

NERVE 1 NERVE TISSUE, EXCITABILITY, CONDUCTIVITY, SPINAL CORD & REFLEXES

DIRECTIONS: Read the questions carefully and pick the **BEST CORRECT ANSWER**. Then check your answer against the correct answers on the Key at the bottom of the page. Good luck.

1. Dendrites:

- A. carry efferent impulses
- B. are generally long and unbranched
- C. form synapses with the dendrites of neighboring neurons
- D. do not respond to neurotransmitter substances
- E. do not normally conduct true action potentials

2. Which of the following is NOT a vital or inborn reflex?

- A. Change in blood pressure due to shock
- B. Increased heart rate due to loss of blood
- C. Decreased respiratory rate during resting
- D. Thinking about the answer to this question
- E. Vomiting at the thought of taking this course over again

3. Which of the following statements is/are CORRECT?

- A. A reflex always starts at a sensory neuron and ends at a motor neuron
- B. The brain is the functional unit of the nervous system
- C. Effector organs are non-neural structures
- D. When a tack pricks the toe of a barefoot person, the tack is the stimulus
- E. All of the above

4. Which of the following is/are TRUE?

- A. Graded potentials are generated only at the dendrites or cell body of neurons
- B. Action potentials can only be generated in the axon hillock or axon of neurons
- C. Both A and B
- D. Neither A nor B

5. Reflex arcs:

- A. are the basic structural units of the nervous system
- B. are the smallest, simplest units of the nervous system capable of receiving a stimulus and producing a response
- C. require conscious thought for their initiation
- D. are usually composed of one or two, maybe three neurons
- E. two of the above

6. The sodium-potassium pump is used to:

- A. get sodium ions from inside of the cell to outside so as to reconstitute the resting potential
- B. move potassium ions to the inside of the cell to re-establish the resting polarity
- C. both A and B
- D. neither A nor B

7. The period of time during which a cell membrane is completely insensitive to another stimulus is the:

- A. threshold principle.
- B. after-potential period.
- C. absolute refractory period.
- D. relative refractory period.
- E. non-accommodation period.

8. Which of the following is NOT a visceral effector organ?

- A. Deltoid muscle
- B. Cardiac muscle
- C. Smooth muscle of blood vessels
- D. Stomach
- E. Urinary bladder

9. In which one of the following would the nerve impulses probably cross the "smallest" number synapses?

- A. Sneezing after sniffing some irritating substance
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 - C. Solving a mathematics problem
 - D. Batting a pitched ball into a 10 foot area which is 200 feet from home
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10. Which of the following would be considered reflex activities?

- A. Inching a mosquito bite on your upper arm
- B. Writing notes during an anatomy lecture
- C. Belching while eating Jerry's pizza

D. Yawning on a blind date

E. All of the above

11. Nerve impulses are termed:

- A. efferent if they pass toward the cell body.
- B. afferent if they pass toward the central nervous system.
- C. reflexes when they pass back along the same pathway they follow in entering the cell body.
- D. afferent if they pass both toward and away from the cell body.
- E. afferent if they pass along a neuron away from the cell body.

12. During an action potential, repolarization begins as a result of:

- A. potassium ions diffusing to the outside of the cell membrane.
- B. potassium ions diffusing to the inside of the cell membrane.
- C. sodium ions diffusing to the outside of the cell membrane.
- D. sodium ions diffusing to the inside of the cell membrane.

13. Which of the following is/are TRUE?

- A. Neurons demonstrate irritability and conductivity, and can transmit electrical messages from one area of the body to another.
- B. neuroglia release neurotransmitters to other neuroglia.
- C. Both A and B
- D. Neither A nor B

14. Which of these would be considered a coordinated type of complex reflex?

- A. Ducking your head when a golfer hollers "fore!"
- B. Running between puddles in the parking lot to get to your car
- C. Writing your lecture notes so you can read them later
- D. All of the above
- E. None of the above

15. Which answer is out of order in a reflex arc? note: answer A is correct.

- A. Conduction of sensory information from somatic and visceral receptors to the spinal cord.
- B. Conduction from sensory neurons in gray H to sensory neurons in lower parts of the spinal cord.
- C. Both A and B
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16. The sense of knowing the action occurring over a joint at any one time is acquired through the action of:

- A. pain.
- B. touch.
- C. pressure.
- D. proprioception.
- E. None of the above

17. Which of the following is not necessary for the performance of spinal reflexes?

- A. Effectors
- B. Synapses
- C. Receptors

D. Peripheral nerves

E. Medulla oblongata

18. Which of the following is/are TRUE

- A. The axon of a motor neuron extends from the cell body to another neuron or an effector organ.
- B. A neuron usually has many axons, connected to other neurons.
- C. Sensory and motor neurons have dendrites; connector neurons do not.
- D. The dendrite of one neuron connects with a dendrite of the next neuron.
- E. All of the Above

19. Which of the following is NOT a sensory tract?

- A. Spinothalamic tract
- B. Spinocerebellar tract
- C. Corticospinal tract
- D. All of the above
- E. A and B only

20. The subdural space is that potential space which:

- A. contains a large amount of cerebrospinal fluid.
- B. is located between the dura mater and arachnoid.
- C. is located between the cranial bones and the outer surfaces of the dura.
- D. is found only in the caudal region of the spinal cord.
- E. is found in none of the above regions.

