Biopsychology Fundamentals and Contemporary Issues 1st edition Shapiro Test Bank

SKU: 9781453392942-TEST-BANK

Chapter 2 Functional Anatomy

MULTIPLE CHOICE

1. The central nervous system (CNS) is made up of
a. the brain.
b. the brain and spinal cord.
c. the brain, the spinal cord, and nerves going to glands.
d. the brain, the spinal cord, and nerves going to muscles.
e. the brain, the spinal cord, and nerves going to gland and muscles.

ANS: B DIF: Easy

2. A unique cell of the nervous system that can send signals is called a(n)
a. axon.
b. glion.
c. hepatic cell.
d. neurocyte.
e. neuron.

ANS: E DIF: Easy

3. The nucleus, rough endoplasmic reticulum, mitochondria, ribosomes are all types of
a. organelles.
b. neuroglia.
c. organs.
d. cytoplasm.
e. organoplasm.

ANS: A DIF: Moderate

4. Dendrites
a. send signals away from a neuron.
b. make energy in the form of ATP in a neuron.
c. contain genetic material in the form of DNA within a neuron.
d. receive signals from other neurons and transmit that information to the cell body.
e. contain neurotransmitters.

ANS: D DIF: Easy

5. Typically, one axon leaves the neuron and branches into axon collaterals, which then branch again into _____toward the end of the axon, and then finally end in _____.
a. axon bifurcation, terminal boutons
b. terminal branches, terminal boutons

Created exclusively for Jonathan Muterera <jonathanm@nipissinngu.ca>

c. terminal filaments, terminal endings
d. terminal branches, terminal endings
e. filament collaterals, stop-end terminals

ANS: B DIF: Moderate

6. The fatty insulation that surrounds axons is called
a. myelin.
b. Ranvier.
c. adipose.
d. porcelain.
e. mitrial.

ANS: A DIF: Easy

7. You accidentally step on a tack, causing your foot to shoot up before you even realize what you have done. This is because of a reflex arc that is made up of _____ (afferent) neurons that bring information from your foot to the spinal cord and _____(efferent) neurons that send information to muscle.
a. motor, sensory
b. aplexic, eplexic
c. tensor, reflector
d. pain, muscle
e. None of the above are correct.

ANS: E DIF: Difficult

8. Which glial cell creates myelin for neurons in the peripheral nervous system?
a. astrocytes
b. oligodendrocytes
c. microglia
d. Schwann cells
e. microglia

ANS: D DIF: Moderate

9. Which is the best description of the function of microglia?
a. They bring nutrients from the vascular system to neurons in the CNS.
b. They create myelin for neurons in the CNS.
c. They act as the immune system for the CNS, fighting off diseases, and they remove damaged neurons.
d. They create myelin for neurons in the PNS.
e. They create neurotransmitters to be used by neurons in the PNS.

ANS: C DIF: Moderate

Created exclusively for Jonathan Muterera <jonabarm@nipissinngu.ca>

10. When standing straight up, the top of your brain (the highest point) is referred to as
a. dorsal.
b. ventral.
c. rostral.
d. inferior.
e. posterior.

ANS: A DIF: Moderate

11. A brain slice down the longitudinal fissure from the anterior to the posterior of the brain would produce a _____ cut.
a. coronal
b. transverse
c. horizontal
d. sagittal
e. bilateral

ANS: D DIF: Moderate

12. The motor cortex in the right hemisphere affects muscle activity on the left side of the brain. In other words, the nerve tracts from the motor cortex cross over to the other side of the body. This is known as _____influence.
a. lateral
b. transverse
c. contralateral
d. ipsilateral
e. translateral

ANS: C DIF: Moderate

13. You're going for a walk on a trail in the mountains. You suddenly spot a bear upon a hill that begins running towards you. Which of the following branch(es) of the nervous system become active?
a. sympathetic nervous system
b. autonomic nervous system
c. somatic nervous system
d. peripheral nervous system
e. More than one of the above is correct.

ANS: E DIF: Hard

14. Which of the following is NOT one of the twelve cranial nerves?
a. optic
b. trigeminal
c. orthogonal

Created online review for Jonathan Mutereka <jonathanm@nipissingu.ca>

d. vagus
e. All of the above are cranial nerves.

ANS: C DIF: Hard

15. Which of the following cranial nerves relays information about hearing and balance?
a. facial nerve (VII)
b. vestibulocochlear nerve (VIII)
c. accessory nerve (XI)
d. trochlear (IV)
e. hypoglossal nerve (XII)

ANS: B DIF: Hard

16. Sensory information enters the spinal cord through the _____ root.
a. dorsal
b. ventral
c. contralateral
d. medial
e. lateral

ANS: A DIF: Hard

17. The meningeal layer that is thin and lies directly against the cortex of the brain is called the
a. dura mater.
b. corona mater.
c. pia mater.
d. arachnoid membrane.
e. dosent mater.

