MULTIPLE CHOICE

1. Structures located relatively toward the tail of a four-legged animal are referred to as
   a. rostral.
   b. caudal.
   c. dorsal.
   d. ventral.

   ANS: B PTS: 1 DIF: 2 REF: Page 27
   OBJ: 2.1 KEY: Factual

2. Structures located relatively toward the belly of a four-legged animal are referred to as
   a. rostral.
   b. caudal.
   c. dorsal.
   d. ventral.

   ANS: D PTS: 1 DIF: 2 REF: Page 27
   OBJ: 2.1 KEY: Factual

3. A dog's ears are _____ relative to its tail.
   a. rostral
   b. caudal
   c. dorsal
   d. ventral

   ANS: A PTS: 1 DIF: 2 REF: Page 27
   OBJ: 2.1 KEY: Factual

4. Which of the following pairs of terms mean the same thing?
   a. ventral—superior
   b. dorsal—inferior
   c. rostral—anterior
   d. caudal—ipsilateral

   ANS: C PTS: 1 DIF: 2 REF: Page 27
   OBJ: 2.1 KEY: Factual

5. An imaginary line that runs the length of the spinal cord to the front of the brain is known as the
   a. midline.
   b. proximal.
   c. neuraxis.
   d. plane of section.

   ANS: C PTS: 1 DIF: 2 REF: Page 27
   OBJ: 2.1 KEY: Factual

6. A person's hand is _____ relative to his or her elbow.
   a. proximal
   b. distal
   c. contralateral
   d. ipsilateral

   ANS: B PTS: 1 DIF: 2 REF: Page 28
   OBJ: 2.1 KEY: Factual

7. Two structures on opposite sides of the midline are referred to as
   a. proximal.
   b. distal.
   c. ipsilateral.
   d. contralateral.

ANS: D PTS: 1 DIF: 2 REF: Page 28
OBJ: 2.1 KEY: Factual

8. Your right arm is _____ to your right leg.
   a. proximal
   b. distal
   c. contralateral
   d. ipsilateral

   ANS: D PTS: 1 DIF: 2 REF: Page 28
   OBJ: 2.1 KEY: Factual MSC: New

9. The nerve fibers that originate in the cerebral cortex and control movement cross the midline just above the junction of the medulla and spinal cord. As a result, these fibers provide input to _____ structures of the body, or structures that are on the _____ side of the midline as the cortical cells providing their motor input.
   a. ipsilateral; same
   b. contralateral; opposite
   c. ipsilateral; opposite
   d. contralateral; same

   ANS: B PTS: 1 DIF: 3 REF: Page 28
   OBJ: 2.1 KEY: Factual MSC: New

10. The neuraxis runs in a straight line
    a. parallel to the ground in four-legged animals and humans.
    b. perpendicular to the ground in four-legged animals and humans.
    c. parallel to the ground in four-legged animals but makes a 90 degree turn in the brains of humans.
    d. parallel to the ground in humans but makes a 90 degree turn in the brains of four-legged animals.

    ANS: C PTS: 1 DIF: 2 REF: Page 28
    OBJ: 2.1 KEY: Factual MSC: New

11. Researchers investigating appetite distinguish between the roles played by the ventromedial hypothalamus and the lateral hypothalamus. Where are these two structures located relative to one another?
    a. The lateral hypothalamus is contralateral to the ventromedial hypothalamus.
    b. The lateral hypothalamus is rostral to the ventromedial hypothalamus.
    c. The lateral hypothalamus is closer to the midline than the ventromedial hypothalamus.
    d. The ventromedial hypothalamus is located closer to the midline than the lateral hypothalamus.

    ANS: D PTS: 1 DIF: 1 REF: Page 28
    OBJ: 2.1 KEY: Application MSC: New

12. The superior and inferior colliculi are located in the midbrain. Where are these two structures located relative to one another?
    a. The superior colliculi are located above the inferior colliculi.
    b. The superior colliculi are located below the inferior colliculi.
    c. The superior colliculi are closer to the midline than the inferior colliculi.
    d. The superior colliculi are farther away from the midline than the inferior colliculi.

ANS: A PTS: 1 DIF: 1 REF: Page 28
OBJ: 2.1 KEY: Application MSC: New

13. The anterior cingulate cortex (ACC) is located _____ the posterior cingulate cortex (PCC).
    a. behind
    b. in front of
    c. below
    d. above

ANS: B PTS: 1 DIF: 1 REF: Page 28
OBJ: 2.1 KEY: Application MSC: New

14. Most of the neural input to your left eyebrow originates in the motor cortex of the left hemisphere. In other words, your eyebrow receives input from the _____ hemisphere.
    a. proximal
    b. distal
    c. contralateral
    d. ipsilateral

ANS: D PTS: 1 DIF: 2 REF: Page 28
OBJ: 2.1 KEY: Application MSC: New

15. Planes of section that divide the brain parallel to the midline are known as _____ sections.
    a. sagittal
    b. coronal
    c. horizontal
    d. axial

ANS: A PTS: 1 DIF: 1 REF: Page 28
OBJ: 2.1 KEY: Factual

16. Researchers who wished to view a structure from the top of the head would use a _____ section.
    a. sagittal
    b. coronal
    c. horizontal
    d. midsagittal

ANS: C PTS: 1 DIF: 2 REF: Page 28
OBJ: 2.1 KEY: Factual

17. Early computerized tomography (CT) equipment could take images from only one perspective, the axial or horizontal section. This means that the resulting images were from sections that are _____ to the ground, dividing the brain from _____ .
    a. perpendicular; front to back
    b. perpendicular to the ground, dividing the brain from side to side.
    c. parallel to the midline, dividing the brain from side to side.
    d. parallel to the ground, dividing the brain from top to bottom.

ANS: D PTS: 1 DIF: 2 REF: Page 28
OBJ: 2.1 KEY: Factual MSC: New

18. In order to assess the size of the lateral ventricles in patients with schizophrenia, Dr. Weinberger has decided to use a coronal or frontal section. In other words, he is looking at a plane of section that is
    a. perpendicular to the ground, dividing the brain from front to back.
    b. perpendicular to the ground, dividing the brain from side to side.

c. parallel to the midline, dividing the brain from side to side.
d. parallel to the ground, dividing the brain from top to bottom.

ANS: A PTS: 1 DIF: 2 REF: Page 28
OBJ: 2.1 KEY: Factual MSC: New

19. The correct ordering of the layers of the meninges from the skull to the brain is:
a. pia mater, arachnoid layer, dura mater.
b. arachnoid layer, pia mater, dura mater.
c. dura mater, pia mater, arachnoid layer.
d. dura mater, arachnoid layer, pia mater.

ANS: D PTS: 1 DIF: 1 REF: Page 28
OBJ: 2.1 KEY: Factual

20. You just heard about a friend who has a tumor on the meninges of her right temporal lobe. This means that the tumor is _____ to the midline of the brain.
a. contralateral
b. medial
c. ventral
d. lateral

ANS: D PTS: 1 DIF: 1 REF: Page 28
OBJ: 2.1 KEY: Application

21. Given the fact that the motor cortex controls movement of contralateral body parts, if your grandfather experiences damage to his right hemisphere motor cortex due to a stroke, it is likely that he will
a. not be able to walk at all because he will be paralyzed from the waist down.
b. have some paralysis in the left side of his body.
c. not be able to understand anything you say to him.
d. have some paralysis on the right side of his body.

ANS: B PTS: 1 DIF: 2 REF: Page 28
OBJ: 2.1 KEY: Conceptual

22. Your cat always walks up to you and wants you to pet it on its _____ surface, but your dog lies on its back and presents its _____ surface for you to scratch.
a. ventral; dorsal
b. dorsal; ventral
c. rostral; caudal
d. caudal; rostral

ANS: B PTS: 1 DIF: 2 REF: Page 28
OBJ: 2.1 KEY: Conceptual

23. A subdural hematoma is a “bruise” that often occurs following a head injury. Given your knowledge of anatomical terms, which of the following is the likely location of this type of injury?
a. the scalp
b. the meninges
c. the lateral ventricles
d. the central canal of the spinal cord

ANS: B PTS: 1 DIF: 2 REF: Page 29
OBJ: 2.2 KEY: Conceptual MSC: New

24. Which of the meninges is described as a leatherlike tissue that follows the contours of the skull bones?
    a. pia mater
    b. dura mater
    c. arachnoid layer
    d. subarachnoid space

    ANS: B PTS: 1 DIF: 2 REF: Page 29
    OBJ: 2.2 KEY: Factual

25. Which layers of the meninges are found in the peripheral nervous system?
    a. pia mater, arachnoid layer, and dura mater
    b. pia mater only
    c. pia mater and dura mater only
    d. arachnoid layer and dura mater only

    ANS: C PTS: 1 DIF: 2 REF: Page 30
    OBJ: 2.2 KEY: Factual

26. The subarachnoid space is found between the arachnoid layer and the
    a. pia mater.
    b. dura mater.
    c. skull bones.
    d. lateral ventricles.

    ANS: A PTS: 1 DIF: 2 REF: Page 30
    OBJ: 2.2 KEY: Factual

27. Cerebrospinal fluid (CSF) is produced by the
    a. meninges.
    b. subarachnoid space.
    c. choroid plexus.
    d. ventricles.

    ANS: C PTS: 1 DIF: 2 REF: Page 30
    OBJ: 2.2 KEY: Factual

28. Cerebrospinal fluid (CSF) may be found in the
    a. central and peripheral nervous systems.
    b. peripheral nervous system only.
    c. lateral ventricles only.
    d. ventricles, subarachnoid space, and central canal of the spinal cord.

    ANS: D PTS: 1 DIF: 2 REF: Page 30
    OBJ: 2.2 KEY: Factual

29. The primary purpose of cerebrospinal fluid (CSF) is to
    a. nourish the cells of the brain.
    b. cushion or “float” the weight of the brain.
    c. remove toxins from the brain.
    d. provide circulation for chemical messengers.