21. The route or pathway of information to a reflex center, or the pathway from a receptor to an integrator, describes a(an)

- A. motor nerve.
- B. motor neuron.
- C. efferent pathway.
- D. afferent pathway.
- E. lowest sensory neuron.

22. The spinal cord

- A. is lodged within the spinal cavity of the vertebral column.
- B. is the major reflex center for spinal reflexes.
- C. is the important center of reflex action for the upper and lower limbs.
- D. consists of the principal conducting paths to and from the higher centers in the brain.
- E. All of the above

23. Which of these describe(s) the meninges?

- A. The dura mater is the outermost membrane and is a sheath of dense fibrous and elastic tissue.
- B. The arachnoid membrane is a delicate web-like membrane between the dura and pia.
- C. The pia is the innermost meninge, with a thin membrane that directly covers the CNS.
- D. The central canal is a tiny tube within the spinal cord.
- E. All of the above

24. Which of the following CORRECTLY pertains to spinal nerves?

- A. They contain sensory neurons only.
- B. They arise from the base of the brain and travel down and inside the spinal canal.
- C. Each arises from the spinal cord by a dorsal and ventral root.

- D. These are the nerves going to the organs of the thoracic and abdominal cavities.

- E. None of the above

25. Cerebrospinal fluid is found between the:

- A. vertebrae and the meninges.
- B. arachnoid and the dura mater.
- C. pia mater and the cortical brain tissue.
- D. pia matter and arachnoid.
- E. None of the above

26. Meninges are:

- A. epithelial membranes around connective tissue.
- B. origins of broad flat muscles.
- C. cortical areas of the brain.
- D. brain and spinal cord coverings.
- E. hollow places in the brain

27. Which of the following cell types can produce action potentials when stimulated?

- 1. Smooth muscle cells
- 2. Skeletal muscle cells
- 3. Axon hillocks of neurons
- 4. Neuroglia
- 5. Astrocytes

A. 3 only

B. 3 and 5

- C. 2, 3, and 5
- D. gray color and increased rate of impulse transmission.
- D. 1, 2, 3, and 5
- E. 1, 2, 3, 4, and 5
32. Which of these answers does NOT belong with the others?
- A. Nodes of Ranvier
- B. Myelin sheath
- C. Unmyelinated
- D. Saltatory conduction
28. Ependymal cells
- A. are sometimes called neurolemmocytes.
- B. form sheaths around parasympathetic nervous tissue cells.
- C. are phagocytes of the neuroglia.
- D. form sheaths around central nervous system cells.
- E. have cilia, and line the ventricles of the brain.
33. The period during which potassium ions move into the cell is called (the):
- A. depolarization period.
- B. relative refractory period.
- C. absolute refractory period.
- D. period of sodium/potassium pump activity.
- E. None of the above
29. When a neuron is "resting", the inner surface of its cell membrane is slightly positive compared to its outer surface.
- A. True
- B. False
30. Which term does NOT belong with the other answers?
- A. K⁺ enters the cell
- B. K⁺ leaves the cell
- C. Na⁺ leaves the cell
- D. Depolarization
34. Which of these statements is first out of order concerning the basic functions of the nervous system? note: answer A is correct.
- A. Conversion of stimuli to nerve impulses in receptor organs
- B. CNS sorts out or integrates incoming nerve impulses.
- C. Conduction of nerve impulses via sensory nerves to spinal cord and/or brain.
- D. CNS interprets nerve impulses.
- E. CNS routes nerve impulses to effector organs, i.e., muscles, and/or glands, via motor or efferent nerves.
31. The presence of myelin gives a nerve fiber its"
- A. gray color and regenerative abilities.
- B. white color and increased rate of impulse transmission.
- C. white color and decreased rate of impulse transmission.
35. The involuntary part of the nervous system that sends impulses over efferent fibers to smooth muscle of

internal organs, blood vessels, and exocrine glands, is the:

- A. peripheral nervous system.
- B. central nervous system.
- C. cerebrum nervous system.
- D. autonomic nervous system.
- E. social security system.

D. regeneration.

E. None of the above

36. An axon hillock produces either a complete action potential or no action potential at all.

- A. True
- B. False

37. Saltatory conduction reduces the energy expenditure of the sodium-potassium pump required for impulse production transmission.

- A. True
- B. False

38. Nerve impulses travel faster in myelinated than in non-myelinated nerves because of the presence of --?-- in the former.

