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CHAPTER 3 Anatomy of the Nervous System: Systems, Structures, and Cells That Make Up Your Nervous System

MULTIPLE CHOICE QUESTIONS

2) The CNS is composed of two major divisions: the A) ANS and PNS.
B) brain and brain stem.
C) SNS and ANS.
D) spinal cord and brain stem.
E) none of the above
Answer: E
Diff: 2 Page Ref: 52
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

3) The ANS is part of the
A) sympathetic nervous system.
B) parasympathetic nervous system.
C) brain.
D) CNS.
E) none of the above
Answer: E
Diff: 2 Page Ref: 53
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

4) The somatic nervous system
A) is part of the PNS.
B) participates in sensory and motor interactions with the external environment.
C) is part of the ANS.
D) all of the above
E) both A and B Answer: E

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Diff: 2 Page Ref: 53 Topic: 3.1 General Layout of the Nervous System Type: (Factual)

5) In general, afferent nerves carry sensory information

A) to the CNS.
B) to the PNS.
C) from the CNS.
D) from the cortex.
E) from the brain.

Answer: A

Diff: 1 Page Ref: 53
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

6) Neurons of the sympathetic nervous system are part of the A) somatic nervous system.
B) basal ganglia.
C) ANS.
D) peripheral nervous system.
E) both C and D
Answer: E
Diff: 3 Page Ref: 51
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

7) Which part of the PNS projects from only the cranial and sacral portions of the CNS?
A) parasympathetic nervous system
B) sympathetic nervous system
C) somatic nervous system
D) cranial nerves
E) autonomic nervous system
Answer: A
Diff: 2 Page Ref: 53
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

8) The sympathetic nervous system differs from the parasympathetic nervous system in that the sympathetic nervous system has

A) no first-stage neurons.
B) no second-stage neurons.
C) first-stage neurons that synapse at a substantial distance from the target organ.
D) first-stage neurons that synapse close to the target organ.
E) both B and C
Answer: C
Diff: 3 Page Ref: 53
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

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9) Which of the following generally acts to conserve the body's energy?
A) CNS
B) PNS
C) sympathetic nervous system
D) parasympathetic nervous system
E) somatic nervous system *Answer: D Diff: 2 Page Ref: 53 Topic: 3.1 General Layout of the Nervous System Type: (Factual)*

10) The first two cranial nerves are
A) olfactory and optic nerves.
B) the optic and auditory nerves.
C) the facial and auditory nerves.
D) motor.
E) both B and D
Answer: A
Diff: 3 Page Ref: 53
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

11) The vagus nerve is
A) part of the parasympathetic nervous system.
B) the tenth cranial nerve.
C) the longest cranial nerve.
D) both sensory and motor.
E) all of the above
Answer: E
Diff: 3 Page Ref: 52
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

12) The dura mater, arachnoid membrane, and pia mater are A) neurons.
B) neuroglia.
C) parts of the autonomic nervous system.
D) meninges.
E) myelin.
Answer: D
Diff: 1 Page Ref: 53
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

13) From outside to inside, the three meninges are the A) Nina, Pinta, and Santa-Maria.
B) arachnoid, dura, and pia.
C) dura, pia, and meninx.
D) dura, meninx, and pia.
E) dura, arachnoid, and pia.
Answer: E
Diff: 2 Page Ref: 53
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

14) Adhering to the surface of the brain is the
A) tough mother.
B) pia mater.
C) dura mater.
D) CSF.
E) both A and C
Answer: B
Diff: 2 Page Ref: 53
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

15) The subarachnoid space is just outside the A) neocortex.
B) arachnoid membrane.
C) arachnoid mater.
D) pia mater.
E) central canal.
Answer: D
Diff: 3 Page Ref: 53
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

16) How many ventricles are there in the brain?
A) 1
B) 3
C) 4
D) 2
E) 12
Answer: C
Diff: 2 Page Ref: 53
Topic: 3.1 General Layout of the Nervous System Type: (Factual)

17) The CSF circulates through the
A) central canal.
B) lateral ventricles.
C) subarachnoid space.
D) all of the above
E) none of the above *Answer: D Diff: 2 Page Ref: 53 Topic: 3.1 General Layout of the Nervous System Type: (Factual)*

18) Cerebrospinal fluid is produced by
A) networks of small blood vessels that protrude into the ventricles.
B) the superior sagittal sinus.
C) the arachnoid membrane.
D) the choroid plexuses.
E) both A and D
Answer: E
Diff: 3 Page Ref: 54
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

19) The cerebral aqueduct connects the
A) lateral ventricles.
B) third and fourth ventricles.
C) fourth ventricle and the central canal.
D) circus maximus and the forum.
E) left and right hemispheres.
Answer: B
Diff: 3 Page Ref: 53
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