    ANS: B PTS: 1 DIF: 2 REF: Page 30
    OBJ: 2.2 KEY: Factual

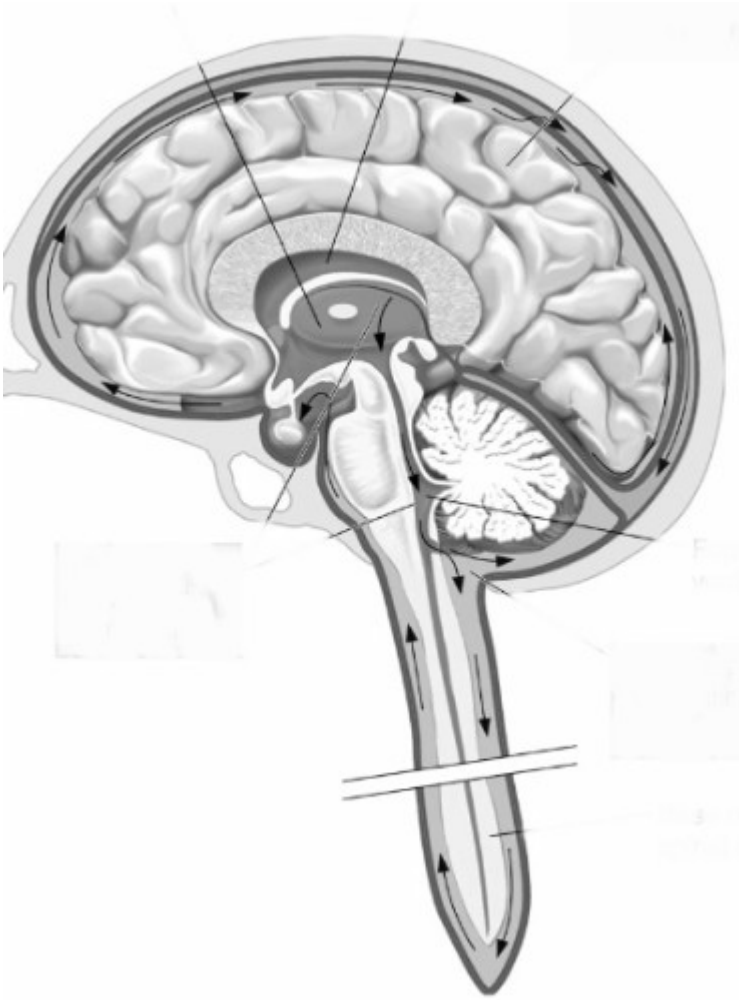
30. A friend calls and says his child has just come down with a fever. When the child bends her head forward she screams in pain. The parent asks you what to do. Given what you have read in this chapter, what would you suggest?

a. Have the child lie down; she'll probably be fine.
b. Call the pediatrician in the morning.
c. Get the child immediately to the nearest hospital, as the symptoms sound very much like meningitis. You may be wrong, but it's not worth taking the chance.
d. The child probably has a brain tumor and should see a neurologist.

ANS: C PTS: 1 DIF: 1 REF: Page 30
OBJ: 2.2 KEY: Application

31. The blood supply to the brain is provided by the
a. carotid and vertebral arteries.
b. subclavian and axillary arteries.
c. celiac artery.
d. aorta.

ANS: A PTS: 1 DIF: 2 REF: Page 31
OBJ: 2.2 KEY: Factual



32. This figure illustrates the circulation of
a. blood through the brain and spinal cord.
b. cerebrospinal fluid between the meninges and the upper layer of cortex.
c. cerebrospinal fluid through the ventricles, the central canal of the spinal cord, and in the subarachnoid space.
d. cerebrospinal fluid, from its manufacture in the subarachnoid space into the ventricles and central canal of the spinal cord.

ANS: C
(See Figure 2.5b)

PTS: 1 DIF: 2 REF: Page 31 OBJ: 2.2
KEY: Factual MSC: New

33. A condition that results when the circulation of cerebrospinal fluid (CSF) is blocked is known as
    a. hydrocephalus.
    b. meningioma.
    c. meningitis.
    d. septicemia.

ANS: A PTS: 1 DIF: 1 REF: Page 31
OBJ: 2.2 KEY: Factual

34. If you go to the doctor with a fever, horrible headache, and a stiff neck, why might the doctor suggest a spinal tap?
    a. A spinal tap will tell if you have a brain tumor.
    b. The cerebrospinal fluid (CSF) may tell the doctor if there is any evidence of meningitis or encephalitis.
    c. The cerebrospinal fluid (CSF) is the same as the blood supply, and the doctor can tell if you have an infection.
    d. The cerebrospinal fluid (CSF) is the only way the doctor can tell if you are on drugs.

ANS: B PTS: 1 DIF: 2 REF: Page 31
OBJ: 2.2 KEY: Application

35. Why would your doctor want to do a spinal tap if she suspected that you had an infection of the brain?
    a. Because the cerebrospinal fluid (CSF) of the spinal cord is continuous with the cerebrospinal fluid (CSF) of the brain.
    b. Because the spinal cord is part of the central nervous system.
    c. Because the peripheral and central nervous systems are connected.
    d. She wouldn't do a spinal tap because the spinal cord is made of different kinds of neurons than the brain.

ANS: A PTS: 1 DIF: 2 REF: Page 31
OBJ: 2.2 KEY: Conceptual

36. Which of the following is found in the peripheral nervous system?
    a. the corpus callosum
    b. the red nucleus
    c. the sympathetic nervous system
    d. the central canal

ANS: C PTS: 1 DIF: 2 REF: Page 33
OBJ: 2.2 KEY: Factual MSC: New

37. Which of the following statements is correct?
    a. The central nervous system is encased in bone, but has no cerebrospinal fluid.
    b. The peripheral nervous system is encased in bone, but has no cerebrospinal fluid.
    c. The peripheral nervous system is encased with bone and is bathed with

cerebrospinal fluid.
d. The central nervous system is encased with bone and is bathed with cerebrospinal fluid.

ANS: D PTS: 1 DIF: 2 REF: Page 33
OBJ: 2.2 KEY: Factual MSC: New

38. The spinal cord extends _____ of the vertebral column.
a. down the entire length
b. down about two-thirds the length
c. about halfway down the length
d. about a third of the way down the length

ANS: B PTS: 1 DIF: 3 REF: Page 33
OBJ: 2.3 KEY: Factual

39. Running down the center of the spinal cord is the
a. subarachnoid space.
b. fourth ventricle.
c. central canal.
d. spinal ventricle.

ANS: C PTS: 1 DIF: 2 REF: Page 33
OBJ: 2.3 KEY: Factual

40. The region consisting of the head, neck, and arms is served by nerves exiting the _____ division of the spinal cord.
a. sacral
b. lumbar
c. thoracic
d. cervical

ANS: D PTS: 1 DIF: 1 REF: Page 34
OBJ: 2.3 KEY: Factual

41. The correct order of the spinal divisions from rostral to caudal is:
a. cervical, thoracic, lumbar, sacral, coccygeal.
b. cervical, lumbar, thoracic, sacral, coccygeal.
c. thoracic, cervical, lumbar, sacral, coccygeal.
d. cervical, thoracic, lumbar, coccygeal, sacral.

ANS: A PTS: 1 DIF: 2 REF: Page 34
OBJ: 2.3 KEY: Factual

42. A thoracic surgeon operates in the vicinity of the thoracic division of the spinal cord; that is, the structures located in the
a. neck
b. torso
c. lower back
d. genitals and legs

ANS: B PTS: 1 DIF: 2 REF: Page 34
OBJ: 2.3 KEY: Factual MSC: New

43. As a result of an accident that occurred while playing football, Michael must wear a device known as a cervical collar until his injuries heal. Based on this information, we know that Michael injured his
a. shoulder
c. neck

b. knee
d. lower back

ANS: C PTS: 1 DIF: 2 REF: Page 34
OBJ: 2.3 KEY: Application MSC: New

44. Julie's physician tells her that she damaged a disk in the lumbar region of her spinal cord. It is likely that Julie sought medical advice due to pain she experienced in her
a. neck
c. shoulder
b. upper back
d. lower back

ANS: D PTS: 1 DIF: 2 REF: Page 34
OBJ: 2.3 KEY: Application MSC: New

45. Spinal neurons that pass motor information to the body's muscles may be found in _____ of the spinal cord.
a. the white matter
c. the ventral horns
b. the dorsal horns
d. both the dorsal and ventral horns

ANS: C PTS: 1 DIF: 3 REF: Page 34
OBJ: 2.3 KEY: Factual

46. Axons carrying sensory information to the brain may be found in
a. the ventral white matter of the spinal cord.
b. the dorsal white matter of the spinal cord.
c. both the ventral and dorsal white matter of the spinal cord.
d. the lateral white matter of the spinal cord only.

ANS: B PTS: 1 DIF: 2 REF: Page 34
OBJ: 2.3 KEY: Factual

47. The knee jerk reflex, in which your foot kicks in response to a tap on your knee, is also known as a _____ reflex.
a. withdrawal
c. patellar
b. postural
d. polysynaptic

ANS: C PTS: 1 DIF: 1 REF: Page 34
OBJ: 2.3 KEY: Factual

48. You've just heard that someone's spinal cord has been injured at L2 (lumbar nerve 2). Given what you've learned in this chapter, which of the following will likely be true?
a. The person will be totally paralyzed from the neck down.
b. The person will be totally paralyzed from just below the arms.
c. Depending on how severe the injury, the person may be unable to move or feel anything from around the waist down.
d. Depending on how severe the injury, the person may be unable to move or feel anything from around the chest down.

ANS: C PTS: 1 DIF: 3 REF: Page 34
OBJ: 2.3 KEY: Application

49. A person with cervical spinal cord damage is known as a _____ and experiences loss of sensation and motor control in the _____.

a. paraplegic; arms and legs
b. paraplegic; legs only
c. quadriplegic; arms and legs
d. quadriplegic; legs only

ANS: C PTS: 1 DIF: 2 REF: Page 35
OBJ: 2.3 KEY: Conceptual

50. The myelencephalon and metencephalon are located in the
a. hindbrain.
b. midbrain.
c. forebrain.
d. cerebellum.

ANS: A PTS: 1 DIF: 2 REF: Page 35
OBJ: 2.4 KEY: Factual MSC: New

51. Another name for the midbrain is the
a. myelencephalon.
b. metencephalon.
c. mesencephalon.
d. diencephalon.

ANS: C PTS: 1 DIF: 2 REF: Page 35
OBJ: 2.4 KEY: Factual MSC: New

52. The brainstem contains the
a. hindbrain only.
b. midbrain only.
c. hindbrain and midbrain.
d. hindbrain, midbrain, and forebrain.