- A. saltatory conduction
- B. a fatty insulation
- C. Both A and B
- D. Neither A nor B

39. Nerve impulses "hop" from node to node in the process known as

- A. negative feedback.
- B. saltatory conduction.
- C. the all or none principle.

40. --?-- are concentrations of nerve cell bodies in clusters adjacent to the spinal cord but outside of the vertebral column.

- A. Nuclei
- B. Nerves
- C. Plexi
- D. Glia
- E. Sympathetic ganglia

41. What activities may result from impulses conducted by motor neurons?

- A. Glandular secretion or interpretation of stimuli.
- B. Interpretation of stimuli related to associative memory.
- C. Glandular secretion or muscle contraction.
- D. memory, reasoning and muscle contraction.

42. Which of the following is/are "true"?

- A. Interneurons (association neurons) lie outside of the central nervous system.
- B. Efferent neurons that innervate skeletal muscle are also called motor neurons.
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43. The neurilemma:

- A. is a continuous sheath that encloses the segmented myelin sheath of peripheral nerve fibers.
- B. acts as the cell membrane for the Schwann cells.

- C. is used for regeneration of injured peripheral nerve fibers.
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44. Which class of neurons accounts for 95% of all nerve cells?
- A. Afferent neurons
 - B. Efferent neurons
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45. Which of these is/are "TRUE"?
- A. Myelin is a proteinaceous or protein-like material.
 - B. Saltatory conduction in nonmyelinated neurons is faster than in myelinated neurons.
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46. Which of these is only in the peripheral nervous system?
- A. Astrocytes
 - B. Oligodendroglia
 - C. Schwann cells
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47. Which of the following is/are NOT true of axons?
- A. They are usually long, cytoplasmic processes carrying impulses away from the cell body.
 - B. In the peripheral nervous system, they are covered by three types of coverings--axolemma, myelin sheath and neurilemma.
 - C. They contain nissl bodies
- D. They contain many neurofibrils
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48. Part of the structure of "every" type of neuron is:
- A. a myelin sheath.
 - B. a neurilemma.
 - C. a motor end plate.
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49. Which of the following IS/ARE a function of the nervous system?
- A. It senses changes within the body and in the outside environment.
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 - E. Two of the above
50. ATP is important for a neuron so that,
- A. the Na⁺/K⁺ pump can operate.
 - B. neurotransmitters can be synthesized.
 - C. regeneration of CNS neurons can take place.
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NERVOUS SYSTEM 1 ANSWERS

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- C. It may initiate a response to a stimulus.
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- E. Two of the above

46. Which of these is only in the peripheral nervous system?

- A. Astrocytes
- B. Oligodendroglia
- C. Schwann cells**
- D. Microglia

50. ATP is important for a neuron so that,

- A. the Na⁺/K⁺ pump can operate.
- B. neurotransmitters can be synthesized.
- C. regeneration of CNS neurons can take place.
- D. A and B only**
- E. B and C only

47. Which of the following is/are NOT true of axons?

- A. They are usually long, cytoplasmic processes carrying impulses away from the cell body.
- B. In the peripheral nervous system, they are covered by three types of coverings--axolemma, myelin sheath and neurilemma.
- C. They contain nissl bodies**
- D. They contain many neurofibrils
- E. All of the above

48. Part of the structure of "every" type of neuron is:

- A. a myelin sheath.
- B. a neurilemma.

Part2

NERVE 2 NERVE TISSUE, EXCITABILITY, CONDUCTIVITY, SPINAL CORD & REFLEXES

DIRECTIONS: Read the questions carefully and pick the **BEST CORRECT ANSWER**. Then check your answer against the correct answers on the Key at the bottom of the page. Good luck.

1. The minimum number of neurons that may be involved in the simplest reflex is:

- A. 1
- B. 2
- C. 3

4. 4
- C. arachnoid.
5. any number less than infinity
- D. cauda equina.
- E. none of the above
2. Sensory is to --?-- as --?-- is to efferent.
- A. efferent; motor
- B. afferent; sensory
- C. afferent; motor
- D. motor; central
- E. none of the above are true
6. Unlike continuous conduction, saltatory conduction
- A. is a slower means of impulse transmission.
- B. requires more energy.
- C. is characteristic of unmyelinated neurons.
- D. does not have a refractory period.
- E. none of the above
3. Which one of the following functions of neuroglial cells is NOT correct?
- A. Carry nerve impulses
- B. Help create cerebrospinal fluid
- C. Assist in attaching neurons to capillaries
- D. Phagocytosis
- E. some make myelin
7. The inferior end of the spinal cord is:
- A. at L-4.
- B. in the shape of a horse.
- C. tapered in the shape of a cone.
- D. at the sacrum.
- E. All of the above are true
4. The connective tissue wrapping around each fiber of a nerve is called:
- A. perimysium.
- B. epineurium.
- C. periosteum.
- D. endoneurium.
- E. epimysium.
8. In considering a typical 2-neuron spinal reflex arc,
- A. the incoming (sensory) impulses enter the spinal cord through the ventral root of the spinal nerve.
- B. the sensory fibers have their cells of origin located in the brain.
- C. all the nerve fibers involved are un-myelinated.
- D. the sensory neuron involved has its cell body located in the dorsal root ganglion.
- E. synaptic connections are made across the spinal cord to neurons on the opposite side.
5. The most superficial of the meninges is called the:
- A. pia mater.
- B. dura mater.
9. The dorsal root ganglion contains