20) When a tumor near the cerebral aqueduct causes cerebrospinal fluid to accumulate in the brain, the disorder is
A) hydrocephalus.
B) Down syndrome.
C) cranial elephantiasis.
D) multiple sclerosis.
E) Parkinson's disease.
Answer: A
Diff: 2 Page Ref: 53
Topic: 3.1 General Layout of the Nervous System
Type: (Applied)

21) Hydrocephalus results from the
A) production of too much CSF.
B) production of excessively watery CSF.
C) production of water rather than CSF.
D) breakdown of the mechanism that absorbs CSF into the lateral vesicles.
E) none of the above
Answer: E
Diff: 3 Page Ref: 54
Topic: 3.1 General Layout of the Nervous System
Type: (Applied)

22) The blood brain barrier is
A) a spongy bone.
B) located in the pia mater.
C) about the size of the cortex.
D) located in all three meninges.
E) none of the above
Answer: E
Diff: 2 Page Ref: 54
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

23) The blood brain barrier impedes the passage into cerebral neurons of A) many proteins and other large molecules.
B) all small molecules.
C) glucose.
D) sodium.
E) all fluids.
Answer: A
Diff: 3 Page Ref: 54
Topic: 3.1 General Layout of the Nervous System
Type: (Factual)

24) Neurons are specialized to receive, conduct, and transmit
A) dendrites.
B) axons.
C) synapses.
D) electrochemical signals.
E) pizzas.
Answer: D
Diff: 1 Page Ref: 56
Topic: 3.2 Cells of the Nervous System
Type: (Factual)
Rational

27) What part of a neuron is sometimes myelinated?
A) dendrites
B) axon
C) cell body
D) buttons
E) both A and B
Answer: B
Diff: 1 Page Ref: 56
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

31) The neuron membrane includes
A) a lipid bilayer.
B) channel proteins.
C) signal proteins.
D) all of the above
E) both A and B
Answer: D
Diff: 2 Page Ref: 56
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

32) Neurons with one axon and several dendrites emanating from the soma are classified as A) motor.
B) autonomic.
C) multipolar.
D) bipolar.
E) unipolar. *Answer: C Diff: 2 Page Ref: 56 Topic: 3.2 Cells of the Nervous System Type: (Factual)*

33) Interneurons
A) don't conduct signals from one structure to another; they integrate activity within a single brain structure.
B) have two short axons but no dendrites.
C) have one long axon and one short dendrite.
D) have several short axons and no dendrites.
E) have bipolar axons and no dendrites.
E) have bipolar axons and no dendrites. *Answer: A Diff: 2 Page Ref: 56 Topic: 3.2 Cells of the Nervous System Type: (Factual)*

34) Clusters of neural cell bodies in the CNS are called A) neurons.
B) ganglia.
C) nerves.
D) nuclei.
E) buttons.
Answer: D
Diff: 2 Page Ref: 56
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

35) Tracts are to nuclei as nerves are to
A) nuclei.
B) ganglia.
C) ganglion.
D) nucleus.
E) cell bodies.
Answer: B
Diff: 3 Page Ref: 56
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

37) CNS is to PNS as oligodendrocytes are to A) astrocytes.
B) oligodendroglia.
C) glial cells.
D) Schwann cells.
E) microglia.
Answer: D
Diff: 3 Page Ref: 56
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

38) In the CNS, axons are myelinated by
A) vesicles.
B) oligodendrocytes.
C) unipolar cells.
D) astrocytes.
E) Schwann cells.
Answer: B
Diff: 2 Page Ref: 56
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

39) Myelination
A) causes neural degeneration.
B) penetrates the blood brain barrier.
C) occurs only on Schwann cells.
D) increases the speed of axonal conduction.
E) increases the speed of synaptic transmission.
Answer: D
Diff: 1 Page Ref: 56
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

40) PNS is to CNS as Schwann cells are to
A) multiple sclerosis.
B) oligodendrocytes.
C) astrocytes.
D) neuroglia.
E) ANS.
Answer: B
Diff: 3 Page Ref: 56
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

28) Chemical communication among mammalian neurons often occurs

A) at points where their cell bodies contact one another.
B) across gaps called dendrites.
C) across synapses.
D) at points where their axons contact one another.
E) at points where dendrites contact one another.
E) at points where dendrites contact one another. *Answer: C Diff: 1 Page Ref: 57 Topic: 3.2 Cells of the Nervous System Type: (Factual)*

26) The soma is
A) often myelinated.
B) the cell body.
C) covered by nodes of Ranvier.
D) next to the nucleus.
E) smaller than a terminal button.
Answer: B
Diff: 1 Page Ref: 57
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

36) Many multipolar neurons have a long process emanating from the cell body. This long process is A) an axon.
B) a dendrite.
C) a button.
D) a protein.
E) a signal protein.
Answer: A
Diff: 1 Page Ref: 57
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

25) The cone-shaped structure at the boundary between the cell body and axon of a multipolar neuron is the
A) node of Ranvier.
B) dendrite.
C) axon hillock.
D) Golgi complex.
E) mitochondrion.
Answer: C
Diff: 1 Page Ref: 57
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

