff: 2
Page Ref: 118
Topic: Which Side of Our Brains Do We Use for What?
Skill: Factual

184) The corpus callosum
a. causes a vegetative state when severed accidentally.
b. shares information between the two halves of the cerebral cortex.
c. is made of fibrous muscle that holds the hemispheres together.
d. None of the answers are correct.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-184
Diff: 1
Page Ref: 118
Topic: Which Side of Our Brains Do We Use for What?
Skill: Factual

185) Your friend Sheila says she is definitely a right-brained person because she excels in her language and art classes but performs miserably in her math classes. You tell her
a. there is no scientific evidence for this type of hemispheric asymmetry for complex tasks, and actually the two hemispheres function together.
b. she has it backwards: if she likes language but dislikes math, she must be left-brained.
c. she needs to also assess her handedness before reaching this conclusion.
d. indeed there is scientific evidence for some specialisation across hemispheres so she must have greater activation of one hemisphere compared to the other.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-185
Diff: 2
Page Ref: 118-119
Topic: Which Side of Our Brains Do We Use for What?
Skill: Applied

186) Left-brained people are
a. analytical.
b. scholarly.
c. logical.
d. None of the answers are correct. It's a myth.

Answer: d
Type: MC

Question ID: Lil 2ce 3.1-186
Diff: 2
Page Ref: 118-119
Topic: Which Side of Our Brains Do We Use for What?
Skill: Factual

187) The myth of exaggerated right-brain versus left-brain differences can be traced to
a. self-help books.
b. vast oversimplifications.
c. misinterpretations of what scientists reported.
d. All of the answers are correct.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-187
Diff: 2
Page Ref: 118-119
Topic: Which Side of Our Brains Do We Use for What?
Skill: Factual

188) People's genetic makeup is their
a. genome.
b. genotype.
c. phenotype.
d. mRNA.

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-188
Diff: 1
Page Ref: 121
Topic: How We Come to Be Who We Are
Skill: Factual

189) Sophia’s parents both have brown eyes, while Sophia has blue eyes. It is likely that Sophia
a. is adopted.
b. inherited dominant genes for eye colour.
c. inherited recessive genes for eye colour.
d. inherited both dominant and recessive genes for eye colour.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-189
Diff: 3
Page Ref: 121

Topic: How We Come to Be Who We Are
Skill: Applied

190) Phenotype is
a. made up of dominant genes only.
b. made up of recessive genes only.
c. a person's genetic makeup.
d. the set of observable traits.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-190
Diff: 1
Page Ref: 121
Topic: How We Come to Be Who We Are
Skill: Factual

191) The set of observable traits an individual has is called their _____, which is based on their genetic makeup or _____.
a. genotype; phenotype
b. phenotype; genotype
c. chromosomes; genes
d. genes; chromosomes

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-191
Diff: 2
Page Ref: 121
Topic: How We Come to Be Who We Are
Skill: Factual

192) Darwin hypothesised that populations of organisms, rather than individuals, change by selective breeding with other organisms possessing some apparent advantage. This is known as
a. behavioural genetics.
b. behavioural adaptation.
c. brain evolution.
d. natural selection.

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-192
Diff: 2
Page Ref: 121
Topic: How We Come to Be Who We Are

Skill: Factual

193) How many chromosomes do humans have?
a. 12
b. 22
c. 23
d. 46

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-193
Diff: 1
Page Ref: 121
Topic: How We Come to Be Who We Are
Skill: Factual

194) Those with heightened levels of _____ have a better chance of passing on their genes to later generations.
a. adaptations
b. phenotypes
c. genotypes
d. fitness

Answer: d
Type: MC
Question ID: Lil 2ce 3.1-194
Diff: 2
Page Ref: 121
Topic: How We Come to Be Who We Are
Skill: Factual

195) The largest brain in the animal kingdom belongs to
a. the sperm whale.
b. gorillas.
c. humans.
d. elephants.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-195
Diff: 2
Page Ref: 122
Topic: How We Come to Be Who We Are
Skill: Factual

196) What animal has the biggest brain proportional to their body size?

a. Sperm whales
b. Dolphins
c. Humans
d. Apes

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-196
Diff: 2
Page Ref: 122
Topic: How We Come to Be Who We Are
Skill: Factual

197) The following are misconceptions about heritability except
a. heritability is estimated by family studies, twin studies, and adoption studies.
b. heritability applies to a single individual rather than differences among individuals.
c. heritability is a fixed number.
d. heritability tells us whether a trait can be changed.

