

# 11

## Nervous Tissue and the Central Nervous System

### I. Organization and Functions of the Nervous System

☞ *Concept:* The central nervous system and the peripheral nervous system are structural components of the nervous system, whereas the autonomic nervous system is a functional component. Together they orient the body, coordinate body activities, permit the assimilation of experiences, and program instinctual behavior.

#### A. Multiple Choice Questions

- \_\_\_ 1. The central nervous system (CNS) includes
- (a) the brain and cranial nerves.
  - (b) the brain and spinal nerves.
  - (c) the brain and spinal cord.
  - (d) the brain only.
- \_\_\_ 2. The portion of the nervous system considered a functional subdivision is
- (a) the autonomic nervous system.
  - (b) the ganglionic division.
  - (c) the peripheral nervous system.
  - (d) the splanchnic nervous system.
- \_\_\_ 3. Which of the following is *not* a function of the CNS?
- (a) orienting the body
  - (b) coordinating and controlling bodily activities
  - (c) assimilating experiences
  - (d) programming instinctual behavior
  - (e) all of the above are functions of the CNS

#### B. True–False Questions

- \_\_\_ 1. Neurology is the study of the diseases of the nervous system.
- \_\_\_ 2. The nervous system functions with the circulatory system in coordinating the activities of the other body systems.
- \_\_\_ 3. The functions of the autonomic nervous system are independent of those of the central and peripheral nervous systems in regulating the visceral organs.

### II. Developmental Exposition of the Brain

#### A. Multiple Choice Questions

- \_\_\_ 1. Of the five regions of the brain, the one that does *not* differentiate from a developmental region having a different name is
- (a) the mesencephalon.
  - (b) the metencephalon.
  - (c) the diencephalon.
  - (d) the telencephalon.
  - (e) the myelencephalon.

- \_\_\_\_\_ 2. The cerebral hemispheres are located within  
 (a) the diencephalon. (d) the myelencephalon.  
 (b) the telencephalon. (e) the mesencephalon.  
 (c) the metencephalon.
- \_\_\_\_\_ 3. The spinal cord attaches to the brain at the region of  
 (a) the mesencephalon. (d) the telencephalon.  
 (b) the metencephalon. (e) the myelencephalon.  
 (c) the diencephalon.

### B. True–False Questions

- \_\_\_\_\_ 1. The central nervous system derives from ectoderm, whereas the peripheral nervous system derives from mesoderm.
- \_\_\_\_\_ 2. All of the neurons and most of the neuroglia of the body derive from the embryonic neural plate.

### C. Completion Questions

1. The appearance of the \_\_\_\_\_ at about 17 days is the first indication of nervous tissue development.
2. Neurons and the \_\_\_\_\_ that support them arise from the neural plate.
3. Most of the PNS forms from the \_\_\_\_\_.
4. The \_\_\_\_\_ is the developmental forebrain, which gives rise to the telencephalon and the diencephalon.

## III. Neurons and Neuroglia

☞ *Concept:* Neurons come in many forms, but all contain dendrites for reception and an axon for the conduction of nerve impulses. The various types of neurons may be classified on the basis of structure or function. Different types of neuroglia support the neurons, both structurally and functionally.

### A. Multiple Choice Questions

- \_\_\_\_\_ 1. Which of the following is *not* true of neurons?  
 (a) They respond to physical and chemical stimuli.  
 (b) They are the most abundant cells of nervous tissue.  
 (c) They all conduct nerve impulses.  
 (d) They all release chemical regulators.  
 (e) They cannot divide mitotically.
- \_\_\_\_\_ 2. Which two terms refer to clusters of cell bodies of neurons in the CNS and PNS, respectively?  
 (a) nuclei and ganglia  
 (b) chromatophilic substances and neuroglia  
 (c) neurofibrils and ganglia  
 (d) perikarya and ganglia  
 (e) nuclei and neuroglia

