10 Nervous System I Basic Structure and Function

Biol 217 Ch. 10 and Ch 11 Worksheet

Name: _____

1. The nervous system is composed of two groups of organs called the _____ nervous system and the _____ nervous system.
2. Monitoring such phenomena as light, sound, and temperature is a _____ function of the nervous system.
3. The basic unit of structure and function of the nervous system is the _____.
4. Which of the following structures is *not* common to all nerve cells?
   a. cell body
   b. axon
   c. dendrite
   d. Schwann cells
5. Does statement *a* explain statement *b*? _____
   a. The nucleus of the nerve cell seems incapable of mitosis.
   b. The nerve cell cannot reproduce.
6. The neurilemma is composed of
   a. Nissl bodies.
   b. myelin.
   c. the cytoplasm and nucleus of Schwann cells.
   d. neuron cell bodies.
7. The supporting framework of the nervous system is composed of
   a. neurons.
   b. dendrites.
   c. neuroglial cells.
   d. myelin.
8. The neuroglial cells that are able to phagocytize bacterial cells, and that increase when there is inflammation of the brain or spinal cord are
   a. astrocytes.
   b. oligodendrocytes.
   c. microglia.
   d. ependyma.
9. Which of the following are functions of the neuroglial cells?
   a. fill spaces
   b. support growth of neurons
   c. hold organs together
   d. phagocytize bacteria
10. The relative immaturity of an infant's nervous system compared to an adult's nervous system is due to
    a. fewer number of neurologic cells in an infant.
    b. fewer neurons in the infant nervous sytem compared to the adult nervous system.
    c. incomplete myelinization of the infant nervous system.
    d. poorly developed sensory receptors.
11. Which of the following injuries to nervous tissue can be repaired?
    a. damage to a cell body
    b. damage to nerve fibers that have myelin sheaths
    c. damage to nerve fibers that have a neurilemma
    d. nerve damage cannot be repaired
12. A tangled mass of regenerating nerve fibers that can be quite painful when sensory fibers are involved is called a _____.
13. Which of the following accurately reflects the order of ease with which ions pass through nerve cell membranes?
    a. potassium, sodium, calcium
    b. calcium, potassium, sodium
    c. sodium, calcium, potassium
    d. potassium, calcium, sodium
14. The difference in electrical charge between the inside and the outside of the membrane in the resting nerve cell is called the _____.
15. The effect of a new stimulus of the same type being received before the effect of the previous stimulus in a series has subsided is called _____.
16. The propagation of action potentials along a fiber is called
    a. a threshold potential.
    b. repolarization.
    c. a nerve impulse.
    d. a sensation.

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17. An action potential in a nerve fiber can be recorded with the use of a(n) _____ _____ _____ _____ .

18. The period of total depolarization of the neuron membrane when the neuron cannot respond to a second stimulus is called the _____ _____ period.

19. The refractory period acts to limit the
    a. intensity of nerve impulses.
    b. rate of conduction of nerve impulses.
    c. permeability of nerve cell membranes.
    d. responsiveness of receptor cells.

20. In which type of fiber is conduction faster?
    a. myelinated
    b. unmyelinated

21. A decrease in calcium ions below normal limits will
    a. facilitate the movement of sodium across the cell membrane.
    b. inhibit the movement of sodium across the cell membrane.
    c. facilitate the movement of potassium across the cell membrane.
    d. inhibit the movement of potassium across the cell membrane.

22. Which of the following statements best explains the ability of procaine to produce local anesthesia?
    a. Procaine binds calcium, thereby decreasing the amount of ionized calcium.
    b. Procaine decreases the membrane permeability to sodium.
    c. Procaine enhances the movement of potassium across the cell membrane.
    d. Procaine blocks release of acetylcholine.

23. The "junction" of two neurons is called a _____ .

24. The amount of neurotransmitter released at a synapse is controlled by
    a. calcium.
    b. sodium.
    c. potassium.
    d. magnesium.