ANS: C PTS: 1 DIF: 1 REF: Page 35
OBJ: 2.4 KEY: Factual

53. The structure located just rostral to the junction between the spinal cord and the brain is the
a. medulla.
b. cerebellum.
c. pons.
d. reticular formation.

ANS: A PTS: 1 DIF: 2 REF: Page 35
OBJ: 2.4 KEY: Factual

54. Jonathan has been diagnosed with a tumor located in his medulla. His physician warns him that until treated, the tumor will most directly affect his
a. balance and motor coordination.
b. breathing, heart rate, and blood pressure.
c. control of aggression.
d. decision-making.

ANS: B PTS: 1 DIF: 2 REF: Page 35
OBJ: 2.4 KEY: Application MSC: New

55. The pons and cerebellum make up which of the following divisions?
a. telecephalon
b. diencephalon
c. mesencephalon
d. metencephalon

ANS: D PTS: 1 DIF: 2 REF: Page 35
OBJ: 2.4 KEY: Factual MSC: New

56. The brainstem contains which of the following structures?

a. the central sulcus
b. the corpus callosum
c. the medulla
d. the hypothalamus

ANS: C PTS: 1 DIF: 1 REF: Page 35
OBJ: 2.4 KEY: Factual

57. The medulla contains nuclei responsible for which of the following functions?
a. balance and motor coordination
b. heart rate and respiration
c. visual reflexes
d. auditory reflexes

ANS: B PTS: 1 DIF: 2 REF: Page 35
OBJ: 2.4 KEY: Factual

58. The cochlear and vestibular nuclei are located in the
a. midbrain.
b. medulla.
c. pons.
d. cerebellum.

ANS: C PTS: 1 DIF: 2 REF: Page 35
OBJ: 2.4 KEY: Factual

59. Lucy is experiencing problems with dizziness and maintaining her balance. Her physician is likely to look for the source of her problems in the
a. vestibular system and the cerebellum.
b. reticular formation.
c. red nucleus and the cerebellum.
d. cochlear nucleus and the inferior colliculi.

ANS: A PTS: 1 DIF: 2 REF: Page 35
OBJ: 2.4 KEY: Application MSC: New

60. The reticular formation is involved with regulation of
a. appetite.
b. heart rate and respiration.
c. sexual activity.
d. sleep and arousal.

ANS: D PTS: 1 DIF: 2 REF: Page 35
OBJ: 2.4 KEY: Factual

61. The reticular formation is located in the
a. medulla.
b. medulla and pons.
c. pons.
d. medulla, pons, and midbrain.

ANS: D PTS: 1 DIF: 3 REF: Page 35
OBJ: 2.4 KEY: Factual

62. Your textbook tells you that the medulla, like the spinal cord, contains large quantities of white matter. This means that
a. the medulla contains large numbers of nuclei which control breathing and other vital functions that are mediated by the spinal cord.
b. many axons travel through the medulla, just like they do through the spinal cord.
c. there is a great deal of material in both the spinal cord and medulla, the functions of which we do not understand.
d. many reflexes are controlled by the medulla and the spinal cord.

ANS: B PTS: 1 DIF: 3 REF: Page 35
OBJ: 2.4 KEY: Application

63. The locus coeruleus is located in the
a. medulla.
b. pons.
c. midbrain.
d. cerebellum.

ANS: B PTS: 1 DIF: 2 REF: Page 36
OBJ: 2.4 KEY: Factual

64. Which of the following structures does **not** contain any parts of the reticular formation?
a. the midbrain
b. the diencephalon
c. the medulla
d. the hindbrain

ANS: B PTS: 1 DIF: 3 REF: Page 36
OBJ: 2.4 KEY: Factual

65. Which of the following structures are important to the regulation of mood, arousal, and sleep?
a. the vestibular nucleus and the cochlear nucleus
b. the raphe nuclei and the locus coeruleus
c. the red nucleus and substantia nigra
d. periaqueductal gray and the red nucleus

ANS: B PTS: 1 DIF: 2 REF: Page 36
OBJ: 2.4 KEY: Factual MSC: New

66. Alcohol interferes with skilled movements primarily through its action on the
a. reticular formation.
b. hypothalamus.
c. cerebellum.
d. medulla.

ANS: C PTS: 1 DIF: 1 REF: Page 37
OBJ: 2.4 KEY: Factual

67. Autism is frequently associated with abnormalities in the
a. cerebellum.
b. reticular formation.
c. medulla.
d. vestibular nuclei.

ANS: A PTS: 1 DIF: 2 REF: Page 37
OBJ: 2.4 KEY: Factual

68. Which of the following structures is found in humans, but not in other animals?
a. periaqueductal gray
b. the superior colliculi
c. the neodentate nucleus
d. the substantia nigra

ANS: C PTS: 1 DIF: 3 REF: Page 37
OBJ: 2.4 KEY: Factual MSC: New

69. Stanley is experiencing ongoing degeneration in his cerebellum. Consequently, which of the following behaviors may become progressively more difficult for him?
a. breathing

b. maintaining a normal core body temperature
c. sleeping
d. speaking clearly

ANS: D PTS: 1 DIF: 3 REF: Page 37
OBJ: 2.4 KEY: Application MSC: New

70. The dorsal portion of the midbrain is also known as the
a. tegmentum.
b. tectum.
c. cerebral aqueduct.
d. reticular formation.

ANS: B PTS: 1 DIF: 3 REF: Page 37
OBJ: 2.4 KEY: Factual

71. A pathway considered important to our experience of reward and pleasure originates in the ventral tegmentum. Where would we look to find this area?
a. in the spinal cord
b. in the hindbrain
c. in the midbrain
d. in the forebrain

ANS: C PTS: 1 DIF: 2 REF: Page 37
OBJ: 2.4 KEY: Factual MSC: New

72. The cerebral aqueduct links the
a. third and fourth ventricles.
b. two lateral ventricles.
c. fourth ventricle and the spinal canal.
d. fourth ventricle and the subarachnoid space.

ANS: A PTS: 1 DIF: 2 REF: Page 37
OBJ: 2.4 KEY: Factual

73. Which of the following structures participates in our experience of pain?
a. the red nucleus
b. the substantia nigra
c. periaqueductal gray
d. the superior colliculi

ANS: C PTS: 1 DIF: 3 REF: Page 37
OBJ: 2.4 KEY: Factual

74. Our enjoyment of a good surround sound system, which makes it seem like sounds are coming from different directions in our environment, depends on our
a. superior colliculi.
b. inferior colliculi.
c. periaqueductal gray.
d. substantia nigra.

ANS: B PTS: 1 DIF: 2 REF: Page 38
OBJ: 2.4 KEY: Application MSC: New

75. The basal ganglia, substantia nigra, and red nucleus are important for which of the following functions?
a. memory
b. motor control
c. sympathetic nervous system control
d. emotion

ANS: B PTS: 1 DIF: 3 REF: Page 38

OBJ: 2.4 KEY: Factual

76. Several visual reflexes are managed by the
a. red nucleus.
b. periaqueductal gray.
c. superior colliculi.
d. inferior colliculi.

ANS: C PTS: 1 DIF: 2 REF: Page 38
OBJ: 2.4 KEY: Factual

77. The diencephalon contains which of the following structures?
a. the thalamus and hypothalamus
b. the thalamus and the basal ganglia
c. the inferior and superior colliculi
d. the substantia nigra and the basal ganglia

ANS: A PTS: 1 DIF: 1 REF: Page 38
OBJ: 2.4 KEY: Factual

78. Before proceeding to the cerebral cortex, input from most sensory systems converges on the
a. hypothalamus.
b. thalamus.
c. amygdala.
d. hippocampus.

ANS: B PTS: 1 DIF: 2 REF: Page 38
OBJ: 2.4 KEY: Factual

79. Katie has a tumor that is disrupting her ability to maintain her body temperature. Near which of the following structures is Katie's tumor most likely to be located?
a. hypothalamus
b. periaqueductal gray
c. locus coeruleus
d. raphe nuclei

ANS: A PTS: 1 DIF: 2 REF: Page 39
OBJ: 2.4 KEY: Application MSC: New

80. Major regulatory functions, including hunger, thirst, sex, and temperature control, are managed primarily by the
a. hypothalamus.
b. thalamus.
c. amygdala.
d. hippocampus.

ANS: A PTS: 1 DIF: 2 REF: Page 39
OBJ: 2.4 KEY: Factual

81. The release of hormones by the pituitary gland is regulated primarily by the
a. hypothalamus.
b. thalamus.
c. amygdala.
d. hippocampus.

ANS: A PTS: 1 DIF: 2 REF: Page 39
OBJ: 2.4 KEY: Factual

82. The caudate nucleus, globus pallidus, putamen, and subthalamic nucleus make up the
a. hypothalamus.
b. reticular formation.
c. basal ganglia.
d. limbic system.

ANS: C PTS: 1 DIF: 2 REF: Page 39
OBJ: 2.4 KEY: Factual

83. The subthalamic nucleus is part of the
a. diencephalon.
b. reticular formation.
c. basal ganglia.
d. limbic system.

ANS: C PTS: 1 DIF: 2 REF: Page 39
OBJ: 2.4 KEY: Factual MSC: New

84. Anatomists often group the nucleus accumbens, which participates in our sense of pleasure and reward, with the
a. reticular formation.
b. vestibular system.
c. cranial nerve nuclei.
d. basal ganglia.

ANS: D PTS: 1 DIF: 2 REF: Page 39
OBJ: 2.4 KEY: Factual

85. Some anatomists group the _____ with the basal ganglia.
a. thalamus and the hypothalamus
b. hippocampus and the amygdala
c. reticular formation and the substantia nigra
d. amygdala and the substantia nigra

ANS: D PTS: 1 DIF: 2 REF: Page 39
OBJ: 2.4 KEY: Factual

86. Degeneration of the basal ganglia is a feature of which of the following conditions?
a. Alzheimer's disease
b. Parkinson's disease
c. schizophrenia
d. autism

ANS: B PTS: 1 DIF: 2 REF: Page 39
OBJ: 2.4 KEY: Factual

87. The structures of the limbic system are particularly important in
a. emotion and learning.
b. sensation.
c. motor control.
d. regulation of hunger and thirst.