- \_\_\_ 3. Which of the following is *not* an actual structural component of a neuron or an organelle within a neuron?  
 (a) dendrite (d) chromatophilic substance  
 (b) neurofibril (e) neurolemmocyte  
 (c) axon
- \_\_\_ 4. The neuroglia, or glial cells, that form myelin in the CNS and guide the development of neurons in the CNS are  
 (a) neurolemmocytes. (d) astrocytes.  
 (b) microglia. (e) ganglionic gliocytes.  
 (c) oligodendrocytes.
- \_\_\_ 5. Which of the following terms is *incorrect* as applied to a type of neuron?  
 (a) sensory (afferent) (d) mixed  
 (b) multipolar (e) association  
 (c) pseudounipolar

## B. True–False Questions

- \_\_\_ 1. A person is born with all the neurons he or she is capable of producing.
- \_\_\_ 2. The cell body is the enlarged portion of the neuron that contains the nucleus and nucleolus and the surrounding cytoplasm.
- \_\_\_ 3. It is thought that axonal transport within neurons is responsible for the movement of the herpes virus, rabies virus, and tetanus toxin.
- \_\_\_ 4. Both the neurolemma and the myelin layer surrounding the axon of a neuron are responsible for regeneration.
- \_\_\_ 5. Neurons within the brain contain vascular processes that are structurally involved in the blood-brain barrier.
- \_\_\_ 6. The autonomic nervous system is characterized by the presence of sensory and motor bipolar neurons.
- \_\_\_ 7. Somatic motor nerve fibers convey impulses from the CNS to the skeletal muscles, causing them to contract.

## IV. Transmission of Impulses

☞ *Concept:* Movements of sodium and potassium ions across the axon membrane trigger impulses that travel through the neuron toward a synapse. Synaptic transmission is facilitated by the secretion of a neurotransmitter chemical.

### A. Multiple Choice Questions

- \_\_\_ 1. During depolarization of an axon,  
 (a) the cell wall becomes impermeable to ionic movement.  
 (b) Na<sup>+</sup> moves into the cell and K<sup>+</sup> moves out of the cell.  
 (c) there is equalization of ionic concentration on both sides of the cell membrane.  
 (d) Na<sup>+</sup> moves out the cell and K<sup>+</sup> moves into the cell.

- \_\_\_\_\_ 2. Which of the following statements is *incorrect* concerning a nerve impulse?
- (a) It travels in only one direction.
  - (b) It is an all-or-none response.
  - (c) It is the actual movement of Na<sup>+</sup> and K<sup>+</sup> ions.
  - (d) It always progresses from dendrites, to cell body, to axon.
  - (e) All of the statements are true.
- \_\_\_\_\_ 3. The speed of a nerve impulse is determined by all of the following *except*
- (a) the diameter of the nerve fiber.
  - (b) the intensity of the stimulus.
  - (c) the presence or absence of myelin.
  - (d) the degree of myelination.
- \_\_\_\_\_ 4. Synaptic transmission is made possible by
- (a) membrane transport.
  - (b) an ion pump.
  - (c) saltatory conduction.
  - (d) neurotransmitters.

## B. True–False Questions

- \_\_\_\_\_ 1. Synaptic transmission is made possible by the secretion of cholinesterase by the synaptic vesicles of a presynaptic neuron.
- \_\_\_\_\_ 2. As an impulse extends along an axon, there is a slight loss in amplitude due to current spread.
- \_\_\_\_\_ 3. The speed of impulse conduction is faster in myelinated neurons with relatively large diameters than in unmyelinated nerve fibers with small diameters.
- \_\_\_\_\_ 4. Aspirin and caffeine affect the nervous system by altering the rates, or speed, of nerve conduction.

## V. General Features of the Brain

☞ *Concept:* The brain is enclosed by the cranium and meninges and is bathed in cerebrospinal fluid. The tremendous metabolic rate of the brain makes it highly susceptible to oxygen deprivation.