A. cell bodies of motor neurons.

B. cell bodies of sensory neurons.

C. cranial nerve axons.

D. synapses.

E. all of the above

B. nerves.

C. axons.

D. dendrites.

E. tracts.

10. Which fibers, if cut, are capable of regeneration because of the presence of a neurilemma around the fibers:

1. Those in the femoral nerve, a peripheral nerve.
2. Those in the association areas of the brain.
3. Those in the spinothalamic tract of the spinal cord.

-
- A. 1 only
 - B. 2 only
 - C. 3 only
 - D. none of the above
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11. Dendrites of a neuron

- A. are always covered with a neurilemma (sheath of Schwann)
- B. conduct graded potentials toward the cell body.
- C. secrete acetylcholine and/or norepinephrine.
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12. Gray matter is composed mostly of:

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15. The dorsal root of the spinal nerve has been severed. What theoretical effect would you expect to see in such a patient?

- A. The individual would not be able to feel anything in the affected area.
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4. sub arachnoid space

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Which order of the structures listed above, is most correct in describing the bullet's pathway

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1. dendrite
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4. telodendria
5. terminal end bulb, or button

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D. 2, 1, 5, 4, 3, 6

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Choose the arrangement which lists the structures over which an action potential would travel.

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49. What is primarily responsible for restoring the resting potential in milliseconds following depolarization?

- A. The membrane becomes relatively impermeable to sodium ions.
- B. There is a rapid net diffusion of potassium ions to the exterior of the cells.

C. The sodium-potassium active transport pump begins functioning again.

D. A and B above.

E. B and C above.

3. Which one of the following functions of neuroglial cells is NOT correct?

A. Carry nerve impulses

B. Help create cerebrospinal fluid

C. Assist in attaching neurons to capillaries

D. Phagocytosis

E. some make myelin

50. The membrane of a neuron that is not conducting an impulse is said to:

A. have an action potential.

B. be depolarized.

C. be undergoing repolarization.

D. have a resting potential.

E. be more negative on its outside edge.

4. The connective tissue wrapping around each fiber of a nerve is called:

A. perimysium.

B. epineurium.

C. periosteum.

D. endoneurium.

E. epimysium.

NERVOUS SYSTEM 2 ANSWERS

1. The minimum number of neurons that may be involved in the simplest reflex is:

A. 1

B. 2

C. 3

4. 4

5. any number

5. The most superficial of the meninges is called the:

A. pia mater.

B. dura mater.

C. arachnoid.

D. cauda equina.

E. none of the above

2. Sensory is to --?-- as --?-- is to efferent.

A. efferent; motor

B. afferent; sensory

C. afferent; motor

D. motor; central

E. none of the above are true

6. Unlike continuous conduction, saltatory conduction

A. is a slower means of impulse transmission.

B. requires more energy.

C. is characteristic of unmyelinated neurons.

D. does not have a refractory period.

E. none of the above

7. The inferior end of the spinal cord is:

- A. at L-4.
- B. in the shape of a horse.
- C. tapered in the shape of a cone.**
- D. at the sacrum.
- E. All of the above are true

3. Those in the spinothalamic tract of the spinal cord.

8. In considering a typical 2-neuron spinal reflex arc,

- A. the incoming (sensory) impulses enter the spinal cord through the ventral root of the spinal nerve.
- B. the sensory fibers have their cells of origin located in the brain.
- C. all the nerve fibers involved are un-myelinated.
- D. the sensory neuron involved has its cell body located in the dorsal root ganglion.**
- E. synaptic connections are made across the spinal cord to neurons on the opposite side.

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- B. cell bodies of sensory neurons.**
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Part 3

NERVE 3 NERVE TISSUE, EXCITABILITY, CONDUCTIVITY, SPINAL CORD & REFLEXES

DIRECTIONS: Read the questions carefully and pick the BEST CORRECT ANSWER. Then check your answer against the correct answers on the Key at the bottom of the page. Good luck.