ANS: A PTS: 1 DIF: 1 REF: Page 40
OBJ: 2.4 KEY: Factual

88. The hippocampus is important in which of the following functions?
a. learning and memory
b. motor control
c. recognition of biological danger
d. regulation of hunger and thirst

ANS: A PTS: 1 DIF: 2 REF: Page 40
OBJ: 2.4 KEY: Factual

89. Stephen’s surgery for epilepsy has made it very difficult for him to learn the names of new people he meets. It is most likely that Stephen’s surgery affected his
a. hippocampus in both of his temporal lobes.
b. locus coeruleus.

c. hypothalamus.
d. nucleus accumbens.

ANS: A PTS: 1 DIF: 2 REF: Page 40
OBJ: 2.4 KEY: Application MSC: New

90. Damage to the hippocampus in both cerebral hemispheres is associated with
a. Parkinson's disease.
b. schizophrenia.
c. retrograde amnesia.
d. anterograde amnesia.

ANS: D PTS: 1 DIF: 2 REF: Page 40
OBJ: 2.4 KEY: Factual

91. The amygdala participates in which of the following behaviors?
a. learning and memory
b. motor control
c. fear and aggression
d. regulation of hunger and thirst

ANS: C PTS: 1 DIF: 2 REF: Page 40
OBJ: 2.4 KEY: Factual

92. Students in a biological psychology laboratory were investigating the ability of rats to form associations between tones and electrical shock. Lesions to which of the following structures would make it very difficult for the students to teach their rats to be afraid of the tones?
a. the nucleus accumbens
b. the amydala
c. the substantia nigra
d. the hypothalmus

ANS: B PTS: 1 DIF: 2 REF: Page 40
OBJ: 2.4 KEY: Application MSC: New

93. Which of the following structures is **not** included in the limbic system?
a. the hypothalamus
b. the thalamus
c. the cingulate cortex
d. the amygdala

ANS: B PTS: 1 DIF: 2 REF: Page 40
OBJ: 2.4 KEY: Factual

94. Cindy brought a fake rubber snake into the lab where her rhesus monkeys lived. Most of the monkeys responded with fear vocalizations, but one did not. Cindy knew this monkey had been in a lesion experiment prior to coming to her lab, but she didn't know what type of lesion had been done. What would you tell Cindy about her monkey?
a. He probably didn't have a lesion at all, as ignoring fake snakes is considered normal for rhesus monkeys.
b. He probably had a lesion in the hippocampus of both hemispheres.
c. He probably had a lesion in the amygdala of both hemispheres.
d. He probably had a lesion of the ventromedial nucleus of the hypothalamus.

ANS: C PTS: 1 DIF: 2 REF: Page 40
OBJ: 2.4 KEY: Application MSC: New

95. You have noticed that you sometimes have a “knee jerk” emotional reaction to particular things, even if you try to control your emotions. Given what you have learned so far, what might explain this?
    a. We can't control either emotional or physical reflexes.
    b. Emotion is primarily controlled by the limbic system, which does not include parts of the brain involved with logical thought.
    c. Emotion is primarily controlled by the basal ganglia, which do not communicate with the cerebral cortex.
    d. There is no need to explain this situation. Anyone can control emotional feelings with effort.

    ANS: B PTS: 1 DIF: 2 REF: Page 40
    OBJ: 2.4 KEY: Conceptual

96. Lesions of the _____ usually produce rage and attack behaviors.
    a. hippocampus
    b. amygdala
    c. septal area
    d. thalamus

    ANS: C PTS: 1 DIF: 2 REF: Page 41
    OBJ: 2.4 KEY: Factual

97. The olfactory bulbs participate in the processing of which sensory modality?
    a. vision
    b. touch
    c. audition
    d. smell

    ANS: D PTS: 1 DIF: 1 REF: Page 41
    OBJ: 2.4 KEY: Factual

98. Von Economo neurons are found in the
    a. hippocampus of all mammals.
    b. hippocampus of great apes and humans.
    c. cingulate cortex of all mammals.
    d. cingulate cortex of great apes and humans.

    ANS: D PTS: 1 DIF: 2 REF: Page 41
    OBJ: 2.4 KEY: Factual MSC: New

99. Jessica was playing poker while on a vacation in Las Vegas, and in a fit of exuberance, bet all of her money on one hand. Unfortunately, it turned out to be a losing hand. If we were using functional magnetic resonance imaging (fMRI) to observe Jessica’s reactions to losing, which structure might have shown especially increased activation?
    a. her anterior cingulate cortex
    b. her posterior cingulate cortex
    c. her amygdala
    d. her hippocampus

    ANS: A PTS: 1 DIF: 3 REF: Page 41
    OBJ: 2.4 KEY: Application MSC: New

100. Paul just found out that all of his friends in the dorm went to a party without him. Which of the following structures in Paul’s brain would we expect to be especially activated by this social rejection?
    a. the amygdala
    c. the anterior cingulate cortex

b. the hippocampus
d. the posterior cingulate cortex

ANS: C PTS: 1 DIF: 3 REF: Page 41
OBJ: 2.4 KEY: Application MSC: New

101. The “bumps” or ridges of the cerebral cortex are known as
a. gyri.
b. sulci.
c. fissures.
d. ganglia.

ANS: A PTS: 1 DIF: 2 REF: Page 42
OBJ: 2.5 KEY: Factual

102. Korbinian Brodmann’s system for dividing the cerebral cortex into 52 areas is based on
a. divisions of the surface by sulci and fissures.
b. regular units covering one square inch.
c. the function of the underlying cortex of each area.
d. the distribution of cell bodies in the six layers of cortex.

ANS: D PTS: 1 DIF: 3 REF: Page 42
OBJ: 2.5 KEY: Factual MSC: New

103. The “valleys” or depressions between ridges of cerebral cortex are known as
a. gyri.
b. sulci.
c. nuclei.
d. ganglia.

ANS: B PTS: 1 DIF: 1 REF: Page 42
OBJ: 2.5 KEY: Factual

104. A particularly large sulcus is known as a
a. gyrus.
b. fasciculus.
c. fissure.
d. lemniscus.

ANS: C PTS: 1 DIF: 2 REF: Page 42
OBJ: 2.5 KEY: Factual

105. The degree of cortical convolution in the brain predicts a species'
a. intelligence.
b. physical size.
c. identity as an herbivore, a carnivore, or an omnivore.
d. identity as nocturnal or diurnal.

ANS: A PTS: 1 DIF: 1 REF: Page 42
OBJ: 2.5 KEY: Factual

106. How many distinct layers are typically found in the cerebral cortex?
a. two
b. four
c. six
d. eight

ANS: C PTS: 1 DIF: 3 REF: Page 42
OBJ: 2.5 KEY: Factual

107. Which of the cortical layers contains no cell bodies?

a. layer I
b. layers II and IV
c. layers III and V
d. layer VI

ANS: A PTS: 1 DIF: 3 REF: Page 42
OBJ: 2.5 KEY: Factual

108. Granule cells are usually found in cortical
a. layer I.
b. layers II and IV.
c. layers III and V.
d. layer VI.

ANS: B PTS: 1 DIF: 2 REF: Page 42
OBJ: 2.5 KEY: Factual

109. Pyramidal cells are usually found in cortical
a. layer I.
b. layers II and IV.
c. layers III and V.
d. layer VI.

ANS: C PTS: 1 DIF: 2 REF: Page 42
OBJ: 2.5 KEY: Factual

110. Output from the cortex to other parts of the nervous system usually originates in which of the cortical layers?
a. II and IV
b. III and IV
c. II and II
d. V and VI

ANS: B PTS: 1 DIF: 2 REF: Page 42
OBJ: 2.5 KEY: Factual MSC: New

111. Although the human cerebral cortex performs many higher order cognitive functions,
a. its volume is similar to the cortex of cats and dogs.
b. its functions are quite different from the functions performed by the cortex of other mammals.
c. it makes up nearly the entire volume of the cerebral hemisphere.
d. it makes up only a thin layer of tissue covering the cerebral hemispheres.

ANS: D PTS: 1 DIF: 2 REF: Page 42
OBJ: 2.5 KEY: Conceptual

112. The caudal boundary of the frontal lobe is formed by the
a. longitudinal fissure.
b. lateral sulcus.
c. calcarine fissure.
d. central sulcus.

ANS: D PTS: 1 DIF: 2 REF: Page 43
OBJ: 2.5 KEY: Factual

113. The most rostral lobes of the cerebral cortex are the _____ lobes.
a. frontal
b. parietal
c. temporal
d. occipital

ANS: A PTS: 1 DIF: 1 REF: Page 43
OBJ: 2.5 KEY: Factual

114. The most caudal lobes of the cerebral cortex are the _____ lobes.
a. frontal
b. parietal
c. temporal
d. occipital

ANS: D PTS: 1 DIF: 1 REF: Page 43
OBJ: 2.5 KEY: Factual

115. Primary somatosensory cortex is located in the _____ lobes.
a. frontal
b. parietal
c. temporal
d. occipital

ANS: B PTS: 1 DIF: 3 REF: Page 43
OBJ: 2.6 KEY: Factual

116. The postcentral gyrus contains primary _____ cortex.
a. somatosensory
b. motor
c. auditory
d. visual

ANS: A PTS: 1 DIF: 1 REF: Page 43
OBJ: 2.6 KEY: Factual MSC: New

117. Primary visual cortex is located in the _____ lobes.
a. frontal
b. parietal
c. temporal
d. occipital

ANS: D PTS: 1 DIF: 2 REF: Page 43
OBJ: 2.6 KEY: Factual

118. Primary auditory cortex is located in the _____ lobes.
a. frontal
b. parietal
c. temporal
d. occipital

ANS: C PTS: 1 DIF: 2 REF: Page 43
OBJ: 2.6 KEY: Factual

119. Primary motor cortex is located in the _____ lobes.
a. frontal
b. parietal
c. temporal
d. occipital

ANS: A PTS: 1 DIF: 2 REF: Page 43
OBJ: 2.6 KEY: Factual

120. Following a serious head injury, Robert began to make a series of impulsive decisions that led to negative consequences, such as quitting his job and leaving his wife for a woman he met in a bar. It is most likely that Robert's injury affected his _____ lobes.
a. occipital
b. frontal
c. parietal
d. temporal

ANS: B PTS: 1 DIF: 2 REF: Page 43
OBJ: 2.5 KEY: Application MSC: New

121. Clare's head injury has left her with serious problems in planning and executive cognitive functions, such as being able to remember a new friend's telephone number long enough to put it in her cell phone. It is likely that Clare's injury damaged her
a. amygdala.
b. hippocampus.
c. dorsolateral prefrontal cortex.
d. posterior cingulate cortex.