### A. Multiple Choice Questions

- \_\_\_\_\_ 1. Cerebrospinal fluid would *not* be found in
- (a) the central canal.
  - (b) the lateral ventricle.
  - (c) the subarachnoid space.
  - (d) the cerebral arterial circle.
- \_\_\_\_\_ 2. Which of the following is *not* composed of gray matter?
- (a) nuclei
  - (b) the cerebral cortex
  - (c) the cerebellar cortex
  - (d) the optic tract
- \_\_\_\_\_ 3. Which two descriptors relate to the adult human brain?
- (a) 0.5 kg/1 billion neurons
  - (b) 1.0 kg/10 billion neurons
  - (c) 1.5 kg/100 billion neurons
  - (d) 2 kg/1 trillion neurons
  - (e) 5 kg/10 trillion neurons

## B. True-False Questions

- \_\_\_ 1. The entire CNS is protected by a bony encasement.
- \_\_\_ 2. The brain is the only part of the CNS that is covered with meninges and bathed in cerebrospinal fluid.
- \_\_\_ 3. Gray matter exists only as the outer covering of the brain, where it is convoluted.
- \_\_\_ 4. White matter within the brain consists of aggregations of dendrites and myelinated axons and associated neuroglia.
- \_\_\_ 5. The brain of an adult receives approximately 20% of the total resting cardiac output.
- \_\_\_ 6. The volume of blood flow to the brain varies considerably depending on the extent of mental or physical activity.

## VI. Cerebrum

 *Concept:* The cerebrum, consisting of five paired lobes within two convoluted hemispheres, is concerned with higher brain functions, including the perception of sensory impulses, the instigation of voluntary movement, the storage of memory, thought processes, and reasoning ability. The cerebrum is also concerned with instinctual and limbic (emotional) functions.

### A. Multiple Choice Questions

- \_\_\_ 1. Which of the following statements is *false* regarding the cerebrum?
  - (a) It is located within the diencephalon.
  - (b) It contains the lateral ventricles.
  - (c) It accounts for 80% of the brain's mass.
  - (d) It is convoluted at the cortex.
  - (e) It is composed of five paired lobes.
- \_\_\_ 2. The right and left cerebral hemispheres are incompletely separated by
  - (a) the central sulcus.
  - (b) the corpus callosum.
  - (c) the sagittal fissure.
  - (d) the longitudinal cerebral fissure.
  - (e) a splitting headache.
- \_\_\_ 3. Which of the following is *not* a paired cerebral lobe?
  - (a) occipital lobe
  - (b) sphenoid lobe
  - (c) temporal lobe
  - (d) insula
  - (e) frontal lobe
- \_\_\_ 4. The precentral gyrus is an important motor area located within
  - (a) the occipital lobe
  - (b) the sphenoid lobe
  - (c) the temporal lobe
  - (d) the parietal lobe
  - (e) the frontal lobe
- \_\_\_ 5. The specific area of the cerebrum that interprets somatesthetic sensations is
  - (a) the postcentral gyrus.
  - (b) the motor speech area.
  - (c) the holistic center.
  - (d) the consciousness center.
  - (e) the thalamus.

- \_\_\_ 6. Which association of a cerebral lobe with a function is *incorrect*?
- (a) parietal and speech
  - (b) frontal and voluntary motor control
  - (c) insula and visual perception
  - (d) temporal and auditory perception
  - (e) occipital and eye focusing
- \_\_\_ 7. An EEG pattern of 1 to 5 cycles/second in an awake adult would be identified as
- (a) an alpha wave.                      (c) a theta wave.
  - (b) a beta wave.                         (d) a delta wave.
- \_\_\_ 8. Fiber tracts that connect one cerebral lobe to another within the same hemisphere are known as
- (a) association fibers.                    (d) spindle fibers.
  - (b) intrinsic fibers.                      (e) commissural fibers.
  - (c) projection fibers.
- \_\_\_ 9. Motor dysfunctions, including rigidity, tremor, and rapid aimless movement, are the result of neural diseases or physical trauma to
- (a) the motor speech area.              (c) the tentorium cerebelli.
  - (b) the postcentral gyrus.              (d) the basal nuclei.

## B. True–False Questions

- \_\_\_ 1. Cerebral gyri and cerebral sulci form the convolutions of the white matter within the cerebral cortex.
- \_\_\_ 2. The central sulcus extends at right angles from the longitudinal cerebral fissure to the lateral sulcus and separates the frontal lobe from the parietal lobe.
- \_\_\_ 3. There is a direct correlation between the size of the body being served and the size of the precentral gyrus responsible for the motor movement in that area.
- \_\_\_ 4. The paired insula of the cerebrum store memory and integrate other cerebral functions.
- \_\_\_ 5. The recording of theta brain waves in adults generally indicates severe emotional stress and can be a forewarning of a nervous breakdown.
- \_\_\_ 6. Association fiber tracts connect nuclei that have similar functions in both cerebral hemispheres.
- \_\_\_ 7. The basal nuclei are specialized masses of gray matter that initiate voluntary muscle movement.
- \_\_\_ 8. The motor speech area is generally located in the left frontal lobe.