30) Synaptic vesicles tend to be most prevalent in the A) nucleus.
B) nodes of Ranvier.
C) postsynaptic membranes.
D) dendrites.
E) buttons.
Answer: E
Diff: 1 Page Ref: 58
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

29) Most of a neuron's DNA is in its
A) nucleus.
B) buttons.
C) synaptic vesicles.
D) mitochondria.
E) axon hillock.
Answer: A
Diff: 2 Page Ref: 58
Topic: 3.2 Cells of the Nervous System
Type: (Factual)

41) The particular glial cells that engulf cellular debris and trigger inflammation are A) microglia.
B) Schwann cells.
C) astrocytes.
D) oligodendrocytes.
E) oligodendroglia.
Answer: A
Diff: 2 Page Ref: 57
Topic: 3.2 Cells of the Nervous System

Type: (Factual)

42) The largest glial cells are
A) astrocytes.
B) Schwann cells.
C) microglia.
D) magnoglia.
E) oligodendrocytes.
Answer: A
Diff: 2 Page Ref: 57
Topic: 3.2 Cells of the Nervous System
Type: (Factual,)

43) The Golgi stain colors neurons
A) violet.
B) black.
C) blue.
D) red.
E) yellow.
Answer: B
Diff: 2 Page Ref: 61
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

44) The best thing about the Golgi stain is that it
A) is opaque.
B) reveals the inner structure of the neuron.
C) does not stain many neurons.
D) stains only Golgi neurons.
E) was developed by a Nobel Prize winner.
Answer: C
Diff: 2 Page Ref: 61
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

45) The discovery of the Golgi stain
A) was accidental.
B) was one of the major early breakthroughs in the study of the nervous system.
C) occurred in 1995.
D) all of the above
E) both A and B
Answer: E
Diff: 2 Page Ref: 61
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

46) The first neural stain revealed the silhouettes of a few neurons on a slide; it is A) the Golgi stain.
B) red.
C) the Nissl stain.
D) both A and B
E) both B and C
Answer: A
Diff: 2 Page Ref: 61
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

47) The first neural stain that permitted neuroanatomists to view some aspects of the inner structure of a neuron was
A) the Nissl stain.
B) the Golgi stain.
C) the Weigert stain.
D) mainly used for anterograde tracing.
E) electron microscopy.
Answer: A
Diff: 2 Page Ref: 61
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

48) Nissl stains (e.g., cresyl violet) are frequently used to
A) study the fine details of axonal structure.
B) determine the general distribution of cell bodies in the nervous system.
C) study the contents of neural buttons.
D) identify axosomatic synapses.
E) study the responses of Nissl bodies to stimulation.
Answer: B
Diff: 3 Page Ref: 61
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

49) The fine inner details of neuron structure can be studied best
A) with a Nissl stain.
B) by electron microscopy.
C) with cresyl violet.
D) with a Golgi stain.
E) with a microelectrode.
Answer: B
Diff: 2 Page Ref: 62
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

50) The main advantage of the scanning electron microscope over the conventional electron microscope is that it

A) operates in light.

B) is capable of higher magnification than the ordinary electron microscope.

C) produces three-dimensional images.

D) uses more protons than electrons.

E) requires fewer beams of electrons.

Answer: C

Diff: 2 Page Ref: 62

Topic: 3.3 Neuroanatomical Techniques and Directions Type: (Factual)

51) To locate the terminals of axons that project from a particular brain structure, an investigator would employ

A) a retrograde tracing technique.

B) an anterograde tracing technique.

C) labeled chemicals that are readily transported back to the neuron's nucleus.

D) a Golgi stain.

E) a Nissl stain.

Answer: B

Diff: 2 Page Ref: 62

Topic: 3.3 Neuroanatomical Techniques and Directions Type: (Factual)

52) The back of your head is
A) posterior.
B) dorsal.
C) inferior.
D) anterior.
E) ventral.
Answer: A
Diff: 2 Page Ref: 62
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

53) The top of a dog's head is
A) anterior.
B) ventral.
C) caudal.
D) dorsal.
E) posterior.
Answer: D
Diff: 2 Page Ref: 62
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

54) The tip of your nose is
A) superior and dorsal.
B) caudal and anterior.
C) medial and anterior.
D) anterior and posterior.
E) ventral and dorsal.
Answer: C
Diff: 3 Page Ref: 62
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

55) The nose of a rat is
A) medial.
B) dorsal.
C) anterior.
D) both A and C
E) both B and C
Answer: D
Diff: 3 Page Ref: 62
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

56) The spine of a human runs just beneath the body's
A) ventral surface.
B) anterior surface.
C) dorsal surface.
D) posterior surface.
E) superior surface. *Answer: C Diff: 1 Page Ref: 62 Topic: 3.3 Neuroanatomical Techniques and Directions Type: (Factual)*

57) Which of the following neuroanatomical directions is commonly used with reference to the brains of humans or other primates, but not with reference to the brains of four-legged creatures?