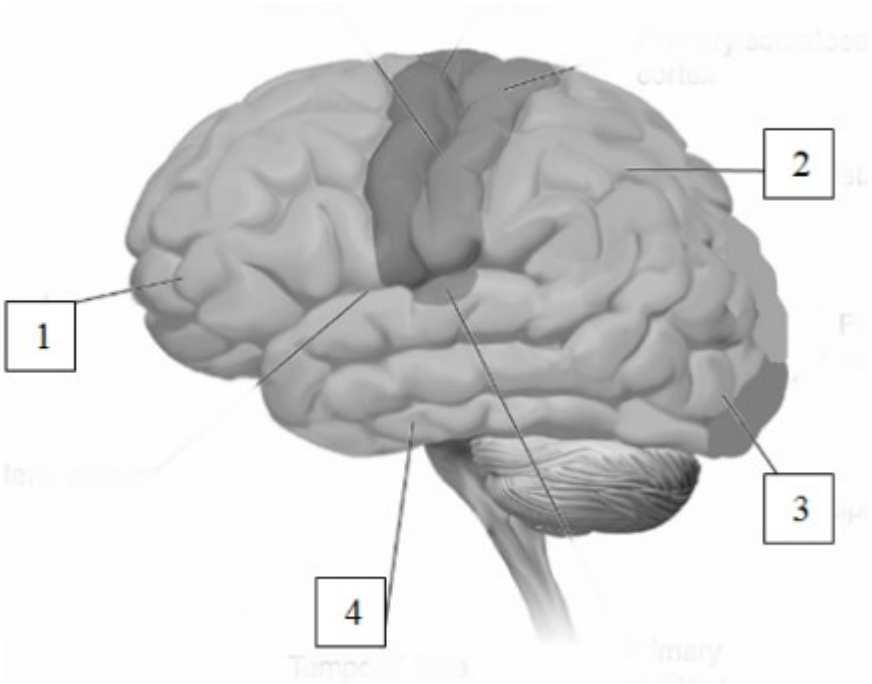
ANS: C PTS: 1 DIF: 3 REF: Page 44
OBJ: 2.5 KEY: Application MSC: New

122. Given what you know about the functions of the frontal lobes, which of the following are likely side effects of the ill-conceived frontal lobotomy procedure that was popular in the middle of the 20th century?
a. sleep disturbances
b. depression
c. obesity
d. impulsivity, personality change, and poor decision-making

ANS: D PTS: 1 DIF: 2 REF: Page 44
OBJ: 2.5 KEY: Application MSC: New

123. The two cerebral hemispheres are connected by the
a. anterior commissure and the corpus callosum.
b. anterior and medial commissures.
c. medial commissure and the corpus callosum.
d. arcuate fasciculus and the corpus callosum.

ANS: A PTS: 1 DIF: 1 REF: Page 44
OBJ: 2.5 KEY: Factual



124. Among the functions localized in the area designated "1" above are
a. decision-making and planning.

b. processing of sound and visual recognition of objects.
c. generating movement and perceiving body position.
d. primary visual processing and perception of movement.

ANS: A
(see Figure 2.19)

PTS: 1 DIF: 2 REF: Page 45 OBJ: 2.5
KEY: Factual MSC: New

125. A patient who becomes uncharacteristically impulsive and unable to maintain his or her typical attention span may have experienced damage to his or her _____ lobes.
a. frontal
b. parietal
c. temporal
d. occipital

ANS: A PTS: 1 DIF: 2 REF: Page 45
OBJ: 2.5 KEY: Application

126. Extreme antisocial behavior has been correlated with damage to the
a. hippocampus.
b. orbitofrontal cortex.
c. primary visual cortex.
d. corpus callosum.

ANS: B PTS: 1 DIF: 2 REF: Page 45
OBJ: 2.5 KEY: Factual

127. Your art teacher in high school was always telling the class that everyone could be an artist if they would just stop thinking with their left brain and let their right brain control their hands. Your teacher was wrong because
a. creativity is mediated by the right hemisphere.
b. artistic ability is mediated by the left hemisphere.
c. each hemisphere controls the contralateral hand, and the corpus callosum ensures continuous communication between the two hemispheres.
d. there is no difference between the two hemispheres of the brain.

ANS: C PTS: 1 DIF: 2 REF: Page 46
OBJ: 2.5 KEY: Conceptual

128. Damage to which of the following areas results in problems producing speech?
a. Broca's area
b. Wernicke's area
c. the orbitofrontal cortex
d. the cingulate cortex

ANS: A PTS: 1 DIF: 2 REF: Page 46
OBJ: 2.5 KEY: Factual

129. For the vast majority of the population, which of the following functions are localized to the left hemisphere?
a. language
b. spatial abilities
c. intuition
d. artistic and musical abilities

ANS: A PTS: 1 DIF: 2 REF: Page 46
OBJ: 2.5 KEY: Factual

130. Which of the following peripheral nerves enter and exit the brain itself?
a. cervical
b. thoracic
c. cranial
d. lumbar

ANS: C PTS: 1 DIF: 1 REF: Page 47
OBJ: 2.7 KEY: Factual

131. How many pairs of cranial nerves do humans have?
a. 6
b. 8
c. 10
d. 12

ANS: D PTS: 1 DIF: 2 REF: Page 47
OBJ: 2.7 KEY: Factual

132. Which of the cranial nerves provides input and feedback from the heart, liver, and digestive tract?
a. the trochlear nerve (IV)
b. the abducens nerve (VI)
c. the hypoglossal nerve (XII)
d. the vagus nerve (X)

ANS: D PTS: 1 DIF: 2 REF: Page 48
OBJ: 2.7 KEY: Factual

133. Which of the cranial nerves do we use to produce facial expressions?
a. the trigeminal nerve (V)
b. the facial nerve (VII)
c. the trochlear nerve (IV)
d. The spinal accessory nerve (XI)

ANS: B PTS: 1 DIF: 2 REF: Page 48
OBJ: 2.7 KEY: Factual

134. Which of the following statements accurately describes the ability of cranial nerves to carry sensory and motor information?
a. Half of the cranial nerves carry sensory information and the other half of the cranial nerves carry motor information.
b. All cranial nerves carry both sensory and motor information.
c. Some cranial nerves carry just sensory information, while all of the others carry both sensory and motor information.
d. Some cranial nerves carry sensory information, others carry motor information, and still others carry both sensory and motor information.

ANS: D PTS: 1 DIF: 3 REF: Page 48
OBJ: 2.7 KEY: Factual MSC: New

135. Efferent spinal nerves exit the _____ root and carry _____ information.
a. ventral; sensory
b. ventral; motor
c. dorsal; sensory
d. dorsal; motor

ANS: D PTS: 1 DIF: 2 REF: Page 48
OBJ: 2.7 KEY: Factual

136. Damage to a mixed nerve is likely to produce impairments in _____ for a part of the body.
a. both sensation and motor control
c. motor control only

b. sensation only
d. neither sensation nor motor control

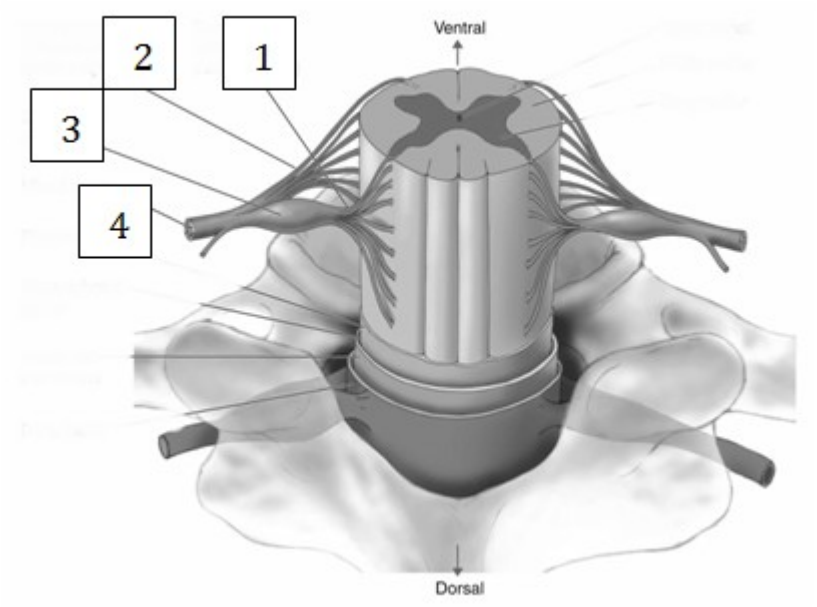
ANS: A PTS: 1 DIF: 2 REF: Page 48
OBJ: 2.7 KEY: Factual

137. Dorsal spinal ganglia
a. are located in the ventral horns of the spinal cord.
b. contain the cell bodies of efferent nerves.
c. are located in the dorsal horns of the spinal cord.
d. contain the cell bodies of afferent nerves.

ANS: D PTS: 1 DIF: 3 REF: Page 49
OBJ: 2.7 KEY: Factual

138. _____ spinal nerves are myelinated.
a. All
b. None of the
c. All efferent
d. All afferent

ANS: C PTS: 1 DIF: 3 REF: Page 49
OBJ: 2.7 KEY: Factual



139. The structure designated "3" in this illustration
a. transmits efferent data from the central nervous system to muscles and glands.
b. transmits afferent data from the periphery to the central nervous system.
c. is a mixed nerve, carrying both afferent and efferent data to and from the central nervous system.
d. is a sympathetic ganglion, and participates in autonomic arousal.

ANS: B
(see Figure 2.23)

PTS: 1 DIF: 3 REF: Page 49 OBJ: 2.7

KEY: Factual MSC: New

140. The dull, aching feeling that often follows injury is probably carried by _____ nerves.
a. myelinated efferent
b. unmyelinated efferent
c. myelinated afferent
d. unmyelinated afferent

ANS: D PTS: 1 DIF: 2 REF: Page 49
OBJ: 2.7 KEY: Factual

141. The autonomic nervous system directly controls
a. the skeletal muscles.
b. the heart, lungs, and other organs.
c. the reticular formation.
d. temperature regulation.