1. When a neuron is at rest, the inside of the cell contains more than .

A. K+; Na+.

B. Ca++; Na+.

C. Na+; K+.

D. Fe++; Fe+++.

E. Na+; Ca++.

2. The connective tissue wrapping around an entire nerve is called:

A. perimysium

B. epineurium

C. perineurium

D. endoneurium

E. epimysium

3. Neuroglia cells in the CNS are responsible for all except which one of the following:

- A. phagocytosis of cellular debris.
- B. myelination of axons.
- C. neural regeneration.
- D. provide neural support.

4. A neural impulse will proceed through a neuron in what anatomical sequence once a receptor is stimulated:

- A. cell body to axon to dendrite.
- B. axon to dendrite to cell body.
- C. dendrite to axon to cell body.
- D. dendrite to cell body to axon.

5. A motor nerve consists of:

- A. dendrites.
- B. axons.
- C. cell bodies.
- D. All of the above.
- E. None of the above.

6. The Na/K pump:

- A. maintains the ionic concentration gradient across the resting neuron.
- B. is briefly discontinued during depolarization.
- C. is responsible for repolarization.
- D. All of the above.
- E. None of the above.

7. Arrange the following events in the correct order of occurrence. An action potential involves:

- 1. increased K⁺ permeability; decreased Na⁺ permeability.
- 2. resting membrane potential reestablished.
- 3. threshold stimulus applied.
- 4. increased Na⁺ permeability.
- 5. K⁺ moves out.
- 6. Na⁺ moves into cell
- 7. depolarization occurs.
- 8. repolarization occurs.

The correct sequence is:

- A. 3,7,8,4,5,1,6,2
- B. 5,8,1,2,6,3,4,7
- C. 1,2,7,3,5,8,4,6
- D. 8,6,4,3,2,1,5,7
- E. 3,4,6,7,1,5,8,2

8. Neuronal cell bodies are located in the CNS within:

- A. nerves.
- B. tracts.
- C. gray matter.
- D. ganglia.

9. If a neuron were experimentally placed in conditions where intracellular potassium were depleted, which of the following is a logical consequence?

- A. the neuron would hyper polarize.
- B. the intracellular charge would become more positive.
- C. the neuron would fire spontaneously.

D. all of the above.

E. none of the above.

10. If a motor neuron in the body were stimulated by an electrode placed about midpoint along the length of the axon:

- A. the impulse would move to the motor end plate (synaptic bulb).
- B. sensory discrimination would occur.
- C. the impulse would spread to the dendrite and across the neuronal synapse.
- D. the membrane would become hyper polarized.
- E. nothing would happen.

11. Cell bodies of sensory neurons of spinal nerves are located in:

- A. dorsal horn of gray matter.
- B. ventral root.
- C. dorsal root ganglion.
- D. dorsal white column.
- E. central canal.

12. The white matter in the spinal cord:

- A. is composed of myelinated fibers.
- B. ascends to higher CNS centers.
- C. descends to lower levels.
- D. can be found around the perimeter of the gray "H".
- E. all of the above are correct.

13. A reflex center is:

- A. in the CNS.

B. a synaptic site.

C. a location for motor neuron cell bodies.

D. all of the above.

E. none of the above.

14. Cutting a ventral root of the spinal cord would lead to:

- A. loss of sensory perception at that cord level.
- B. loss of reflexes at that cord level.
- C. both of the above.
- D. none of the above.

15. Cutting a spinal nerve would lead to:

- A. loss of sensory perception.
- B. loss of reflex activity.
- C. loss of voluntary muscle response.
- D. all of the above.
- E. none of the above.

16. Which is longer?

- A. the dendrite of a peripheral sensory neuron.
- B. the dendrite of a somatic motor neuron.
- C. both dendrites are the same length.

17. Dorsal root ganglia:

- A. contain fibers of motor neurons.
- B. are the site of sensory neuron cell bodies.
- C. both of the above.
- D. none of the above.

D. None of the above.

18. Which of the following is not necessary for the performance of the withdrawal reflex:

- A. Effectors (muscle fibers).
- B. Synapses.
- C. Receptors.
- D. Peripheral nerves.
- E. Cerebral cortex.

21. Neuro-transmitters are released at:

- A. receptor sites.
- B. post-synaptic membranes.
- C. synaptic bulb of neuron.
- D. All of the above.
- E. None of the above.

19. What is the correct sequence that structures are involved in a spinal reflex?

- 1. Dorsal root ganglion
- 2. Motor neuron axon
- 3. Cutaneous receptor
- 4. Synapse between neurons
- 5. Sensory neuron dendrite
- 6. Motor neuron cell body
- 7. Motor neuron synaptic bulb

22. The spinal cord ends at the level of:

- A. L1
- B. L3
- C. S1
- D. S3
- E. T10

23. Severing the spinal cord at what level would result in cardiac arrest?

- A. C2
- B. C3
- C. C5
- D. T1
- E. None of the above

The correct sequence is:

- A. 5,6,1,2,4,7,3
- B. 3,5,1,4,6,2,7
- C. 3,4,1,2,5,6,7
- D. 5,3,4,2,1,6,7
- E. 7,4,5,6,1,2,3

20. In a synaptic junction between a neuron and muscle fiber, receptors are located on:

- A. the muscle fiber.
- B. the neuronal membrane.
- C. Both of the above.