A) inferior
B) caudal
C) posterior
D) medial
E) lateral
Answer: A
Diff: 2 Page Ref: 62
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

58) A cut in which of the following planes would sever all of the cerebral commissures, the tracts that connect the left and right cerebral hemispheres?
A) horizontal
B) sagittal
C) midsagittal
D) frontal
E) diagonal
Answer: C
Diff: 2 Page Ref: 63
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

59) The H-shape of the spinal gray matter is most obvious in a
A) midsagittal section.
B) sagittal section.
C) longitudinal section.
D) lateral section.
E) cross section.
Answer: E
Diff: 2 Page Ref: 64
Topic: 3.4 Spinal Cord
Type: (Factual)

60) Gray matter of the spinal cord is largely composed of
A) cell bodies and unmyelinated interneurons.
B) myelin.
C) myelinated axons.
D) meninges.
E) cerebrospinal fluid.
Answer: A
Diff: 1 Page Ref: 64
Topic: 3.4 Spinal Cord
Type: (Factual)

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61) White matter is white because
A) it is unmyelinated.
B) cell bodies are white.
C) satellite cells are gray.
D) axon membranes are white.
E) myelin is white.
Answer: E
Diff: 1 Page Ref: 64
Topic: 3.4 Spinal Cord
Type: (Factual)

62) In cross section, spinal gray matter has four arms; among these are the two A) ventral roots.
B) ventral routes.
C) ventral horns.
D) lateral horns.
E) both A and B
Answer: C
Diff: 3 Page Ref: 64
Topic: 3.4 Spinal Cord
Type: (Factual)

63) How many individual dorsal roots are there in the human nervous system?
A) 12
B) 31
C) 62
D) 124
E) billions
Answer: C
Diff: 3 Page Ref: 64
Topic: 3.4 Spinal Cord
Type: (Factual)

64) How many left ventral roots are there in the human body?
A) 12
B) 31
C) 62
D) 124
E) billions
Answer: B
Diff: 3 Page Ref: 63
Topic: 3.4 Spinal Cord
Type: (Factual)

65) Most neurons of the dorsal root synapse in the A) cortex.
B) spinal cord.
C) dorsal root ganglia.
D) PNS.
E) ventral horn.
Answer: B
Diff: 2 Page Ref: 64
Topic: 3.4 Spinal Cord
Type: (Factual)

66) The neurons of the dorsal roots are
A) sensory.
B) motor.
C) tracts.
D) multipolar polar.
E) bipolar.
Answer: A
Diff: 2 Page Ref: 64
Topic: 3.4 Spinal Cord
Type: (Factual)

67) Most neurons of the ventral roots
A) are bipolar.
B) are unipolar.
C) have their cell bodies in white matter.
D) have their cell bodies in the ventral horns.
E) are interneurons.
Answer: D
Diff: 3 Page Ref: 64
Topic: 3.4 Spinal Cord
Type: (Factual)

68) "Encephalon" means within the
A) forebrain.
B) brain stem.
C) head.
D) cerebral hemispheres.
E) nervous system.
Answer: C
Diff: 2 Page Ref: 65
Topic: 3.5 Five Major Divisions of the Brain Type: (Factual)

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69) The large lateral outgrowths that compose the telencephalon are the A) eyes.
B) temporal lobes.
C) cerebral hemispheres.
D) ventricles.
E) testes.
Answer: C
Diff: 2 Page Ref: 65
Topic: 3.5 Five Major Divisions of the Brain
Type: (Factual)

70) This is an illustration of the developing neural tube. The line points to one of the brain's major divisions, the

A) diencephalon.
B) metencephalon.
C) telencephalon.
D) myelencephalon.
E) mesencephalon.
Answer: A
Diff: 2 Page Ref: 65
Topic: 3.5 Five Major Divisions of the Brain Type: (Factual)



71) The myelencephalon is often called the
A) midbrain.
B) hypothalamus.
C) brain stem.
D) medulla.
E) cortex.
Answer: D
Diff: 2 Page Ref: 65
Topic: 3.5 Five Major Divisions of the Brain Type: (Factual)

72) The caudal part of the forebrain is the
A) telencephalon.
B) diencephalon.
C) myelencephalon.
D) reticular formation.
E) midbrain.
Answer: B
Diff: 3 Page Ref: 65
Topic: 3.5 Five Major Divisions of the Brain
Type: (Factual)

73) The midbrain is
A) part of the mesencephalon.
B) part of the metencephalon.
C) the mesencephalon.
D) part of the brain stem.
E) both C and D
Answer: E
Diff: 3 Page Ref: 65
Topic: 3.5 The Five Major Divisions of the Brain Type: (Factual)

74) The myelencephalon is
A) the medulla.
B) part of the hindbrain.
C) part of the brain stem.
D) all of the above
E) none of the above *Answer: D Diff: 3 Page Ref: 65 Topic: 3.5 Five Major Divisions of the Brain Type: (Factual)*