## VII. Diencephalon

☞ *Concept:* The diencephalon is a major autonomic region of the brain that consists of such vital structures as the thalamus, hypothalamus, epithalamus, and pituitary gland.

### A. Multiple Choice Questions


- \_\_\_ 1. A structure that is *not* located in the diencephalon is
- (a) the thalamus.                         (d) the pons.
  - (b) the pituitary gland.                 (e) the epithalamus.
  - (c) the hypothalamus.

- \_\_\_\_\_ 2. The regulation of which of the following functions is *not* attributed to the hypothalamus?
- (a) basic rhythmic respiration      (d) sleep  
 (b) heartbeat      (e) electrolyte balance  
 (c) body temperature
- \_\_\_\_\_ 3. The infundibulum connects the pituitary gland to
- (a) the pineal gland.      (d) the choroid plexus.  
 (b) the hypothalamus.      (e) none of the above.  
 (c) the thalamus.
- \_\_\_\_\_ 4. Which of the following statements is *true* regarding the pineal gland?
- (a) It extends from the posterior end of the epithalamus.  
 (b) It produces cerebrospinal fluid.  
 (c) It has a neuroendocrine function.  
 (d) It produces antidiuretic hormone (ADH).  
 (e) Both a and c are true.
- \_\_\_\_\_ 5. The surgical procedure called a hypophysectomy is a removal of
- (a) the pineal gland.      (d) the thalamus.  
 (b) the pituitary gland.      (e) none of the above.  
 (c) the hypothalamus.
- \_\_\_\_\_ 6. Which of the following statements is *false* regarding the pituitary gland?
- (a) It is structurally and functionally divided into an adenohypophysis and a neurohypophysis.  
 (b) It secretes a cardiac acceleratory hormone.  
 (c) It is supported by the sella turcica.  
 (d) It is partially controlled by the hypothalamus.  
 (e) It is surrounded by a vascular network called the cerebral arterial circle.

## **B. True–False Questions**

- \_\_\_\_\_ 1. The hypothalamus is the largest structure of the diencephalon.
- \_\_\_\_\_ 2. Although the hypothalamus is regarded as a cardiovascular center, it controls only the autonomic acceleration of the heart.
- \_\_\_\_\_ 3. The experience of orgasm involves neural activity within the sexual center of the hypothalamus.
- \_\_\_\_\_ 4. The feeding center of the hypothalamus consists of nuclei that monitor the blood glucose, fatty acid, and amino acid levels.
- \_\_\_\_\_ 5. The third ventricle is located within the diencephalon and is covered by the epithalamus.

## **VIII. Mesencephalon**


 *Concept:* The mesencephalon contains the corpora quadrigemina, concerned with visual and auditory reflexes, and the cerebral peduncles, composed of fiber tracts. It also contains specialized nuclei that help to control posture and movement.

## A. Matching Questions

Match the structure with its function

- |                            |  |
|----------------------------|--|
| ___ 1. substantia nigra    | (a) motor coordination of reflexes and posture     |
| ___ 2. cerebral peduncle   | (b) visual reflexes                                |
| ___ 3. cerebral aqueduct   | (c) auditory reflexes                              |
| ___ 4. superior colliculus | (d) inhibition of forced involuntary movement      |
| ___ 5. red nucleus         | (e) connection of the third and fourth ventricles  |
| ___ 6. inferior colliculus | (f) relay tract of ascending and descending fibers |

## IX. Metencephalon

 *Concept:* The metencephalon contains the pons, which relays impulses, and the cerebellum, which coordinates skeletal muscle contractions.