ANS: B PTS: 1 DIF: 1 REF: Page 49
OBJ: 2.8 KEY: Factual

142. Biofeedback training allows people to consciously control processes normally managed by the
a. frontal lobe.
b. reticular formation.
c. somatic nervous system.
d. autonomic nervous system.

ANS: D PTS: 1 DIF: 1 REF: Page 49
OBJ: 2.8 KEY: Factual

143. Internal stimuli, such as the arrival of food in the digestive system, normally activate
a. the somatic nervous system.
b. the parasympathetic nervous system.
c. the sympathetic nervous system.
d. both the parasympathetic and sympathetic nervous systems.

ANS: B PTS: 1 DIF: 2 REF: Page 50
OBJ: 2.8 KEY: Factual

144. The body's “fight or flight” response is managed by
a. the somatic nervous system.
b. the parasympathetic nervous system.
c. the sympathetic nervous system.
d. both the parasympathetic and sympathetic nervous systems.

ANS: C PTS: 1 DIF: 2 REF: Page 50
OBJ: 2.8 KEY: Factual

145. Salivation and digestion are inhibited during activation of
a. the somatic nervous system.
b. the parasympathetic nervous system.
c. the sympathetic nervous system.
d. both the parasympathetic and sympathetic nervous systems.

ANS: C PTS: 1 DIF: 2 REF: Page 50
OBJ: 2.8 KEY: Factual

146. Which of the following systems synapse on a chain of ganglia just outside the spinal cord?

a. the somatic nervous system
b. the parasympathetic nervous system
c. the sympathetic nervous system
d. both the parasympathetic and sympathetic nervous systems

ANS: C PTS: 1 DIF: 2 REF: Page 50
OBJ: 2.8 KEY: Factual

147. Which of the following is a consequence of sympathetic nervous system activity?
a. increased heart rate
b. increased digestion
c. increased salivation
d. decreased blood pressure

ANS: A PTS: 1 DIF: 1 REF: Page 50
OBJ: 2.8 KEY: Factual

148. In the parasympathetic nervous system
a. both pre- and post-ganglionic synapses use norepinephrine.
b. both pre- and post-ganglionic synapses use acetylcholine.
c. pre-ganglionic synapses use norepinephrine, and post-ganglionic synapses use acetylcholine.
d. pre-ganglionic synapses use acetylcholine, and post-ganglionic synapses use norepinephrine.

ANS: B PTS: 1 DIF: 3 REF: Page 50
OBJ: 2.8 KEY: Factual

149. Sexual activity involves
a. the parasympathetic nervous system only.
b. the sympathetic nervous system only.
c. both the parasympathetic and sympathetic nervous systems.
d. neither the parasympathetic nor the sympathetic nervous system.

ANS: C PTS: 1 DIF: 2 REF: Page 50
OBJ: 2.8 KEY: Factual

150. Constriction of blood vessels near the skin's surface is a characteristic of activity in
a. the somatic nervous system.
b. the sympathetic nervous system.
c. the parasympathetic nervous system.
d. both the sympathetic and parasympathetic nervous systems.

ANS: B PTS: 1 DIF: 2 REF: Page 50
OBJ: 2.8 KEY: Factual

151. The neurons associated with the parasympathetic nervous system are located in the _____ of the spinal cord.
a. lumbar and sacral divisions
b. thoracic and lumbar divisions
c. brain and sacral division
d. brain and lumbar division

ANS: C PTS: 1 DIF: 2 REF: Page 52
OBJ: 2.8 KEY: Factual

152. The brain structure with the most direct responsibility over the autonomic nervous system is the
a. amygdala.
b. cingulate cortex.
c. hippocampus.
d. hypothalamus.

ANS: D PTS: 1 DIF: 2 REF: Page 52
OBJ: 2.8 KEY: Factual

153. Which of the following statements offers the best definition of evolution?
a. Evolution describes descent with modifications from a common ancestor.
b. Evolution describes how humans evolved from chimpanzees.
c. Evolution describes the origin of life from the big bang.
d. Evolution describes the transmission of dominant and recessive traits to offspring.

ANS: A PTS: 1 DIF: 2 REF: Page 53
OBJ: 2.9 KEY: Factual MSC: New

154. Researchers studying two species of frogs found that one species seemed to be more numerous in ponds with lots of fishes whereas the other species was more numerous in ponds with relatively fewer fishes. Using your understanding of the evolutionary concept of fitness, choose the statement that best describes the situation.
a. It is only a matter of time before one of these species becomes more numerous in both ponds because certain traits are reproduced more successfully than others regardless of environment.
b. It is likely that the two species differ in a trait that makes one better suited to ponds with lots of fishes and one better suited to ponds with fewer fishes.
c. Both species are likely to become extinct in the near future as neither can successfully cohabit with fishes.
d. Over time the numbers of the two species will become more equal, regardless of the type of pond they inhabit.

ANS: B PTS: 1 DIF: 2 REF: Page 53
OBJ: 2.9 KEY: Application MSC: New

155. Natural selection refers to the
a. ability of farmers and breeders to develop animals with specific traits, such as fast horses and hairless Chihuahuas.
b. ability to select embryos with certain characteristics during in vitro fertilization.
c. success of one genotype relative to others due to fitness.
d. dominance of genes for one trait, such as dark eye color, over another, such as blue eye color.

ANS: C PTS: 1 DIF: 2 REF: Page 53
OBJ: 2.9 KEY: Factual MSC: New

156. Why do some researchers believe that natural blonde hair will disappear as a natural trait within the next 200 years?
a. People with blonde hair are more susceptible to many diseases, including cancer, limiting their ability to reproduce.
b. People with blonde hair are less fertile than people with dark hair.
c. Genes responsible for blonde hair are mutating at high rates.

d. Blonde hair is a recessive trait and social factors, such as mobility, may reduce the likelihood that pairs of individuals, both of whom have genes for blonde hair, will meet, mate, and reproduce.

ANS: D PTS: 1 DIF: 2 REF: Page 53
OBJ: 2.9 KEY: Factual MSC: New

157. The first animals with simple nerve nets probably evolved about _____ years ago.
a. 4.5 billion
b. 3.5 billion
c. 700 million
d. 250 million

ANS: C PTS: 1 DIF: 2 REF: Page 54
OBJ: 2.9 KEY: Factual

158. Animals with the first rudimentary brains probably evolved about _____ years ago.
a. 4.5 billion
b. 3.5 billion
c. 700 million
d. 250 million

ANS: D PTS: 1 DIF: 2 REF: Page 54
OBJ: 2.9 KEY: Factual

159. The first somewhat human brain probably developed about _____ million years ago.
a. 700
b. 250
c. 10
d. 4

ANS: D PTS: 1 DIF: 2 REF: Page 54
OBJ: 2.9 KEY: Factual

160. True brains and spinal cords occurred first in
a. chordates.
b. mollusca.
c. crustacean.
d. hemichordates.

ANS: A PTS: 1 DIF: 2 REF: Page 54
OBJ: 2.9 KEY: Factual

161. Chordate nervous systems differ from nonchordate nervous systems in that
a. chordate nervous systems run along the ventral side of the animal.
b. chordate nervous systems run along the dorsal side of the animal.
c. nonchordate nervous systems have brains rather than ganglia.
d. nonchordate nervous systems provide faster reactions to sensory information.

ANS: B PTS: 1 DIF: 2 REF: Page 54
OBJ: 2.9 KEY: Factual

162. Among chordates, early brains have _____ than later developing brains.
a. larger cerebellums
b. more convoluted cortices
c. larger olfactory bulbs
d. smaller cerebellums and less convoluted cortices

ANS: D PTS: 1 DIF: 2 REF: Page 54
OBJ: 2.9 KEY: Factual

163. The first *Homo sapiens* appeared about _____ years ago.
a. 4 million
b. 2 million
c. 300,000
d. 200,000

ANS: D PTS: 1 DIF: 2 REF: Page 55
OBJ: 2.9 KEY: Factual

164. Human children can first recognize themselves in a mirror around the age of
a. 6 months
b. 18 months
c. 2 years
d. 3 years

ANS: B PTS: 1 DIF: 2 REF: Page 55
OBJ: 2.9 KEY: Factual MSC: New

165. In addition to humans, which of the following animals appear to be able to recognize themselves in the mirror?
a. all mammals
b. all monkeys and apes
c. chimpanzees, orangutans, and elephants
d. no other animals can recognize themselves in the mirror

ANS: C PTS: 1 DIF: 2 REF: Page 55
OBJ: 2.9 KEY: Factual MSC: New

166. Researchers attempting to locate the sense of self in the brain have suggested that
a. their goal is impossible to achieve.
b. the frontal lobes probably participate in our sense of self.
c. the occipital and parietal lobes are essential for maintaining our sense of self.
d. the left hemisphere plays a dominant role in our sense of self.

ANS: B PTS: 1 DIF: 2 REF: Page 55
OBJ: 2.9 KEY: Factual MSC: New

167. The most accurate assessment of the relative intelligence of different species is the
a. absolute weight of an animal's brain.
b. ratio of brain weight to body weight.
c. encephalization quotient.
d. cerebral quotient.

ANS: C PTS: 1 DIF: 2 REF: Page 56
OBJ: 2.9 KEY: Factual

168. Brain development among hominid species
a. occurred very quickly.
b. occurred very slowly and unevenly.
c. occurred very slowly and gradually.
d. has appeared to speed up in the last century.

ANS: A PTS: 1 DIF: 2 REF: Page 56
OBJ: 2.9 KEY: Factual

169. Compared with early examples of *Homo sapiens*, modern humans have
a. much larger brains.
c. brains that are about the same size.

b. smaller brains.
d. more convoluted brains.

ANS: C PTS: 1 DIF: 2 REF: Page 56
OBJ: 2.9 KEY: Factual

170. Agriculture, urbanization, and literacy appear to have produced _____ in human brain size.
a. large amounts of additional growth
b. modest amounts of additional growth
c. no apparent changes
d. possible reductions

ANS: C PTS: 1 DIF: 2 REF: Page 57
OBJ: 2.9 KEY: Factual

171. Factors that may limit human brain size include
a. the brain's requirements for calcium.
b. gender differences in brain size.
c. the brain's need for fatty acids.
d. difficulties in childbirth.

