

CHAPTER 3

ANATOMY OF THE NERVOUS SYSTEM: SYSTEMS, STRUCTURES, AND CELLS THAT MAKE UP YOUR NERVOUS SYSTEM

MULTIPLE CHOICE QUESTIONS

1) The two major divisions of the nervous system are the

- A) ANS and the CNS.
- B) SNS and the CNS.
- C) PNS and the CNS.
- D) ANS and the PNS.
- E) brain and the spinal cord

Answer: C

Diff: 1 Page Ref: 52

Topic: 3.1 General Layout of the Nervous System

Type: (Factual)

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

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)

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.

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.

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) magnolia.
- 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)

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)

- 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

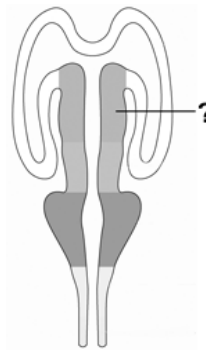
Diff: 2 Page Ref: 65

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 not 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

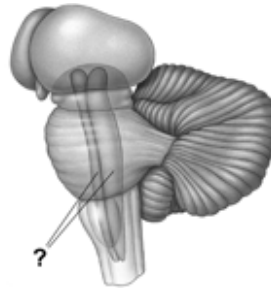
- A) cerebellum.
- B) hypothalamus.
- C) reticular formation.
- D) hippocampus.
- E) tegmentum.

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)

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)

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.

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 the

- A) basal ganglia.
- 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 **not** 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

- 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

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

1) 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

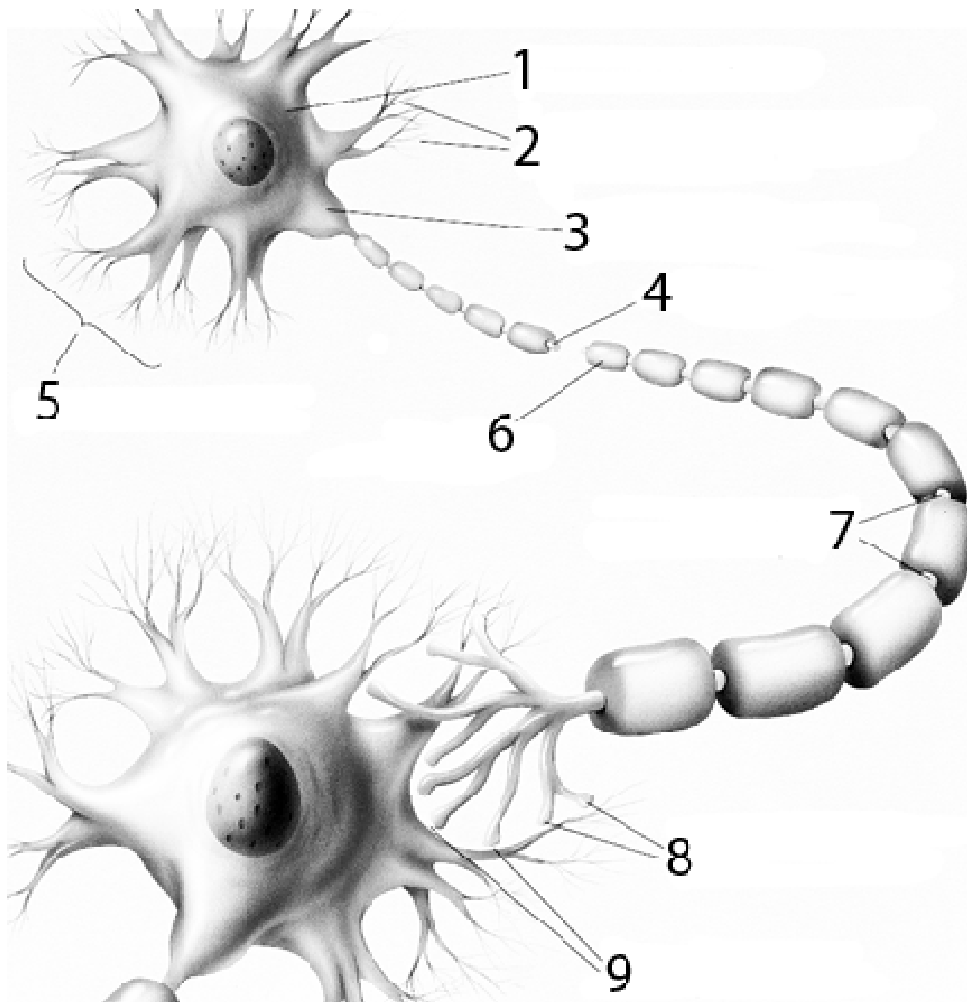
50% for an accurate table

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

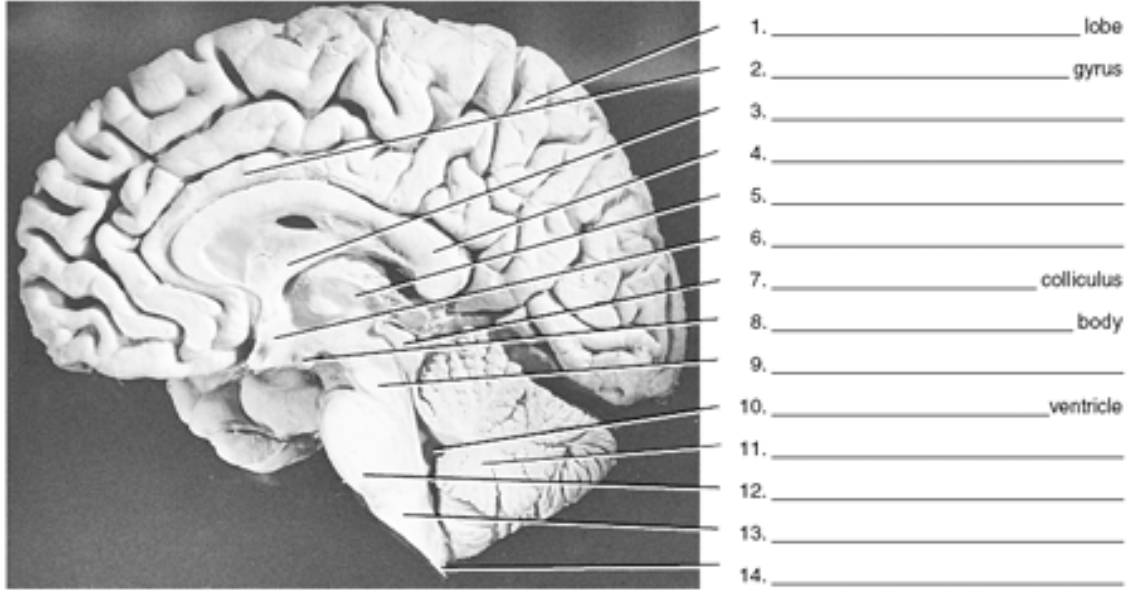
50% for correctly labeling 10 structures

Diff: 3 Page Ref: 73

Topic: 3.6 Major Structures of the Brain

Type: (Factual)

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)