75) Which of the following is <u>not</u> in the brain stem?
A) myelencephalon
B) mesencephalon
C) metencephalon
D) medulla
E) telencephalon
Answer: E
Diff: 2 Page Ref: 65
Topic: 3.5 Five Major Divisions of the Brain
Type: (Factual)

76) The myelencephalon is composed largely of A) ganglia.
B) tracts.
C) nerves.
D) ventricles.
E) colliculi.
Answer: B
Diff: 3 Page Ref: 65
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

77) Which of the following structures is named after a term that means "little net"?
A) reticular formation
B) mesencephalon
C) medulla
D) cerebellum
E) hippocampus
Answer: A
Diff: 1 Page Ref: 65
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

78) The reticular formation is in the
A) brain stem.
B) cortex.
C) thalamus.
D) olfactory bulb.
E) spinal cord.
Answer: A
Diff: 1 Page Ref: 65
Topic: 3.6 Major Structures of the Brain Type: (Factual)

79) This is an illustration of the human brain stem. The pointer lines point to the A) cerebellum.
B) hypothalamus.
C) reticular formation.
D) hippocampus.
E) tegmentum.
Answer: C
Diff: 2 Page Ref: 65
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

80) The reticular formation is in the core of the A) mesencephalon.
B) myelencephalon.
C) metencephalon.
D) all of the above
E) none of the above *Answer: D Diff: 3 Page Ref: 66 Topic: 3.6 Major Structures of the Brain Type: (Factual)*

81) Which of the following is a large structure visible on the dorsal surface of the human brain stem?
A) pituitary
B) cerebellum
C) optic chiasm
D) hypothalamus
E) mammillary body
Answer: B
Diff: 1 Page Ref: 66
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

82) The inferior and superior colliculi compose the A) thalamus.
B) hypothalamus.
C) tectum.
D) hippocampus.
E) cerebellum.
Answer: C
Diff: 2 Page Ref: 66
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

83) The tectum is the roof of the
A) metencephalon.
B) mesencephalon.
C) myelencephalon.
D) telencephalon.
E) diencephalon. *Answer: B Diff: 2 Page Ref: 66 Topic: 3.6 Major Structures of the Brain Type: (Factual)*

84) Which structure is not part of the tegmentum?
A) hypothalamus
B) periaqueductal gray
C) substantia nigra
D) red nucleus
E) cerebral aqueduct
Answer: A
Diff: 3 Page Ref: 66
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

85) Three major structures in the ______ of the brain are named after colors (red, black, and grey).
A) medulla
B) mesencephalon
C) tectum
D) tegmentum
E) thalamus
Answer: D
Diff: 3 Page Ref: 66
Topic: 3.6 Major Structures of the Brain
Type: (Factual)
Rationale: The three structures are the red nucleus, substantia nigra, and periaqueductal gray.

86) The neural structure situated near the duct connecting the third and fourth ventricles is the A) substantia nigra.
B) periaqueductal gray.
C) red nucleus.
D) superior colliculi.
E) cerebral aqueduct.
Answer: B
Diff: 2 Page Ref: 66
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

87) The hypothalamus and thalamus compose the A) brain stem.
B) diencephalon.
C) mesencephalon.
D) medulla.
E) pituitary.
Answer: B
Diff: 2 Page Ref: 66
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

88) The lateral geniculate, medial geniculate, and ventral posterior nuclei are all nuclei of the A) midbrain.
B) spinal cord.
C) cortex.
D) medulla.
E) thalamus.
Answer: E
Diff: 2 Page Ref: 67
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

89) Most sensory nuclei of the thalamus project to the A) cortex.
B) reticular formation.
C) cerebellum.
D) substantia nigra.
E) caudate.
Answer: A
Diff: 1 Page Ref: 67
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

90) Which of the following part of the diencephalon connects the two lobes of the thalamus?
A) massa intermedia
B) hypothalamus
C) cerebral aqueduct
D) corpus callosum
E) hippocampal commissure
Answer: A
Diff: 2 Page Ref: 67
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

91) Which of the following thalamic nuclei relays visual information?
A) pons
B) red nucleus
C) lateral geniculate
D) substantia nigra
E) ventral posterior
Answer: C
Diff: 3 Page Ref: 67
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

92) The lateral geniculate nuclei, medial geniculate nuclei, and ventral posterior nuclei are all A) diencephalic nuclei.
B) thalamic nuclei.
C) sensory relay nuclei.
D) all of the above
E) both B and C
Answer: D
Diff: 3 Page Ref: 67
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

Test Bank for Biopsychology, 9/e

93) Which structure of the diencephalon regulates the pituitary?
A) snot gland
B) hypothalamus
C) medial geniculate
D) cerebellum
E) nasal mucosa
Answer: B
Diff: 1 Page Ref: 67
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

94) The pituitary gland is situated just inferior to the A) nose.
B) hippocampus.
C) cerebellum.
D) thalamus.
E) hypothalamus.
Answer: E
Diff: 2 Page Ref: 67
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

95) Which of the following is an X-shaped structure?
A) spinal white matter
B) reticular formation
C) pituitary
D) optic chiasm
E) substantia nigra
Answer: D
Diff: 2 Page Ref: 67
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

96) Which of the following is a point of decussation?
A) optic chiasm
B) hippocampus
C) temporal lobe
D) substantia nigra
E) superior colliculus
Answer: A
Diff: 1 Page Ref: 67
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

97) This is an illustration of the A) thalamic nuclei.B) reticular nuclei.C) cerebral lobes.D) hypothalamic nuclei.E) cerebral fissures.