Answer: a
Type: MC
Question ID: Lil 2ce 3.1-197
Diff: 3
Page Ref: 122-124
Topic: Behavioural Genetics: How We Study Heritability
Skill: Conceptual

198) _____ refers to the extent to which genes set limits on how much a trait can change in response to new environments.
a. Heritability
b. Reaction range
c. Behavioural genetics
d. Evolution

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-198
Diff: 1
Page Ref: 123
Topic: Behavioural Genetics: How We Study Heritability
Skill: Factual

199) Fraternal twins share approximately ___ percent of their genetic material.
a. 25
b. 50

c. 80
d. 100

Answer: b
Type: MC
Question ID: Lil 2ce 3.1-199
Diff: 1
Page Ref: 124
Topic: Behavioural Genetics: How We Study Heritability
Skill: Factual

200) The following studies determine how much genetics contributes to the expression of that trait or disorder except
a. twin studies where researchers investigate whether identical twins are more alike on a psychological characteristic, like intelligence or extraversion, than are fraternal twins, and thus can infer that this characteristic is genetically influenced.
b. family studies where researchers examine the extent to which a trait "runs" or goes together in intact families, those in which all family members are raised in the same home.
c. adoption studies where adoption agencies frequently place children in homes similar to those of the biological parents.
d. None of the answers are correct.

Answer: c
Type: MC
Question ID: Lil 2ce 3.1-200
Diff: 3
Page Ref: 124-125
Topic: Behavioural Genetics: How We Study Heritability
Skill: Factual

Chapter 3: BIOLOGICAL PSYCHOLOGY
Critical Thinking Questions

1) With all the different methods for studying the brain, how does one decide which one to use?

Answer: Answers will vary but should contain the following for full credit.

--There are many different methods for studying the brain. The method one uses often is determined by factors such as the invasiveness of the procedure or the purpose of the study. For example, because it's non-invasive, researchers frequently use EEG in both animal and human experiments. The method has a high temporal resolution ("temporal" refers to time and "resolution" refers to sharpness of image), meaning it can detect very rapid changes in the overall electrical activity of the brain occurring in the range of milliseconds. Even though the EEG is an old method, researchers still use it to study brain activity in normal brains and in brains of individuals afflicted with schizophrenia, epilepsy, and other psychiatric and neurological disorders. But EEGs have a few disadvantages. Because they show averaged activity that reaches the surface of the scalp, they tell us little, if anything, about what's happening inside neurons. Furthermore, EEGs have low spatial resolution, meaning that they aren't especially good for determining where in the brain the action is occurring.

--Although electrical recording and stimulation provided the initial probes to map mind functions onto brain areas, a virtual explosion of brain research occurred with the advent of brain scans or what we call neuroimaging. Researchers developed imaging methods to meet clinical and research needs unmet by other techniques. Each imaging method offered some advantage over previous methods. As a group, these imaging methods enable us to peer inside the brain or body.

--The CT scan shows much more detail than an individual x-ray. The MRI shows structural detail using a totally different principle. The MRI scanner measures the release of energy from water in biological tissues following exposure to a uniform magnetic field. MRI images are superior to CT scans for detecting soft tissues, such as those in the brain. A brain tumour shows up particularly well on an MRI image because a tumour consists of soft tissue. Neuroscientists interested in thinking and emotion typically don't use CT or MRI scans, except to localise brain damage. Instead, they typically use the functional imaging techniques.