ANS: C DIF: Moderate

18. Which area of the meninges is filled with cerebral spinal fluid and blood vessels?
a. arachnoid
b. dura mater
c. pia mater
d. hema mater
e. choroid mater

ANS: A DIF: Moderate

19. Where is cerebral spinal fluid created?
a. dorsolumbar spine
b. dorsal horn of the spinal cord
c. arachnoid membrane

Created exclusively for Jonathan Muterera <jonathanm@nipissinngu.ca>

d. the meninges
e. the choroid plexus
ANS: E DIF: Hard

20. The large spaces within the brain that are filled with cerebral spinal fluid are called
a. ventricles.
b. vesicles.
c. cerebral spaces.
d. arachnoid spaces.
e. foraman magnum.

ANS: A DIF: Easy

21. Which of the following is not an embryological subdivision of the brain?
a. telencephalon
b. mytricalcephalon
c. diencephalon
d. metencephalon
e. mesencephalon

ANS: B DIF: Moderate

22. On the surface of the cortex are bumps called _____ and depressions called sulci.
a. fissures
b. protuberances
c. gyri
d. peduncles
e. gendries

ANS: C DIF: Easy

23. What is the name given to the large tracts of myelinated nerve fibers connecting the left and right hemisphere?
a. the corpus callosum
b. the longitudinal fissure
c. the lateral bisection
d. the medial tract
e. the lateral commissure

ANS: A DIF: Moderate

24. Jean was in an automobile accident and received damage to an area of the cerebral cortex. Since his accident, he had difficulty with visual processing. Which area of the brain was likely damaged?
a. frontal lobe

Created exclusively for Jonathan Muterera <jonathanm@nipissinngu.ca>

b. hippocampus
c. occipital lobe
d. amygdala
e. hypothalamus

ANS: C DIF: Moderate

25. The amygdala, fornix, cingulate cortex, septum, and hippocampus collectively make up the
a. cerebral cortex.
b. globus pallidus.
c. basal ganglia.
d. striatum.
e. limbic system.

ANS: E DIF: Easy

26. What is the primary function of the basal ganglia?
a. regulating emotional memory
b. regulating special memory
c. coordinating smooth muscle movement
d. relaying sensory information
e. regulating hormones in the body

ANS: C DIF: Moderate

27. Which of the following structures is highly involved in motivation and plays a significant role in addiction?
a. the striatum
b. the nucleus accumbens
c. the globus pallidus
d. the hippocampus
e. the fornix

ANS: B DIF: Hard

28. The thalamus is part of which division of the brain?
a. telencephalon
b. diencephalon
c. mesencephalon
d. metencephalon
e. myelencephalon

ANS: B DIF: Moderate

Created exclusively for Jonathan Muterera <jonathanm@nipissinngu.ca>

29. While lying in bed, staring at the ceiling, Max suddenly shifted his gaze to the wall to his right to see a large spider crawling quickly across. This reflexive shift in vision was part of which area of the tectum?

a. the inferior colliculus
b. the posterior colliculus
c. the lateral colliculus
d. the medial colliculus
e. the superior colliculus

ANS: E DIF: Hard

30. The _____ is (are) in the mesencephalon that houses neurons with the neurotransmitter dopamine. Neurons from this area send projections to several areas of the brain including the striatum.

a. periaqueductal gray (PAG)
b. red nucleus
c. fornix
d. amygdala
e. substantia nigra

ANS: E DIF: Hard

31. The large structure just inferior (below) the occipital lobe that appears to be separate from the rest of the brain is called the

a. cerebellum.
b. frontal lobe.
c. tectum.
d. thalamus.
e. None of the above are correct.

ANS: A DIF: Easy

32. The medulla oblongata is not responsible for

a. regulating breathing.
b. regulating hormone release.
c. regulating blood pressure.
d. causing involuntary vomiting.
e. All of the above are functions of the medulla oblongata.