Answer: D Diff: 1 Page Ref: 67 Topic: 3.6 Major Structures of the Brain Type: (Factual)

98) If a midsagittal cut were made through the human brain, all of the uncut axons running from the eyes to the brain would be
A) on the right side.
B) ipsilateral.
C) contralateral.
D) decussating.
E) bilateral.
Answer: B
Diff: 3 Page Ref: 67-68
Topic: 3.6 Major Structures of the Brain
Type: (Factual)
Rationale: The specific answer to this question is not provided in this chapter, thus to get the correct answer, students must deduce it from the information that is provided.

99) The mammillary nuclei are
A) bumps visible on the dorsal surface of the medulla.
B) visible on the inferior surface of the diencephalon.
C) often considered to be nuclei of the hypothalamus.
D) found only in females.
E) both B and C
Answer: E
Diff: 3 Page Ref: 68
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

100) All mammals with lissencephalic brains
A) are accountants.
B) are flexible.
C) have smooth brains.
D) are clever.
E) are old.
Answer: C
Diff: 1 Page Ref: 68
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

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101) The large cortical ridges between fissures are called A) sulci.
B) pyramids.
C) gyri.
D) commissures.
E) lobes.
Answer: C
Diff: 1 Page Ref: 68
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

102) Big is to small as fissures are to
A) gyri.
B) pyramids.
C) commissures.
D) gyrus.
E) sulci.
Answer: E
Diff: 2 Page Ref: 68
Topic: 3.6 Major Structures of the Brain Type: (Factual)

103) The largest cerebral commissure is the A) corpus callosum.
B) massa commissura.
C) massa intermedia.
D) humungus commissura.
E) longitudinal commissure.
Answer: A
Diff: 1 Page Ref: 68
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

104) The corpus callosum is the human brain's largest A) neuron.
B) nucleus.
C) fissure.
D) commissure.
E) hemisphere.
Answer: D
Diff: 1 Page Ref: 68
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

105) The longitudinal fissure separates the two hemispheres. Which lobe does not border it?
A) temporal lobe
B) frontal lobe
C) parietal lobe
D) prefrontal lobe
E) occipital lobe
Answer: A
Diff: 2 Page Ref: 69
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

106) Between the frontal and parietal lobes is the A) central fissure.
B) lateral fissure.
C) corpus callosum.
D) temporal lobe.
E) longitudinal fissure.
Answer: A
Diff: 2 Page Ref: 69
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

107) The line points to the A) central fissure.
B) superior temporal gyrus.
C) postcentral fissure.
D) longitudinal fissure.
E) parietal lobe.
Answer: B
Diff: 2 Page Ref: 68-69



Topic: 3.6 Major Structures of the Brain Type: (Factual)

108) The lobe at the back of the brain, which serves a visual function, is the A) frontal lobe.
B) occipital lobe.
C) temporal lobe.
D) prefrontal lobe.
E) parietal lobe. *Answer: B Diff: 2 Page Ref: 68-9 Topic: 3.6 Major Structures of the Brain Type: (Factual)*

109) The functions of the occipital cortex are largely A) motor.
B) visual.
C) auditory.
D) somatosensory.
E) olfactory.
Answer: B
Diff: 1 Page Ref: 68-69
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

110) Precentral is to postcentral as
A) somatosensory is to motor.
B) auditory is to motor.
C) somatosensory is to auditory.
D) motor is to somatosensory.
E) auditory is to somatosensory.
E) auditory is to somatosensory. *Answer*: D
Diff: 2 Page Ref: 68
Topic: 3.6 Major Structures of the Brain Type: (Factual)

111) About what proportion of human cerebral cortex is neocortex?
A) 10 %
B) 25 %
C) 40 %
D) 60 %
E) 90 %
Answer: E
Diff: 2 Page Ref: 69
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

112) Which of the following are multipolar cortical neurons with long axons, apical dendrites, and triangular cell bodies?
A) stellate cells
B) chandelier cells
C) pyramidal cells
D) granule cells
E) fusiform cells
Answer: C
Diff: 1 Page Ref: 69
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

113) Neocortex contains two fundamentally different kinds of neurons: pyramidal cells and A) apical cells.
B) bipolar cells.
C) multipolar cells.
D) columnar cells.
E) stellate cells.
Answer: E
Diff: 2 Page Ref: 69
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