ANS: D PTS: 1 DIF: 2 REF: Page 57
OBJ: 2.9 KEY: Factual

172. Among the possible reasons for the rapid growth of hominid brains is the fact that
a. hominids enjoyed rich supplies of protein from meat, eggs, and seafood.
b. the development of agriculture led to more stable food supplies.
c. urbanization, or the development of cities, favored brains capable of more complex thinking.
d. the development of literacy stimulated considerable brain growth.

ANS: A PTS: 1 DIF: 2 REF: Page 57
OBJ: 2.9 KEY: Factual MSC: New

TRUE/FALSE

1. True or false? The parietal lobes are found rostral to the occipital lobes and posterior to the frontal lobes.

ANS: T PTS: 1 DIF: 2 REF: Page 27
OBJ: 2.1 KEY: Factual MSC: New

2. True or false? The arachnoid layer of the meninges is found in both the central and peripheral nervous systems.

ANS: F PTS: 1 DIF: 1 REF: Page 28
OBJ: 2.2 KEY: Factual MSC: New

3. True or false? Nerves originating in the lumbar division of the spinal cord serve the lower back and legs.

ANS: T PTS: 1 DIF: 1 REF: Page 34

OBJ: 2.3 KEY: Factual MSC: New

4. True or false? The reticular formation extends from the medulla through the pons and into the midbrain.

   ANS: T PTS: 1 DIF: 1 REF: Page 35
   OBJ: 2.4 KEY: Factual MSC: New

5. True or false? The amygdala participates in emotional behavior, and fear in particular.

   ANS: T PTS: 1 DIF: 1 REF: Page 40
   OBJ: 2.4 KEY: Factual MSC: New

6. True or false? Primary auditory cortex is found in the parietal lobe of the cerebral cortex.

   ANS: F PTS: 1 DIF: 1 REF: Page 44
   OBJ: 2.5 KEY: Factual MSC: New

7. True or false? Primary somatosensory cortex is located in the precentral gyrus of the frontal lobe.

   ANS: F PTS: 1 DIF: 1 REF: Page 44
   OBJ: 2.6 KEY: Factual MSC: New

8. True or false? All cranial nerves carry both sensory and motor information to and from the brain.

   ANS: F PTS: 1 DIF: 1 REF: Page 47
   OBJ: 2.7 KEY: Factual MSC: New

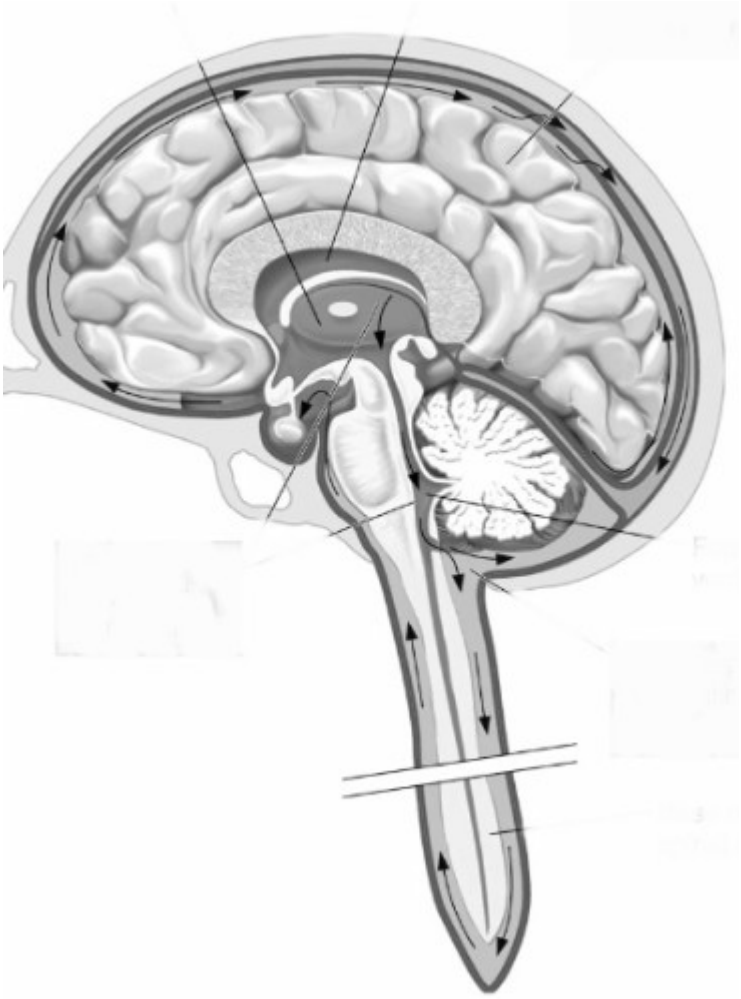
9. True or false? Neurons comprising the parasympathetic division of the autonomic nervous system are located in the brain and sacral divisions of the spinal cord.

   ANS: T PTS: 1 DIF: 1 REF: Page 52
   OBJ: 2.8 KEY: Factual MSC: New

10. True or false? Within a species, brain size is strongly and positively correlated with an individual's intelligence.

    ANS: F PTS: 1 DIF: 2 REF: Page 56
    OBJ: 2.9 KEY: Factual MSC: New

COMPLETION

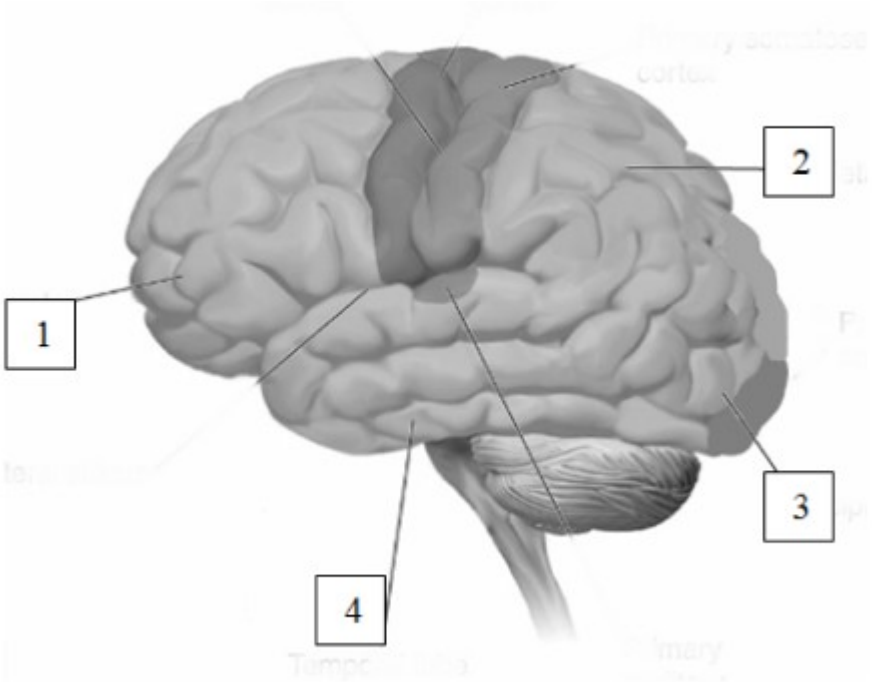
1. 

In this illustration, cerebrospinal fluid is shown moving from its place of synthesis in the _____ of the ventricles, through the _____ of the spinal cord, and into the _____ within the meninges.

ANS:
choroid plexus, central canal, subarachnoid space

(See Figure 2.5b).

PTS: 1 DIF: 2 REF: Page 31 OBJ: 2.2
KEY: Factual MSC: New



2.

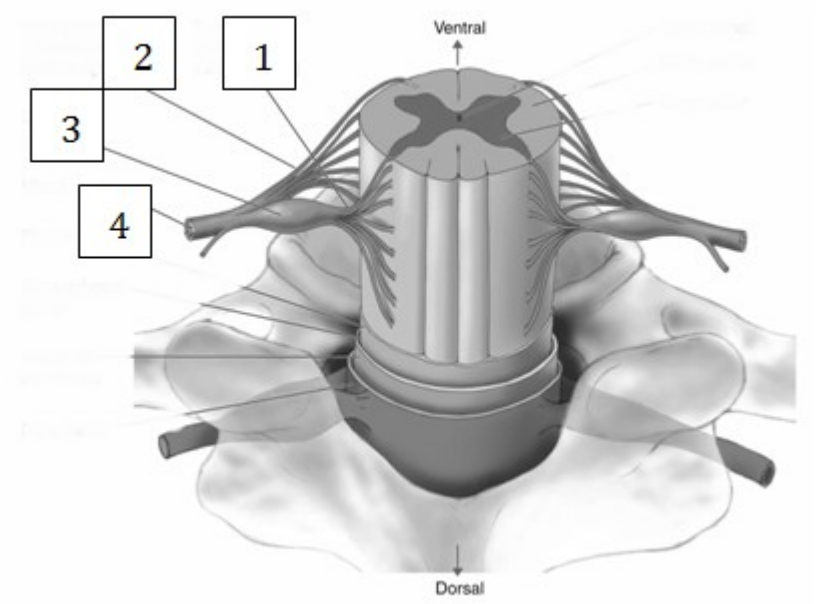
Fill in the names of the four lobes depicted in this figure:

Area 1: _____
Area 2: _____
Area 3: _____
Area 4: _____

ANS:
frontal, parietal, occipital, temporal

(see Figure 2.19)

PTS: 1 DIF: 2 REF: Page 45 OBJ: 2.5
KEY: Factual MSC: New

3. 

The nerve fibers designated as “1” in this illustration carry _____ information, and the nerve fibers designated as “2” carry _____ information.