ANS: B DIF: Hard

33. The _____cells have highly branched dendrites make more connections than any other type of neuron. They are found in great abundance in the cerebellum.

a. multipolar
b. bipolar
c. Purkinje

Created exclusively for Jonathan Muterera <jonathanm@nipissingu.ca>

d. Batsian
e. stellate

ANS: C DIF: Hard

34. Another name for the brain stem is the
a. thalamus.
b. hypothalamus.
c. tectum.
d. cerebellum.
e. medulla oblongata.

ANS: E DIF: Moderate

35. Which of the following big brain projects started in Switzerland with the goal of digitally reconstructing brain tissues in a computer?
a. the Blue Brain Project
b. the Human and Animal Project (HBAP)
c. the Brain Initiative
d. Project MindScope
e. the DARPA Brain Initiative

ANS: A DIF: Moderate

36. The primary goal of Project MindScope was to map the _____ in mice.
a. occipital lobe
b. spinal cord
c. auditory system
d. vascular system
e. visual system

ANS: E DIF: Hard

37. The division of the peripheral nervous system responsible for the conscious control of muscle movement is called the _____ nervous system.
a. autonomic
b. parasympathetic
c. paramuscularic
d. somatic
e. sympathetic

ANS: D DIF: Moderate

38. Which of the following best describes the goals of the International Brain Lab (IBL)?
a. to map out the neurons in the visual system of mammals
b. to simulate a brain in a computer

Created exclusively for Jonathan Muterera <jonathanm@nipissinngu.ca>

c. to trace the long tracts of the axons that travel through the brain using tractography
d. to create a virtual lab to look at an animal brain in its entirety when animals are doing complex behavior like foraging
e. All of the above are major goals of the IBL.

ANS: D DIF: Hard

39. The globus pallidus is part of which larger interconnected system?
a. the limbic system
b. the white-tract system
c. the mesotelencephalic dopamine system
d. the basal ganglia
e. the medulla oblongata

ANS: D DIF: Hard

40. In terms of anatomical structure directions, the frontal lobe is _____ to the rest of the brain.
a. posterior
b. inferior
c. anterior
d. medial
e. contralateral

ANS: C DIF: Easy

COMPLETION

41. The _____ surrounds a neuron and is made of two layers of phospholipids. It separates the intracellular fluid from the extracellular fluid.

ANS: neuron membrane DIF: Moderate

42. Dendritic _____ are tiny protuberances on dendrites that receive signals from the terminal ends of axons.

ANS: spines DIF: Moderate

43. Vesicles at the terminal boutons hold _____ that act as chemical messengers to other neurons.

ANS: neurotransmitters DIF: Easy

44. The many areas of a myelinated axon that do not contain myelin are called the _____.

Created exclusively for Jonathan Muterera <jonathanm@nipissinngu.ca>

ANS: nodes of Ranvier DIF: Hard

45. An _____ is the star-shaped glial cell that serves many functions in the central nervous system, including providing nutrients, repairing the damage, and facilitating communication between neurons.

ANS: astrocyte DIF: Moderate

46. _____ creates myelin for the axons of neurons in the central nervous system.

ANS: Oligodendrocyte DIF: Hard

47. In terms of directions, nerve tracts that remain on the same side of the brain are called _____, which is the opposite of contralateral.

ANS: ipsilateral DIF: Moderate

48. The _____ nerve is the tenth (X) cranial nerve, and it helps to control activity in the heart, lungs, and digestive system.

ANS: vagus DIF: Hard

49. The thick meningeal layer closest to the skull is called the _____.

ANS: dura mater DIF: easy

50. _____is the lobe of the cerebral cortex that is most anterior.

ANS: Frontal DIF: Easy

SHORT ANSWER QUESTIONS

51. Draw a prototypical multipolar neuron and label and describe the function of the following structures: dendrites, axon, cell body, myelin, nodes of Ranvier, axon collaterals, and terminal boutons.

ANS:

a) *Dendrites: bring information to the cell body*
b) *Axon: sends information away from the cell body*
c) *Cell body: contains organelles*
d) *Myelin: surrounds and insulates the axon and speeds up signaling*
e) *Nodes of Ranvier: the spaces on a myelinated axon without myelin*
f) *Axon collaterals: branch off of the main axon allowing for signaling to many neurons*
g) *Terminal boutons: the button-like ends of an axon*

Created exclusively for Jonathan Muterera <jonathanm@nipissinngu.ca>

DIF: Moderate

52. List the major structures of the limbic system. Describe some of the theoretical functions of the limbic system.

ANS:

a) *Amygdala, hippocampus, cingulate cortex, fornix, septum, and ventromedial prefrontal cortex*
b) *Involved in emotions, motivation, sexual behavior, forming memories, and odor perception*

DIF: Moderate

53. Describe the story of the frontal lobotomy. Who were some of the doctors involved? How was this procedure performed, who tended to receive lobotomies, and what were the outcomes?

ANS:

a) *A procedure of breaking up tissue in the frontal lobe either through a leucotome put through a hole in the temple, or an ice pick-like device put through the skull just above the eyeball through the eye socket*
b) *First performed by Antonio Moniz but later promoted heavily by Walter Freeman*
c) *Around 40,000 people around the US received a lobotomy. Used to attempt to treat schizophrenia and depression, but also just as an attempt to control people, especially women*
d) *Mixed results from loss of motivation, reverted to childlike behavior, low cognitive functions, and even death*

DIF: Moderate

54. Describe the processes of action if a person accidentally touches a hot stove. Label the structures involved in this reflex.