114) Which of the following neurons have apical dendrites?
A) interneurons
B) stellate cells
C) pyramidal cells
D) both A and B
E) none of the above
Answer: C
Diff: 2 Page Ref: 69
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

115) The hippocampus is
A) a neocortical structure.
B) in the frontal lobes.
C) six-layered.
D) shaped like a sea horse in cross section.
E) in the diencephalon.
Answer: D
Diff: 2 Page Ref: 70
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

116) The limbic system and basal ganglia are, for the most part, in the A) telencephalon.
B) diencephalon.
C) mesencephalon.
D) myelencephalon.
E) metencephalon. *Answer: A Diff: 1 Page Ref: 70 Topic: 3.6 Major Structures of the Brain Type: (Factual)*

117) A neural circuit that includes the septum, cingulate cortex, fornix, amygdala, hippocampus, hypothalamus, and thalamus is thought to be involved in the regulation of motivated behaviors. This circuit is called theA) basal ganglia.B) neocortex

B) neocortex.
C) limbic system.
D) cranial nerves.
E) somatosensory system.
Answer: C
Diff: 1 Page Ref: 70
Topic: 3.6 Major Structures of the Brain Type: (Factual)

118) A major limbic system tract is the A) corpus callosum.
B) reticular formation.
C) cingulate.
D) fornix.
E) septum.
Answer: D
Diff: 3 Page Ref: 70
Topic: 3.6 Major Structures of the Brain Type: (Factual)

119) Which of the following structures is <u>not</u> part of the limbic system?
A) hippocampus
B) septum
C) cerebellum
D) fornix
E) hypothalamus
Answer: C
Diff: 1 Page Ref: 70
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

120) Two parts of the limbic system are cortical structures. These two structures are the A) septum and the frontal cortex.
B) hippocampus and the cingulate.
C) frontal cortex and the basal ganglia.
D) hippocampus and the amygdala.
E) frontal cortex and the olfactory bulbs.
Answer: B
Diff: 3 Page Ref: 70
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

121) Portrayed in this illustration is a neural circuit called the A) basal ganglia.
B) visual system.
C) limbic system.
D) reticular system.
E) none of the above
Answer: C
Diff: 1 Page Ref: 71
Topic: 3.6 Major Structures of the Brain
Type: (Factual)



122) The caudate, putamen, and globus pallidus compose the A) diencephalon.
B) limbic system.
C) somatosensory system.
D) basal ganglia.
E) thalamus.
Answer: D
Diff: 1 Page Ref: 71
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

123) Together, the caudate and the putamen compose the A) limbic system.
B) globus pallidus.
C) striatum.
D) amygdala.
E) uvula.
Answer: C
Diff: 3 Page Ref: 71
Topic: 3.6 Major Structures of the Brain
Type: (Factual)

124) Deterioration of the pathway from the substantia nigra to the striatum is often found in cases of A) Korsakoff's syndrome.
B) Parkinson's disease.
C) autism.
D) Alzheimer's disease.
E) multiple sclerosis.
Answer: B
Diff: 1 Page Ref: 71
Topic: 3.6 Major Structures of the Brain
Type: (Applied)

125) Illustrated here
A) is the limbic system.
B) is the diencephalon.
C) is the reticular formation.
D) are the basal ganglia.
E) is the medulla.
Answer: D
Diff: 1 Page Ref: 71
Topic: 3.6 Major Structures of the Brain
Type: (Factual)



FILL-IN-THE-BLANK QUESTIONS

1) The brain and spinal cord compose the ______ system. Answer: central nervous Diff: 1 Page Ref: 52 Topic: 3.1 General Layout of the Nervous System Type: Factual

2) The arachnoid membrane is one of the ______. Answer: meninges Diff: 1 Page Ref: 53 Topic: 3.1 General Layout of the Nervous System Type: Factual

3) Cerebrospinal fluid fills the four ______ of the brain. Answer: ventricles Diff: 1 Page Ref: 53 Topic: 3.1 General Layout of the Nervous System Type: Factual

4) Bundles of axons in the CNS are called ______. Answer: tracts Diff: 2 Page Ref: 56 Topic: 3.2 Cells of the Nervous System Type: Factual

5) At the junction of the cell body and axon of a multipolar neuron is the ______. Answer: axon hillock Diff: 1 Page Ref: 57 Topic: 3.2 Cells of the Nervous System Type: Factual

6) Large, star-shaped glial cells are _____. Answer: astrocytes Diff: 2 Page Ref: 57-59 Topic: 3.2 Cells of the Nervous System Type: Factual

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7) The ______ stain colors entirely black a few neurons in each brain slice. Answer: Golgi Diff: 2 Page Ref: 61 Topic: 3.3 Neuroanatomical Techniques and Directions

Type: Factual

8) The opposite of dorsal is ______. Answer: ventral Diff: 1 Page Ref: 62-63 Topic: 3.4 The Spinal Cord Type: Factual