24. What peripheral nerves provide motor pathways to the diaphragm?

- A. cranial
- B. C2
- C. C4

D. T1

E. All of the above

C. oculomotor

D. all of the above

E. none of the above

25. Cutting what cranial nerve would lead to loss of vision?

- A. oculomotor
- B. optic
- C. olfactory
- D. facial
- E. vagus

29. The first synapse of a peripheral sensory neuron in the arm would be:

- A. in the ganglion in the under arm region
- B. in the dorsal root ganglion
- C. in the ventral root ganglion
- D. in the CNS
- E. none of the above

26. What cranial nerve is involved in the pain associated with a toothache?

- A. hypoglossal
- B. vagus
- C. facial
- D. trigeminal
- E. trochlear

30. In a polysynaptic reflex, which neuron is located entirely within the CNS?

- A. association
- B. motor
- C. sensory
- D. ganglionic

27. Cutting this nerve would lead to the loss of control of peristalsis (movement of the intestine):

- A. glossopharyngeal
- B. trigeminal
- C. vagus
- D. hypoglossal
- E. trochlear

31. White matter contains:

- A. myelin
- B. axons
- C. tracts
- D. all of the above
- E. none of the above

28. Which cranial nerve controls eye movement?

- A. abducens
- B. trochlear

32. Motor neurons conduct impulses to:

- A. cardiac muscle.
- B. smooth muscle.

C. skeletal muscle.

D. All of the above.

E. None of the above.

B. Myelinated fibers conduct impulses most rapidly.

C. Motor impulses are conducted more rapidly than sensory impulses.

D. Nerve impulses all travel at the same rate.

E. None of the above

33. Cutting the white matter of the spinal cord results in:

A. loss of voluntary motor activity

B. loss of sensory input

C. loss of reflex activity

D. choices A and B only

E. choices A and C only

37. If the anterior root of a spinal nerve were cut, what would be the result in the tissue or region supplied by that nerve?

A. Complete loss of sensation.

B. Complete loss of movement.

C. Complete loss of sensation and movement.

D. Complete loss of sensation, movement, and autonomic control of blood vessels and sweat glands.

E. Loss of neither sensation nor movement, but only of autonomic control of blood vessels and sweat glands.

34. Cutting the ventral horn of the gray matter results in:

A. loss of voluntary motor activity

B. loss of sensory input

C. loss of reflex activity

D. choices A and B only

E. choices A and C only

38. In a stretch reflex, an impulse travels to the spinal cord, then back (by way of the same nerve) to the muscle in which the impulse originated. As a result:

A. the muscle contracts, overcoming the stretch.

B. the muscle relaxes, increasing the tension.

C. the muscle fatigues, decreasing the energy needed to move.

D. A and C only

35. Cutting the ascending tracts results in:

A. loss of voluntary motor activity

B. loss of sensory input

C. loss of reflex activity

D. choices A and B only

E. choices A and C only

39. What force(s) best regulate the passage of sodium ions across a nerve cell membrane?

A. Sodium and potassium ion concentration gradients

B. Electrical charge on both sides of the cell membrane

C. Sodium/potassium pumps

36. Regarding the speed of impulse conduction, which of the following is True?

A. Nerve fibers classed as pain fibers conduct most rapidly.

D. All of the above

A. decrease from -70 to -30 MV.

B. increase from -70 to -90 MV.

C. decrease from -90 to -30 MV.

D. decrease from -70 to +30 MV.

E. increase from +30 to -70 MV.

40. During the absolute refractory period, a second action potential can be produced:

A. when the second stimulus is greater than the threshold stimulus.

B. when the second stimulus is less than the threshold stimulus.

C. under no conditions no matter what the strength of the stimulus is.

D. None of the above

41. Which of the following statements is "NOT" True of a nerve impulse?

A. Nerve impulse velocity is directly related to the diameter of the fiber.

B. It is a repeating sequence of polarity reversal and restoration of resting potential traveling in both directions along the nerve from its point of origin.

C. It is a self-perpetuating process that requires no expenditure of energy.

D. Nerve impulses do NOT travel through myelinated areas. Instead they jump from node to node in a leaping fashion.

42. An individual regularly adjusts her clothing by buttoning the top button of her blouse before any of the others. This is an example of a:

A. learned reflex.

B. conditioned reflex.

C. spinal reflex.

D. All of the above

E. A and B only

43. In order to have production of an action potential, the inside of the nerve cell must:

44. Graded potentials are:

A. pre-action potentials.

B. generated at dendrites and cell bodies only.

C. Both A and B

D. Neither A nor B

45. A cut on the finger would activate which receptors?

A. Tactile receptors

B. Baroreceptors

C. Chemoreceptors

D. Nocioceptors

46. The lateral spinothalamic tracts

A. are concerned with pain reflexes only.

B. are part of the gray matter of the spinal cord.

C. are found within the cerebral cortex.

D. carry motor impulses down the spinal cord from the brain.

E. None of the above

47. The "Cauda Equina" is a name given to (a):

A. clinical procedure used to induce anesthesia.

B. roots from the lower region of the spinal cord which run caudally to below the level of the conus medullaris before leaving the vertebral canal.