ANS:

a) *Sensory (afferent) nerves send a signal to the spinal cord entering the dorsal horn.*
b) *Sensory nerves affect interneurons, which affect motor (efferent) nerves, which affect muscles, which cause the finger to pull back.*
c) *Sensory → interneuron → motor neuron makes up a reflex arc.*

DIF: Hard

55. Provide the name and functions of the glial cells in the central and peripheral nervous system.

ANS:

Created exclusively for Jonathan Winters <jonathanm@nipissingu.ca>

a) *Astrocyte in the CNS that provides nutrients repairs damage, and helps with neuron communication.*
b) *Oligodendrocytes in the CNS creates myelin for the axons for several neurons.*
c) *Microglia act in the role of immunization in the CNS and also remove dead cells and nonfunctioning connections between neurons (synapses). Microglia are important in the developing brain.*
d) *Schwann cells create myelin in the PNS. Many Schwann cells are needed to create myelin for one axon of a peripheral nerve. Schwann cells also help guide the regrowth of severed axons.*

DIF: Hard

56. List the major divisions of the CNS and PNS (not embryological divisions of the brain) and the basic function of these divisions.

ANS:
a) *CNS: Brain and spinal cord*
b) *PNS:*
    a. *Somatic nervous system: controls conscious muscle movement*
    b. *Autonomic nervous system: regulates systems that are out of conscious control*
        i. *Sympathetic: quickly activates the body when the person (or animal) is in danger; fight-or-flight system*
        ii. *Parasympathetic: counteracts the sympathetic nervous system activity; active when relaxed and safe*

DIF: Moderate

57. Draw the cerebral cortex, labeling the four major lobes. Describe the theoretical function of each lobe.

ANS:
a) *Frontal lobe: planning, motivation, decision making, problem solving, and other higher cognitive functions*
b) *Parietal lobe: integration of sensory systems*
c) *Occipital lobe: visual processing and perception of color, patterns, and motion*
d) *Temporal lobe: language, auditory perception, perception of complex structures like shapes and faces*

DIF: Easy

ESSAY

58. List the major structures of the mesencephalon, including their theoretical functions.

ANS:
a) *The superior colliculus controls eye-tracking and reflexive eye movement and orientation.*

Created exclusively for Jonathan Matutera <jonathanm@nipissinngu.ca>

b) *The inferior colliculus controls reflective reaction to sounds.*
c) *The periaqueductal gray (PAG) receives information about emotional states from the amygdala for a fight-or-flight reaction. It also affects pain perception.*
d) *The substantia nigra has dopamine cells that send projects to the striatum for smooth muscle movement.*
e) *The ventral tegmental area (VTA) has dopamine cells that project to the forebrain and is involved in motivation.*
f) *The red nucleus is involved in coordinated walking, especially in four-legged animals.*

DIF: Hard

59. List three large brain projects around the world and provide examples of their research and collaboration interests.

ANS:
a) *The Blue Brain Project: reverse-engineering and mapping the mouse neocortex; artificially simulating brain activity*
b) *The Human Brain Project: brain and neuron stimulation, brain mapping, and creating easy access to medical information about brain disorders; programming inspired by brain activity*
c) *The Brain Initiative: neuroimaging and staining collaboration focused on brain diseases and disorders*
d) *DARPA's SyNAPSE: trying to create a computer patterned on the brain*
e) *The International Brain Lab: creating a virtual lab to look at the entire brain of animals while they do complex behaviors like foraging*

DIF: Moderate

60. List the 12 cranial nerves and provide information about whether each nerve serves sensory or motor (or both) functions. Describe at least one of each nerve's functions.
I. *Olfactory nerve: sensory sense of smell*
II. *Optic nerve: sensory information from the eye for vision*
III. *Oculomotor nerve: motor for moving the eye and eye dilation*
IV. *Trochlear nerve: motor for eye movement*
V. *Trigeminal nerve: sensory and motor for chewing and sensation on the face*
VI. *Abducens nerve: motor for eye movement*
VII. *Facial nerve: sensory and motor for facial expression and taste*
VIII. *Vestibulocochlear nerve: sensory for hearing and balance*
IX. *Glossopharyngeal nerve: sensory and motor for of head, neck, and tongue*
X. *Vegas nerve: sensory and motor for heart, lungs, and digestion*
XI. *Accessory nerve: motor for head and neck*
XII. *Hypoglossal nerve: motor for the tongue*

DIF: Hard

Created exclusively for Jonathan Winterera <jonathanm@nipissinngu.ca>