25. Continuous stimulation of a neuron on the distal side of this junction is prevented by
    a. exhaustion of the nerve fiber.
    b. the chemical instability of neurotransmitters.
    c. enzymes within the neural junction.
    d. rapid depletion of ionized calcium.

26. A pair of neuropeptides that are synthesized by the brain and spinal cord in response to pain are _____ .

27. If a neuron receives a subthreshold stimulus, which renders it more likely to respond to incoming excitatory stimulation than before, it is said to be _____ .

28. The process that allows coordination of incoming impulses that represent information from a variety of receptors is called _____ .

29. The most common neuron structure is one
    a. axon and many dendrites.
    b. process that serves as both axon and dendrite.
    c. dendrite and many axons.
    d. dendrite and one axon.

30. Unipolar neurons are found in
    a. brain.
    b. spinal cord.
    c. special sense organs.
    d. ganglia.

31. Neurons may be classified functionally as _____ , _____ , and _____ neurons.

32. Nerve fibers that carry motor impulses from the brain and spinal cord to skeletal muscle to cause them to contract are _____ fibers.
    a. general somatic efferent
    b. general somatic afferent
    c. general visceral efferent
    d. general visceral afferent

33. The simplest of the nerve pathways is a _____ _____ .

34. Damage to the corticospinal tract may result in a/an _____ reflex.
    a. biceps-jerk
    b. cremasteric
    c. ankle-jerk
    d. Babinski

PART I. MULTIPLE CHOICE

_____ 1. The portion of a neuron that conducts impulses away from the cell body is the (a) dendrite (b) axon (c) receptor (d) effector

_____ 2. The fine branching filaments of an axon are called (a) myelin sheaths (b) axolemmas (c) telodendria (d) axon hillocks

_____ 3. The component of a reflex arc that responds to a motor impulse is the (a) center (b) receptor (c) sensory neuron (d) effector

_____ 4. Which type of neuron conducts impulses toward the central nervous system? (a) afferent (b) association (c) internuncial (d) efferent

_____ 5. In a reflex arc, the impulse is transmitted directly to the effector by the (a) sensory neuron (b) motor neuron (c) center (d) receptor

_____ 6. Bulblike structures at the distal ends of telodendria that contain storage sacs for neurotransmitters are called (a) dendrites (b) synaptic end bulbs (c) axon collaterals (d) neurofibrils

_____ 7. Which neuroglial cell is phagocytic? (a) oligodendrocyte (b) protoplasmic astrocyte (c) microglial cell (d) fibrous astrocyte

PART II. COMPLETION

8. A neuron that contains several dendrites and one axon is classified as _____.

9. The portion of a neuron that contains the nucleus and cytoplasm is the _____.

10. The phospholipid covering around many peripheral axons is called the _____.

11. The two types of cells that compose the nervous system are neurons and _____.

12. The peripheral, nucleated layer of the neurolemmocyte (Schwann cell) that encloses the myelin sheath is the _____.

13. The side branch of an axon is referred to as the _____.

14. The part of a neuron that conducts impulses toward the cell body is the _____.

15. Neurons that carry impulses between sensory neurons and motor neurons are called _____ neurons.

16. Neurons with one dendrite and one axon are classified as _____.

17. Unmyelinated gaps between segments of the myelin sheath are known as _____.

18. The neuroglial cell that produces a myelin sheath around axons of neurons of the central nervous system is called a(n) _____.

19. In a reflex arc, the muscle or gland that responds to a motor impulse is called the _____.

11 Nervous System II
Divisions of the Nervous System

Name: _____

1. The organs of the central nervous system are the _____ and the _____ _____.

2. The outer membrane covering the brain is composed of fibrous connective tissues and is called the
   a. dura mater.
   b. arachnoid mater.
   c. pia mater.
   d. periosteum.