### A. Multiple Choice Questions

- \_\_\_ 1. Which of the following structures is (are) *not* located in the metencephalon?  
(a) fourth ventricle (d) cerebellar peduncles  
(b) pons (e) none of the above (all are located in the metencephalon)  
(c) cerebellum
- \_\_\_ 2. The respiratory center(s) of the pons is (are) called  
(a) the apneustic center. (d) the pneumotaxic area.  
(b) the pulmonic center. (e) both a and d.  
(c) the pleura area.
- \_\_\_ 3. The arbor vitae are  
(a) tracts of white matter. (d) books in the Old Testament.  
(b) convoluted ridges. (e) nuclei within the cerebellum.  
(c) connecting tubules.
- \_\_\_ 4. Which of the following statements is *false* concerning the cerebellum?  
(a) It has an outer layer of convoluted gray matter.  
(b) It functions with the pons as a respiratory center.  
(c) It communicates with the rest of the brain through the cerebellar peduncles.  
(d) It consists of two hemispheres.  
(e) All the statements are correct.

### B. True–False Questions

- \_\_\_ 1. All the cranial nerves have derivative nuclei within the pons.
- \_\_\_ 2. The respiratory centers of the pons regulate the rate and depth of breathing.
- \_\_\_ 3. The vermis supports the cerebellum and connects it to the pons.
- \_\_\_ 4. The principal function of the cerebellum is to coordinate muscle contractions.



## X. Myelencephalon

☞ *Concept:* The medulla oblongata, contained within the myelencephalon, connects to the spinal cord and contains nuclei for the cranial nerves and vital autonomic functions.

### A. Multiple Choice Questions

- \_\_\_ 1. The crossing over of projection fibers within the medulla oblongata is referred to as  
(a) a decussation. (c) an extensor connection.  
(b) a chiasma. (d) an internuciation.
- \_\_\_ 2. A cranial nerve that does *not* arise in the medulla oblongata is  
(a) the vagus nerve. (d) the facial nerve.  
(b) the hypoglossal nerve. (e) the glossopharyngeal nerve.  
(c) the accessory nerve.
- \_\_\_ 3. Which of the following statements concerning the medulla oblongata is *false*?  
(a) It contains the fourth ventricle.  
(b) It is a cardiac center in conjunction with the hypothalamus.  
(c) It is located within the myelencephalon.  
(d) It secretes hormones along with the pituitary gland.  
(e) It is a respiratory center in conjunction with the pons.
- \_\_\_ 4. The reticular formation  
(a) arouses the cerebrum. (c) contains motor nuclei.  
(b) regulates digestion. (d) regulates body temperature.

### B. True–False Questions

- \_\_\_ 1. The nucleus ambiguus and nucleus gracilis are the centers from which the vestibulocochlear nerve arises.
- \_\_\_ 2. The vagus nuclei relay sensory information to the thalamus.
- \_\_\_ 3. The vestibulocochlear nerve arises from the inferior olivary nucleus.
- \_\_\_ 4. The reticular activating system assists the cerebellum in selectively stimulating muscle activity.

## XI. Meninges of the Central Nervous System

☞ *Concept:* The CNS is covered by protective meninges; namely, the dura mater, the arachnoid, and the pia mater.

### A. Multiple Choice Questions

- \_\_\_ 1. The meninx closest to the brain is  
(a) the dura mater. (c) the arachnoid.  
(b) the pia mater. (d) the ligamentum denticulatum.
- \_\_\_ 2. Which of the following is *not* a specialized extension of the dura mater?  
(a) falx cerebelli (d) ligamentum denticulatum  
(b) falx cerebri (e) diaphragma sellae  
(c) tentorium cerebelli

- \_\_\_\_\_ 3. Enclosed regions of the meninges that collect venous blood and drain it to the internal jugular veins of the neck are called
- (a) arachnoid villi. (c) subarachnoid spaces.  
(b) epidural spaces. (d) dural sinuses.

### B. True–False Questions

- \_\_\_\_\_ 1. The cranial dura mater is a double-layered structure, whereas the spinal dura mater consists of a single layer.
- \_\_\_\_\_ 2. The periosteal layer of the cranial dura mater is so named because of its contact with the periosteum of the cranium.
- \_\_\_\_\_ 3. The spinal dura mater is referred to as a dural sheath.
- \_\_\_\_\_ 4. The pia mater is composed of dense regular connective tissue.