C. the middle meninx of the spinal cord.

D. a group of blood vessels that run within the vertebral canal.

E. the neural pathway that runs through the anterior horns of the spinal cord.

48. A pre-action potential always flows in one direction over a neuron, that is, it moves from the --?-- to the --?-- of the cell.

A. dendrite; cell body

B. cell body; axon

C. dendrite; cyton

D. All of the above

E. None of the above

49. Which of the following is NOT a type of neuroglial cell?

A. Astrocyte

B. Oligodendrocyte

C. Schwann cell

D. Nissl cell

50. How is the resting membrane potential of -70 MV (Millivolts) best interpreted?

A. The inside of the fiber is -70 MV.

B. The outside of the fiber is -70 MV.

C. The outside of the fiber is 70 MV more negative than the inside.

D. The inside of the fiber is 70 MV more negative than the outside.

E. None of the above

NERVOUS SYSTEM 3 ANSWERS

1. When a neuron is at rest, the inside of the cell contains more than .

A. K⁺; Na⁺.

B. Ca⁺⁺; Na⁺.

C. Na⁺; K⁺.

D. Fe⁺⁺; Fe⁺⁺⁺.

E. Na⁺; Ca⁺⁺.

2. The connective tissue wrapping around an entire nerve is called:

A. perimysium

B. epineurium

C. perineurium

D. endoneurium

E. epimysium

3. Neuroglia cells in the CNS are responsible for all except which one of the following:

A. phagocytosis of cellular debris.

B. myelination of axons.

C. neural regeneration.

D. provide neural support.

4. A neural impulse will proceed through a neuron in what anatomical sequence once a receptor is stimulated:

A. cell body to axon to dendrite.

B. axon to dendrite to cell body.

C. dendrite to axon to cell body.

A. 3,7,8,4,5,1,6,2

D. dendrite to cell body to axon.

B. 5,8,1,2,6,3,4,7

C. 1,2,7,3,5,8,4,6

D. 8,6,4,3,2,1,5,7

5. A motor nerve consists of:

A. dendrites.

E. 3,4,6,7,1,5,8,2

B. axons.

C. cell bodies.

8. Neuronal cell bodies are located in the CNS within:

D. All of the above.

A. nerves.

E. None of the above.

B. tracts.

C. gray matter.

6. The Na/K pump:

A. maintains the ionic concentration gradient across the resting neuron.

B. is briefly discontinued during depolarization.

9. If a neuron were experimentally placed in conditions where intracellular potassium were depleted, which of the following is a logical consequence?

C. is responsible for repolarization.

A. the neuron would hyper polarize.

D. All of the above.

B. the intracellular charge would become more positive.

E. None of the above.

C. the neuron would fire spontaneously.

7. Arrange the following events in the correct order of occurrence. An action potential involves:

1. increased K⁺ permeability; decreased Na⁺ permeability.

10. If a motor neuron in the body were stimulated by an electrode placed about midpoint along the length of the axon:

2. resting membrane potential reestablished.

A. the impulse would move to the motor end plate (synaptic bulb).

3. threshold stimulus applied.

B. sensory discrimination would occur.

4. increased Na⁺ permeability.

C. the impulse would spread to the dendrite and across the neuronal synapse.

5. K⁺ moves out.

D. the membrane would become hyper polarized.

6. Na⁺ moves into cell

E. nothing would happen.

7. depolarization occurs.

8. repolarization occurs.

The correct sequence is:

11. Cell bodies of sensory neurons of spinal nerves are located in:
- A. dorsal horn of gray matter.
 - B. ventral root.
 - C. dorsal root ganglion.**
 - D. dorsal white column.
 - E. central canal.
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- A. is composed of myelinated fibers.
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 - D. Peripheral nerves.
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19. What is the correct sequence that structures are involved in a spinal reflex?

- | | |
|-------------------------------|--|
| 1. Dorsal root ganglion | A. L1 |
| 2. Motor neuron axon | B. L3 |
| 3. Cutaneous receptor | C. S1 |
| 4. Synapse between neurons | D. S3 |
| 5. Sensory neuron dendrite | E. T10 |
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| 7. Motor neuron synaptic bulb | 23. Severing the spinal cord at what level would result in cardiac arrest? |

The correct sequence is:

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- A. C2
- B. C3
- C. C5
- D. T1
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24. What peripheral nerves provide motor pathways to the diaphragm?