9) It is ______ that gives white matter in the nervous system its glossy white sheen. Answer: myelin Diff: 1 Page Ref: 64 Topic: 3.4 The Spinal Cord Type: Factual

10) Sensory signals enter the spinal cord via the _____ roots. Answer: dorsal Diff: 2 Page Ref: 64 Topic: 3.4 The Spinal Cord Type: Factual

11) The bulge on the ventral surface of the metencephalon is the ______. Answer: pons Diff: 3 Page Ref: 65 Topic: 3.5 The Five Major Divisions of the Brain Type: Factual

12) The large, two-lobed subcortical structure that sits atop the brain stem is the ______. Answer: thalamus Diff: 2 Page Ref: 66 Topic: 3.5 The Five Major Divisions of the Brain Type: Factual

13) The ______ dangles from the hypothalamus. Answer: pituitary Diff: 2 Page Ref: 67 Topic: 3.5 The Five Major Divisions of the Brain Type: Factual

14) The cerebral hemispheres are connected by tracts called cerebral ______. Answer: commissures Diff: 1 Page Ref: 68 Topic: 3.5 The Five Major Divisions of the Brain Type: Factual

15) The temporal lobe is separated from the frontal lobe by the ______ fissure. *Answer: lateral*

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Diff: 2 Page Ref: 69 Topic: 3.5 The Five Major Divisions of the Brain Type: Factual

16) Pyramidal cells have ______ dendrites. Answer: apical Diff: 3 Page Ref: 69 Topic: 3.5 The Five Major Divisions of the Brain Type: Factual

17) The three-layered cortical structure of the medial temporal lobe is the ______.
Answer: hippocampus
Diff: 3 Page Ref: 70
Topic: 3.5 The Five Major Divisions of the Brain
Type: Factual

18) _____ means "ring." Answer: Limbic Diff: 2 Page Ref: 70 Topic: 3.5 The Five Major Divisions of the Brain Type: Factual

19) The almond-shaped nucleus of the anterior temporal lobe is the ______. Answer: amygdala Diff: 3 Page Ref: 70 Topic: 3.5 The Five Major Divisions of the Brain Type: Factual

20) The putamen and ______ compose the striatum. Answer: caudate Diff: 3 Page Ref: 71 Topic: 3.5 The Five Major Divisions of the Brain Type: Factual

ESSAY AND OTHER MULTIPLE-MARK QUESTIONS

Describe the overall layout of the divisions and systems of the mammalian nervous system. Include a table in your answer. (Hint: "The mammalian nervous system is a system of twos.")
 Answer:
 50% for a description of the organization
 50% for an accurate table
 Diff: 2 Page Ref: 52-53
 Topic: 3.1 General Layout of the Nervous System
 Type: (Factual)

2) Label and define each of the 9 identified parts of this typical multipolar neuron.



Answer: 9 marks for correct labels 9 marks for the definitions Diff: 2 Page Ref: 57 Topic: 3.2 Cells of the Nervous System *Type: (Factual)*

3) There are several kinds of glial cells in the nervous system. Describe them and their functions. How is our understanding of glial cells currently changing?

Answer: 50% for a description of glial cell types and their function 50% for discussing recently discovered functions of glial cells Diff: 3 Page Ref: 56-61 Topic: 3.2 Cells of the Nervous System Type: (Factual, Conceptual)

4) Compare Golgi and Nissl neuroanatomical stains, emphasizing the strengths and weaknesses of each. *Answer*:

25% for describing Golgi staining 25% for describing Nissl staining 50% for comparing the strengths and weaknesses of the two stains *Diff: 2 Page Ref: 61-62 Topic: 3.3 Neuroanatomical Techniques and Directions Type: (Factual)*

5) With the use of diagrams, describe all neuroanatomical directions in a conventional vertebrate (e.g., cat) nervous system and in the human nervous system.
Answer:
50% for illustrating dorsal, ventral, anterior, posterior, medial, and lateral in a cat
25% for illustrating how this system is adapted to humans
25% for illustrating superior, inferior, proximal, and distal
Diff: 3 Page Ref: 62-63
Topic: 3.3 Neuroanatomical Techniques and Directions
Type: (Factual)

6) Draw a lateral view of the human cerebral hemispheres. Illustrate the four lobes and label four other structures.

Answer: 40% for the drawing 40% for locating the four lobes 20% for labeling four structures Diff: 3 Page Ref: 68-69 Topic: 3.6 Major Structures of the Brain Type: (Factual)

7) Draw a midsagittal section of the human brain and label 10 structures.

Answer: 50% for the drawing 50% for correctly labeling 10 structures Diff: 3 Page Ref: 73 Topic: 3.6 Major Structures of the Brain Type: (Factual)

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Chapter 3: The Anatomy of the Nervous System

8) Label all 14 parts of this midsagittal view of a human brain.



Answer: 14 marks for correctly labeling 14 structures Diff: 2 Page Ref: 73 Topic: 3.6 Major Structures of the Brain Type: (Factual)

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