3. A collection of blood under the dura mater secondary to injury to the head is a _____ _____.

4. Cerebrospinal fluid is found between the
   a. arachnoid mater and the dura mater.
   b. vertebrae and the meninges.
   c. pia mater and the arachnoid mater.

5. Meningitis is most likely to involve inflammation of the
   a. dura mater.
   b. arachnoid mater.
   c. pia mater.

6. The spinal cord ends
   a. at the sacrum.
   b. between thoracic vertebrae 11 and 12.
   c. between lumbar vertebrae 1 and 2.
   d. at lumbar vertebra 5.

7. There are _____ pairs of spinal nerves.

8. Which of the following statements is/are true about the white matter in the spinal cord?
   a. A cross section of the cord reveals a core of white matter surrounded by gray matter.
   b. The white matter is composed of myelinated nerve fibers and makes up nerve pathways, called tracts.
   c. The white matter carries sensory stimuli to the brain; the gray matter carries motor stimuli to the periphery.
   d. The nerve fibers within spinal tracts arise from cell bodies located in the same part of the nervous system.

9. A cordotomy involves severing the _____ tract to relieve _____.

10. An individual with injury to the spinocerebellar tract is likely to experience
    a. loss of a sense of touch.
    b. uncoordinated movements.
    c. involuntary muscle movements.
    d. severely diminished pain perception.

11. An individual suffering from spastic paralysis has most likely sustained damage to the _____ tract.
    a. spinocerebellar
    b. corticospinal
    c. ribrospinal
    d. reticulospinal

12. The cerebrum develops from a portion of the
    a. forebrain (prosencephalon).
    b. midbrain (mesencephalon).
    c. hindbrain (rhombencephalon).

13. The three major portions of the brain are the _____, _____, and _____ _____.

14. A neural tube defect in the posterior portion of the tube results in _____ _____.

15. The hemispheres of the cerebrum are connected by nerve fibers called the
    a. corpus callosum.
    b. falx cerebri.
    c. fissure of Rolando.
    d. tentorium.

16. Which of the following statements about the cerebral cortex are true?
    a. The cortex is the central white portion of the cerebrum.
    b. The cortex has sensory, motor, and association areas.
    c. The cortex is the outer gray area of the cerebrum.
    d. The cells in the right hemisphere of the cortex control the right side of the body.

17. Match the functions in the first column with the appropriate area of the brain in the second column.

_____ 1. hearing	a. frontal lobes
_____ 2. vision	b. parietal lobes
_____ 3. recognition of printed words	c. temporal lobes
_____ 4. control of voluntary muscles	d. occipital lobes
_____ 5. pain	
_____ 6. complex problem solving	

18. Damage to Broca's area in the cerebral cortex results in the inability to _____ .

19. Centers for higher intellectual functions, such as planning and complex problem solving, are located in the _____ lobes.

20. Damage to the parietal lobes would impair an individual's ability to
    a. hear speech.
    b. understand speech.
    c. choose appropriate words in speaking.
    d. understand visual cues.

21. In most people, the _____ hemisphere is dominant for verbal and computational skills.

22. Some investigators believe that intense, repetitive neuronal activity produces stable changes in nerve pathways to produce _____ memory.
    a. short-term
    b. long-term
    c. collective
    d. unconscious

23. A brief interruption of blood flow to the brain produces a condition known as a _____ _____ _____ .

24. The function of basal ganglia is to
    a. inhibit emotional responses.
    b. inhibit motor functions.
    c. aid in temperature control.
    d. integrate hormonal function.

25. Cerebrospinal fluid is produced by the _____ _____ .

26. The major function of cerebrospinal fluid is to
    a. supply glucose to the innermost parts of the brain.
    b. prevent injury by acting as a shock absorber.
    c. maintain the electrolyte balance of the cerebrum.
    d. maintain temperature equilibrium in the brain stem.