## XII. Ventricles and Cerebrospinal Fluid

☞ *Concept:* The ventricles, central canal, and subarachnoid space contain cerebrospinal fluid, formed by the active transport of substances from blood plasma in the choroid plexuses.

### A. Multiple Choice Questions

- \_\_\_\_\_ 1. Which of the ventricles of the brain is (are) unpaired?
- (a) first (d) fourth  
(b) second (e) both c and d  
(c) third
- \_\_\_\_\_ 2. Which of the following statements is *false* concerning cerebrospinal fluid (CSF)?
- (a) It is produced by neuroglia within the choroid plexus.  
(b) It cushions and buoys the CNS.  
(c) It has a density close to that of brain tissue.  
(d) It drains from the CNS at the arachnoid villi.
- \_\_\_\_\_ 3. Which of the following would *not* be found in cerebrospinal fluid?
- (a) Na<sup>+</sup> (d) red blood cells  
(b) urea (e) H<sup>+</sup>  
(c) white blood cells

### B. True–False Questions

- \_\_\_\_\_ 1. The buoyed weight of a 1,500-gram brain is about 50 grams because of the suspending cerebrospinal fluid.
- \_\_\_\_\_ 2. Cerebrospinal fluid distributes nutrients to the central nervous system and removes wastes.
- \_\_\_\_\_ 3. A continuous volume of about 800 ml of cerebrospinal fluid buoys the central nervous system.
- \_\_\_\_\_ 4. The pressure of cerebrospinal fluid is about 10 mmHg.
- \_\_\_\_\_ 5. Oligodendrocytes are an important component of the blood-brain barrier.
- \_\_\_\_\_ 6. The blood-brain barrier selectively determines which substances can move from the plasma of the blood to the extracellular fluid of the brain.
- \_\_\_\_\_ 7. Cerebrospinal fluid is secreted from the choroid plexuses of the lateral, third, and fourth ventricles.

### XIII. Spinal Cord

☞ *Concept:* The spinal cord consists of centrally located gray matter, involved in reflexes, and peripherally located ascending and descending tracts of white matter that conduct impulses to and from the brain.

#### A. Multiple Choice Questions

- \_\_\_\_\_ 1. Which of the following statements is *false* concerning the spinal cord?
- (a) The spinal cord terminates at the conus medullaris.
  - (b) There are enlargements of the spinal cord at each vertebral segment.
  - (c) The gray matter is H-shaped and deep to the white matter.
  - (d) The spinal cord ends at the level of L1.
  - (e) Projections of the gray matter within the spinal cord are called horns.
- \_\_\_\_\_ 2. The columns of white matter in the spinal cord are called
- (a) funiculi.
  - (b) cords.
  - (c) fasciculi.
  - (d) bundles.
  - (e) pillars.
- \_\_\_\_\_ 3. The corticospinal tracts
- (a) descend directly from the cerebral cortex to the lower motor neurons without interruption.
  - (b) all decussate (cross over) within the medulla oblongata.
  - (c) synapse within the spinal cord.
  - (d) serve only the upper extremities.
- \_\_\_\_\_ 4. The extrapyramidal tracts
- (a) originate in the cerebral cortex.
  - (b) contain reticulospinal tracts, vestibulospinal tracts, and rubrospinal tracts.
  - (c) serve only the upper extremities.
  - (d) are both motor and sensory.

#### B. True–False Questions

- \_\_\_\_\_ 1. The spinal cord ends caudally at the coccyx.
- \_\_\_\_\_ 2. The anterior median fissure and the posterior median sulcus extend the length of the spinal cord and partially divide it into right and left portions.
- \_\_\_\_\_ 3. Descending tracts of the spinal cord may originate from the cerebrum, cerebellum, mesencephalon (midbrain), or brain stem.

### XIV. Developmental Exposition of the Spinal Cord

#### A. Completion Questions

1. The spinal cord, like the brain, develops as the \_\_\_\_\_ undergoes differentiation and specialization.
2. During the development of the spinal cord, the \_\_\_\_\_ plates give rise to the posterior horns.
3. \_\_\_\_\_ cell bodies are contained in the anterior and lateral horns of the spinal cord.