--Positron emission tomography (PET) is a functional imaging technique, which means that it measures changes in the brain's activity levels. PET relies on the fact that neurons, like other cells in the body, increase their uptake of glucose when they're active. PET is an invasive tool that requires the injection of glucose-like molecules attached to radiotracers into the patient. Radiotracers are radioactive, but because they're short-lived, they do little or no harm. The scanner measures where in the brain the most glucose-like molecules are taken up, allowing neuroscientists to figure out which parts of the brain are most active during a psychological task. Clinicians use PET scans to see where brain activity increases when patients, such as those with Parkinson's disease, take a medication. Because PET is invasive, researchers later looked for functional imaging methods that wouldn't require injections of radiotracers.

--The discovery of the blood oxygenation level dependent (BOLD) response enabled the development of the functional MRI, known as fMRI. As neural activity picks up its pace, there's an increase in oxygenated blood in response to increased demand. Because fMRI measures the change in blood oxygen level, it's an indirect correlate of neural activity. Neuroscientists frequently use fMRI to image brain activity. The fMRI relies on magnetic fields, as does MRI. Whereas MRI has a high resolution, fMRI operates at a low resolution so that researchers can snap many scans in rapid succession. Individual fMRI images aren't very sharp, but the method shows changes in brain activity level over time because it creates a series of images.

Type: ES
Question ID: Lil 2ce 3.5-1
Difficulty: 2
Page Ref: 113-115
Topic: A Tour of Brain Mapping Methods
Skill: Conceptual

2) Why should one be cautious of interpretation of research results? Cite examples from this chapter to support your answer.

Answer: Answers will vary but should contain the following for full credit.

--One should be cautious of interpretation of research results especially if little replication of the research has been done. Often misconceptions stem from misinterpretations of findings or from findings that have not been substantiated through replication. For example, the whole left-brained, right-brained people argument developed due to too much emphasis on localisation of function.

--The media are quick to jump on preliminary findings and treat them as gospel truth. The example of the discovery of the “God spot” is just such an occurrence.

--The myth of left-brained people versus right-brained people is also an example of placing too much emphasis on lateralisation of function. After numerous studies investigating this matter, it was concluded that we use both sides of our brain in a complementary way.

Type: ES
Question ID: Lil 2ce 3.5-2
Difficulty: 3
Page Ref: 115-119
Topic: A Tour of Brain Mapping Methods
Skill: Conceptual

3) Will people paralyzed from spinal cord injury walk again some day?

Answer: Answers will vary but should contain the following for full credit.

--Currently, many people suffering from brain and spinal cord injuries don't have much hope of recovery. Some patients and experimental animals recover sensory and motor function following certain treatments, but the degree of recovery varies greatly. Neurons respond to chemicals called neurotrophic factors that aid their survival and stimulate growth ("trophic" means "growth"). Just the right amount and the right kind of neurotrophic factor can coax an axon into growing. Another way researchers get axons to grow is to use "glial cell bridges"–trails of glial cells that make a path for axon growth. Glial cell bridges provide structural support to guide growing axons and release neurotrophic factors along the way. Other conditions, such as a positive motivational state or mood on the part of the patient, also facilitate nerve regeneration following spinal cord injury.

--Stem cells provide at least three novel ways of treating neurodegenerative disease. First, researchers can implant stem cells directly into the host's nervous system and induce them to grow and replace damaged cells. Second, researchers can genetically engineer stem cells so that the cells can administer gene therapy; in other words, provide the patient with replacement genes. Third, scientists can acquire a better understanding of how neurons age through research on stem cells.

--There's yet another way that researchers may be able to get around the problems associated with lack of regeneration following injury and with neural degeneration. Neurogenesis is the creation of new cells in the adult brain. Neurogenesis is exciting because it opens up new possibilities. Another role might be recovery following brain injury. By manipulating neurogenesis, the adult nervous system might be coaxed into better healing itself.

Type: ES
Question ID: Lil 2ce 3.5-3
Difficulty: 3
Page Ref: 97-99
Topic: Neural Plasticity: How and When the Brain Changes
Skill: Applied