27. Which of the following are limiting factors in the delivery of drugs intrathecally?
    a. the volume of drug delivered
    b. the pharmacologic activity of the drug
    c. difficulties in accessing the subarachnoid space
    d. monitoring the concentration of drug in solution

28. An infant who has increasing pressure in the ventricles is said to have _____ .

29. The thalamus, hypothalamus, optic chiasma, and pituitary gland are parts of the brain located in the
    a. midbrain.
    b. pons.
    c. medulla oblongata.
    d. diencephalon.

30. The relay station that receives all sensory impulses except smell is the
    a. pons.
    b. medulla.
    c. basal ganglia.
    d. thalamus.

31. The part of the brain responsible for regulation of temperature and heart rates, control of hunger, and regulation of fluid and electrolytes is the
    a. thalamus.
    b. hypothalamus.
    c. medulla oblongata.
    d. pons.

32. The _____ _____ produces emotional reactions of fear, anger, and pleasure.

33. The red nucleus of the midbrain is the center for
    a. color vision.
    b. eye reflexes.
    c. postural reflexes.
    d. temperature control.

34. The area of the brain that contains control centers for vital visceral functions is the _____ _____ .

35. Consciousness is dependent on stimulation of the _____ _____ .

36. With the eyes closed, a person can accurately describe the positions of the various body parts. Which of the following structures serve in this function?
    a. proprioceptors
    b. pons
    c. frontal lobe of the cerebrum
    d. cerebellum

37. An individual who sustains damage to the cerebellum is likely to exhibit
    a. tremors.
    b. garbled speech.
    c. bizarre thought patterns.
    d. a loss of peripheral vision.

38. The peripheral nervous system has two divisions, the _____ nervous system and the _____ nervous system.

39. There are _____ pairs of cranial nerves; all but one pair of these arise from the _____ _____ .

40. The cranial nerve that raises the eyelid and focuses the lens of the eye is the
    a. optic nerve.
    b. oculomotor nerve.
    c. abducens nerve.
    d. facial nerve.

41. In shrugging the shoulders, the sternocleidomastoid and trapezius muscles are being stimulated by
    a. the vagus nerve.
    b. the trigeminal nerve.
    c. the accessory nerve.
    d. the hypoglossal nerve.

42. The anterior branches at the lower four cervical nerves and the first thoracic nerve give rise to the _____ plexus.

43. Which of the following nerves arises from the lumbosacral plexus?
    a. musculocutaneous nerve
    b. femoral nerve
    c. common peroneal nerve
    d. medial nerve

44. The part of the nervous system that functions without conscious control is the _____ nervous system.

45. Nerves of the sympathetic division leave the spinal cord with spinal nerves in the _____ and _____ .

46. Nerves of the parasympathetic division leave the central nervous system within _____ nerves and _____ nerves.

47. Match the parts in the first column with the appropriate division in the second column.

    _____ 1. adrenergic fibers
    _____ 2. cholinergic fibers
    _____ 3. norepinephrine
    _____ 4. acetylcholine

    a. sympathetic division
    b. parasympathetic division preganglionic
    c. parasympathetic postganglionic

48. Which of the following are responses to stimulation by the sympathetic nervous system?
    a. increased heart rate
    b. increased blood glucose concentration
    c. increased peristalsis
    d. increased salivation

49. Which of the following are responses to stimulation of the parasympathetic nervous system?
    a. dilation of the bronchioles
    b. dilation of the coronary arteries
    c. contraction of the gallbladder
    d. contraction of the muscles of the urinary bladder

PART I. MULTIPLE CHOICE

_____ 1. The tapered, conical portion of the spinal cord is the (a) filum terminale (b) conus medullaris (c) cauda equina (d) lumbar enlargement

_____ 2. The outermost meninx composed of dense fibrous connective tissue is the (a) pia mater (b) arachnoid (c) dura mater (d) denticulate

_____ 3. The portion of a spinal nerve that contains motor nerve fibers only is the (a) posterior root (b) posterior root ganglion (c) lateral root (d) anterior root