## XV. Clinical Considerations

### A. True–False Questions

- \_\_\_ 1. The pressure of cerebrospinal fluid is measured with a manometer.
- \_\_\_ 2. A cerebral angiogram is used in conjunction with radiographs to reveal aneurysms and vascular constrictions or displacements by tumors.
- \_\_\_ 3. An electroencephalogram (EEG) may detect brain trauma in epileptic patients, but not seizures.
- \_\_\_ 4. A nerve block is the same as a local anesthetic.
- \_\_\_ 5. Meningitis is the most common disease of the nervous system and is the third most frequent cause of death in the United States.

### B. Matching Questions

Match the clinical term on the left with its description on the right.

- |                                 |  |
|---------------------------------|--|
| ___ 1. multiple sclerosis       | (a) trauma to the arteries of the brain                                      |
| ___ 2. tabes dorsalis           | (b) an extended state of unconsciousness                                     |
| ___ 3. syringomyelia            | (c) a defective fusion of the vertebral elements                             |
| ___ 4. cerebrovascular accident | (d) a form of neurosyphilis  |
| ___ 5. hydrocephalus            | (e) destruction of myelin sheaths  |
| ___ 6. psychosis                | (f) cystlike cavities within the gray matter of the spinal cord              |
| ___ 7. spina bifida             | (g) an abnormal accumulation of cerebrospinal fluid                          |
| ___ 8. petit mal                | (h) a withdrawal from reality  |
| ___ 9. coma                     | (i) a type of epilepsy common in children                                    |
| ___ 10. cerebral palsy          | (j) a motor disorder characterized by paresis and lack of muscle contraction |

## XVI. Chapter Review

### A. Completion Questions

- 1. The interpretation of nerve impulses is known as \_\_\_\_\_.
- 2. Numerous folds and grooves in the cerebrum and cerebellum, called \_\_\_\_\_, greatly increase the surface areas.
- 3. The \_\_\_\_\_ is the principal language area of the brain.
- 4. Brain waves are recorded in a pattern called an \_\_\_\_\_.
- 5. The crossing over of tracts of projection fibers from one side of the brain to the other is known as \_\_\_\_\_.

6. The \_\_\_\_\_ are the four rounded elevations on the superior portion of the midbrain.
7. Movements that are jerky and uncoordinated are referred to as \_\_\_\_\_ and frequently accompany cerebral palsy or a stroke.
8. The \_\_\_\_\_ is an extension of the dura mater into the longitudinal fissure.
9. The \_\_\_\_\_, located between the arachnoid and the pia mater, contains cerebrospinal fluid.
10. Metabolic changes within the brain can be assessed through the use of a \_\_\_\_\_ - \_\_\_\_\_ scan.
11. Brain function depends on the presence and delicate balance of \_\_\_\_\_ chemicals.
12. \_\_\_\_\_ are a group of neurotransmitters composed of short chains of amino acids.
13. The \_\_\_\_\_ are the nerves that splay out inferiorly from the end of the spinal cord at L1.
14. Descending tracts of white matter within the spinal cord are grouped as either \_\_\_\_\_ or \_\_\_\_\_.
15. Anesthetic drugs can render a patient unconscious, as occurs with a \_\_\_\_\_, or can desensitize a specific area, as in a \_\_\_\_\_.

## B. Matching Questions

Match the type of nervous tissue cell with its description or function.

- |                              |   |
|------------------------------|---|
| ___ 1. microglial cell       | (a) forms myelin within the PNS             |
| ___ 2. bipolar neuron        | (b) contains several dendrites and one axon |
| ___ 3. multipolar neuron     | (c) occurs in the retina                    |
| ___ 4. ganglionic gliocyte   | (d) forms the blood-brain barrier           |
| ___ 5. neurolemmocyte        | (e) functions as a sensory neuron           |
| ___ 6. pseudounipolar neuron | (f) supports ganglia                        |
| ___ 7. oligodendrocyte       | (g) phagocytizes pathogens                  |
| ___ 8. astrocyte             | (h) lines the ventricles and central canal  |
| ___ 9. ependymal cell        | (i) forms myelin within the CNS             |