ANS:
sensory (afferent), motor (efferent)
sensory, motor
afferent, efferent
(see Figure 2.23)

PTS: 1 DIF: 2 REF: Page 49 OBJ: 2.7
KEY: Factual MSC: New

SHORT ANSWER

1. What are the three major planes of sections used in neuroanatomy?

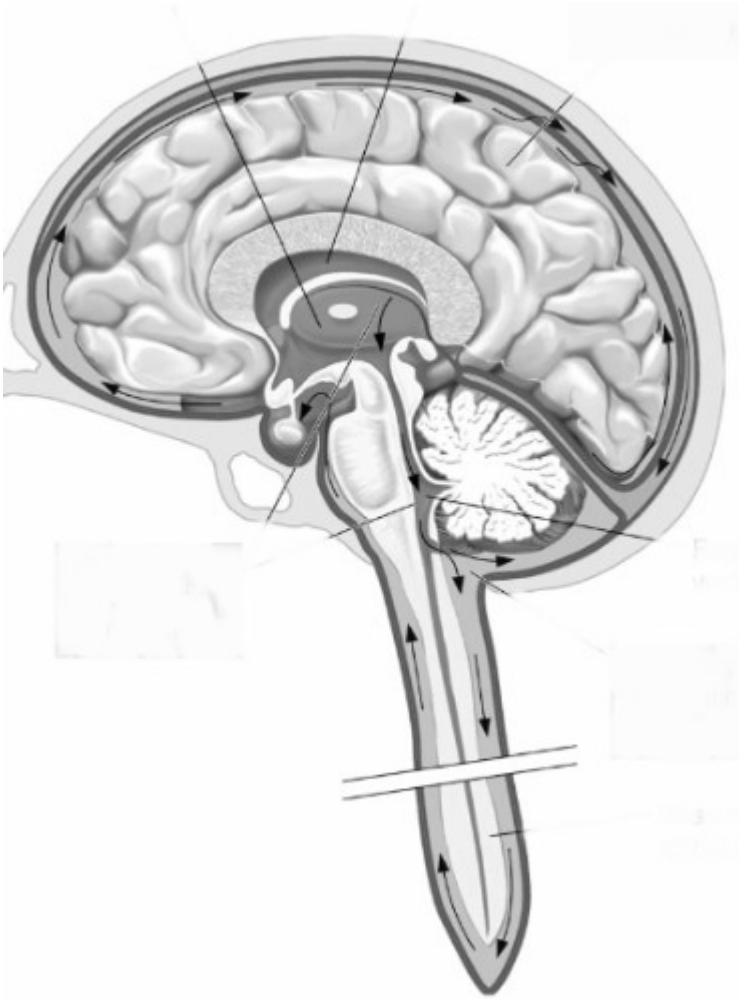
   ANS:
   Sagittal sections are parallel to the midline, coronal sections divide the brain from front to back, and horizontal sections divide the brain from top to bottom.

   PTS: 1 DIF: 2 REF: Page 28 OBJ: 2.1
   KEY: Factual MSC: New

2. What is the purpose of the cerebrospinal fluid?

   ANS:
   Cerebrospinal fluid cushions the brain, minimizing damage in the event of head injury and preventing unwanted stimulation of neurons due to pressure.

PTS: 1 DIF: 2 REF: Page 30 OBJ: 2.2
KEY: Factual MSC: New



3. Briefly describe the circulation of the cerebrospinal fluid, beginning with its synthesis and ending with its reabsorption.

ANS:
Refer to Figure 2.5b.

PTS: 1 DIF: 2 REF: Page 31 OBJ: 2.2
KEY: Factual MSC: New

4. What are the major functions of the spinal cord?

ANS:
The spinal cord carries information to and from the brain and manages a variety of protective and movement reflexes.

PTS: 1 DIF: 1 REF: Page 35 OBJ: 2.3
KEY: Factual MSC: New

5. Describe the major functions of the cerebellum.

ANS:
The cerebellum traditionally has been viewed as contributing to motor coordination and balance, but it also appears to participate in higher level cognitive processing in humans.

PTS: 1 DIF: 1 REF: Page 37 OBJ: 2.4
KEY: Factual MSC: New

6. What is the limbic system?

ANS:
The limbic system is a collection of structures embedded within the forebrain that participate in learning, memory, and emotion.

PTS: 1 DIF: 1 REF: Page 39 OBJ: 2.4
KEY: Factual MSC: New

7. What functions are primarily managed by the occipital lobe?

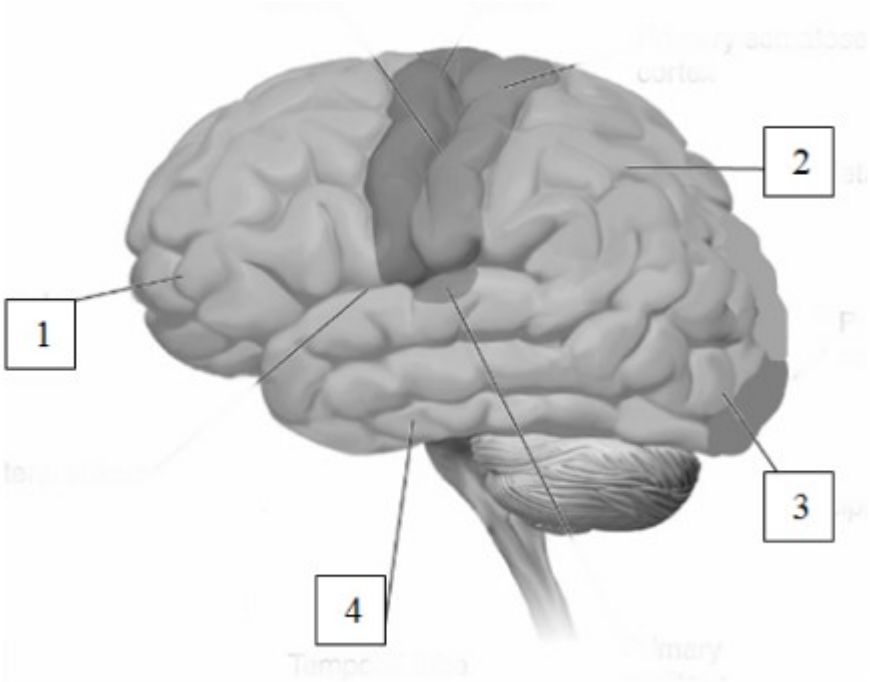
ANS:
The occipital lobe is primarily involved with visual processing.

PTS: 1 DIF: 1 REF: Page 44 OBJ: 2.5
KEY: Factual MSC: New

8. Define association cortex.

ANS:
Association cortex does not have a designated role in the processing of either sensory or motor information. Instead, it provides bridges or connections between these two functions.

PTS: 1 DIF: 1 REF: Page 44 OBJ: 2.6
KEY: Factual MSC: New



9. Provide one example of a function that is localized to each of the four areas illustrated in this figure.

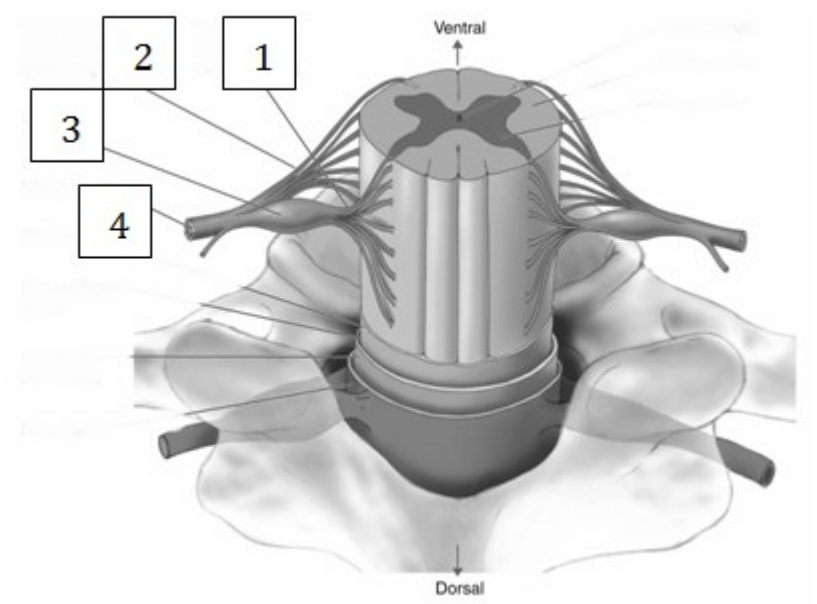
   ANS:
   Refer to Figure 2.19)

   PTS: 1 DIF: 2 REF: Page 45 OBJ: 2.5
   KEY: Factual MSC: New

10. Describe the functions of two of the cranial nerves.

    ANS:
    Various. Example: The olfactory nerve (Cranial N. 1) carries information from the olfactory neurons of the nose to the brain. The vagus nerve (Cranial N. 10) carries information both to and from various internal organs, including the heart, lungs, and digestive system.

    PTS: 1 DIF: 2 REF: Page 47 OBJ: 2.7
    KEY: Factual MSC: New

11. 

Briefly identify the structures labeled 1, 2, 3, and 4, and describe their functions.

ANS:
Refer to Figure 2.23.

PTS: 1 DIF: 2 REF: Page 49 OBJ: 2.7
KEY: Factual MSC: New

12. What are the major functions of the sympathetic and parasympathetic nervous systems?

ANS:
The sympathetic nervous system is active during periods of arousal, stress, and emergency, and prepares the body for "fight-or-flight." The parasympathetic nervous system is active during times of calm, and participates in the storage of nutrients and the repair of the body.

PTS: 1 DIF: 2 REF: Page 50 OBJ: 2.8
KEY: Factual MSC: New

13. How has the human brain changed over the last 100,000 to 200,000 years?

ANS:
The human brain has changed surprisingly little over the last 100,000 to 200,000 years, in spite of advances such as agriculture and literacy.

PTS: 1 DIF: 1 REF: Page 56 OBJ: 2.9
KEY: Factual MSC: New

ESSAY

1. The actor Christopher Reeve damaged his cervical spinal cord during a tragic horseback riding accident. Based on your knowledge of the structure and functions of the spinal cord, what challenges did Reeve face as a result of his accident?

   ANS:
   Answer not provided

   PTS: 1 OBJ: 2.3

2. Emotion is processed at various levels in the brain. Why do you think we would see this apparent duplication of function?

   ANS:
   Answer not provided

   PTS: 1 OBJ: 2.4

3. Stress usually involves higher-than-normal levels of sympathetic arousal. Given your understanding of the autonomic nervous system, what effects might extended sympathetic arousal produce?

   ANS:
   Answer not provided

   PTS: 1 OBJ: 2.8