_____ 4. The connective tissue covering around individual nerve fibers is the (a) endoneurium (b) epineurium (c) perineurium (d) ectoneurium

_____ 5. On the basis of organization, which does *not* belong with the others? (a) pons (b) medulla (c) thalamus (d) midbrain

_____ 6. The lateral ventricles are connected to the third ventricle by the (a) interventricular foramen (b) cerebral aqueduct (c) median aperture (d) lateral aperture

_____ 7. The vital centers for heartbeat, respiration, and blood vessel diameter regulation are found in the (a) pons (b) cerebrum (c) cerebellum (d) medulla

_____ 8. The reflex centers for movements of the head and trunk in response to auditory stimuli are located in the (a) inferior colliculi (b) medial geniculate nucleus (c) superior colliculi (d) ventral posterior nucleus

_____ 9. Which thalamic nucleus controls general sensations and taste? (a) medial geniculate (b) ventral posterior (c) ventral lateral (d) ventral anterior

_____ 10. Integration of the autonomic nervous system, secretion of regulating factors, control of body temperature, and the regulation of food intake and thirst are functions of the (a) pons (b) thalamus (c) cerebrum (d) hypothalamus

_____ 11. The left and right cerebral hemispheres are separated from each other by the (a) central sulcus (b) transverse fissure (c) longitudinal fissure (d) insula

_____ 12. Which structure does *not* belong with the others? (a) putamen (b) caudate nucleus (c) insula (d) globus pallidus

_____ 13. Which peduncles connect the cerebellum with the midbrain? (a) superior (b) inferior (c) middle (d) lateral

_____ 14. Which cranial nerve has the most anterior origin? (a) XI (b) IX (c) VII (d) IV

_____ 15. Extensions of the pia mater that suspend the spinal cord and protect against shock are the (a) choroid plexuses (b) pyramids (c) denticulate ligaments (d) superior colliculi

_____ 16. Which branch of a spinal nerve enters into formation of plexuses? (a) meningeal (b) dorsal (c) rami communicantes (d) ventral

_____ 17. Which plexus innervates the upper extremities and shoulders? (a) sacral (b) brachial (c) lumbar (d) cervical

_____ 18. How many pairs of thoracic spinal nerves are there? (a) 1 (b) 5 (c) 7 (d) 12

PART II. COMPLETION

19. The narrow, shallow groove on the posterior surface of the spinal cord is the _____.

20. The space between the dura mater and wall of the vertebral canal is called the _____.

21. In a spinal nerve, the cell bodies of sensory neurons are found in the _____.

22. The outermost connective tissue covering around a spinal nerve is the _____.

23. The middle meninx is referred to as the _____.

24. The nuclei of origin for cranial nerves IX, X, XI, and XII are found in the _____.

25. The portion of the brain containing the cerebral peduncles is the _____.

26. Cranial nerves V, VI, VII, and VIII have their nuclei of origin in the _____.

27. A shallow downfold of the cerebral cortex is called a(n) _____.

28. The _____ separates the frontal lobe of the cerebrum from the parietal lobe.

29. White matter tracts of the cerebellum are called _____.

30. The space between the dura mater and arachnoid is referred to as the _____.

31. Together, the thalamus, hypothalamus, and pineal gland are called the _____.

32. Cerebrospinal fluid passes from the third ventricle into the fourth ventricle through the _____.

33. The cerebrum is separated from the cerebellum by the _____ fissure.

34. The branches of a spinal nerve that are components of the autonomic nervous system are known as _____.

35. The plexus that innervates the buttocks, perineum, and lower extremities is the _____ plexus.

36. There are _____ pairs of spinal nerves.

37. Together, the brain and spinal cord are referred to as the _____ nervous system.

38. The cell bodies of _____ neurons of the ANS are found inside autonomic ganglia.

39. The portion of the ANS concerned with the fight-or-flight response is the _____ division.

40. The autonomic ganglia that are anterior to the vertebral column and close to large abdominal arteries are called _____ ganglia.