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- B. C2
- C. C4**
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25. Cutting what cranial nerve would lead to loss of vision?

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- A. loss of voluntary motor activity
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- A. Nerve fibers classed as pain fibers conduct most rapidly.
 - B. Myelinated fibers conduct impulses most rapidly.**
 - C. Motor impulses are conducted more rapidly than sensory impulses.
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- A. when the second stimulus is greater than the threshold stimulus.
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- B. conditioned reflex.
- C. spinal reflex.
- D. All of the above
- E. A and B only**
43. In order to have production of an action potential, the inside of the nerve cell must:
- A. decrease from -70 to -30 MV.
- B. increase from -70 to -90 MV.
- C. decrease from -90 to -30 MV.
- D. decrease from -70 to +30 MV.**
- E. increase from +30 to -70 MV.
44. Graded potentials are:
- A. pre-action potentials.
- B. generated at dendrites and cell bodies only.
- C. Both A and B**
- D. Neither A nor B
45. A cut on the finger would activate which receptors?
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- B. Baroreceptors
- C. Chemoreceptors
- D. Nocioceptors**
46. The lateral spinothalamic tracts
- A. are concerned with pain reflexes only.
- B. are part of the gray matter of the spinal cord.
- C. are found within the cerebral cortex.
- D. carry motor impulses down the spinal cord from the brain.
- E. None of the above**
47. The "Cauda Equina" is a name given to (a):
- A. clinical procedure used to induce anesthesia.
- B. roots from the lower region of the spinal cord which run caudally to below the level of the conus medullaris before leaving the vertebral canal.**
- C. the middle meninx of the spinal cord.
- D. a group of blood vessels that run within the vertebral canal.
- E. the neural pathway that runs through the anterior horns of the spinal cord.
48. A pre-action potential always flows in one direction over a neuron, that is, it moves from the --?-- to the --?-- of the cell.
- A. dendrite; cell body
- B. cell body; axon
- C. dendrite; cyton

D. All of the above

E. None of the above

1. A	2. B	3. C	4. D	5. B		
6. A	7. E	8. C	9. A	10. A		
11. C		12. E		13.		

49. Which of the following is NOT a type of neuroglial cell?

- A. Astrocyte
- B. Oligodendrocyte
- C. Schwann cell
- D. Nissl cell**

50. How is the resting membrane potential of -70 MV (Millivolts) best interpreted?

- A. The inside of the fiber is -70 MV.
- B. The outside of the fiber is -70 MV.
- C. The outside of the fiber is 70 MV more negative than the inside.
- D. The inside of the fiber is 70 MV more negative than the outside.**
- E. None of the above

NERVE 3 ANSWERS

16. A	17. B	18.
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21. C

22. A

23.

26. D

27. C

28.

31. D

32. D

33.

36. B 37. B 38.

NERVE 4 NERVE TISSUE, EXCITABILITY, CONDUCTIVITY, SPINAL CORD & REFLEXES

DIRECTIONS: Read the questions carefully and pick the BEST CORRECT ANSWER. Then check your answer against the correct answers on the Key at the bottom of the page. Good luck.

1. The two major types of cells that are part of the nervous system are:

- A. brain and spinal cord
- B. neuroglia and neurons
- C. blood and connective
- D. epithelia and neuroglia
- E. neurons and muscle

2. ATP is important for a neuron so that,

- A. the Na^+/K^+ pump can operate
- B. neurotransmitters can be synthesized

- C. regeneration of CNS neurons can take place
- D. A and B above
- E. B and C above
3. A branch of an axon is called a(n)
- A. dendrite
- B. cyton
- C. axolemma
- D. nissl body
- E. telodendria
4. The knee jerk, in response to a sharp tap on the patellar tendon, is
- A. an autonomic reflex
- B. a conditioned reflex
- C. Occurs over a three-neuron reflex arc
- D. a spinal reflex
- E. described by more than one of the above
5. The dorsal root ganglion contains
- A. cerebral medulla nuclei
- B. cell bodies of sensory neurons
- C. cranial nerve axons
- D. synapses
- E. Cell bodies of motor neurons
6. Under no circumstances can a cell membrane become depolarized and a nerve impulse be produced during the:
- A. relative refractory period.
- B. absolute refractory period.
- C. resting potential period.
- D. all of the above
- E. A and B only
7. The dorsal root of the spinal nerve has been severed. What theoretical effect would you expect to see in such a patient?
- A. the individual would not be able to feel anything in the affected area
- B. the individual would not be able to move the skeletal muscle innervated by the spinal nerve
- C. the individual would not be able to move the skeletal muscle innervated or to feel in the affected area
- D. the individual would not be able to feel anything in the area of the opposite side of the body
- E. the individual would not be able to move the skeletal muscle innervated by that spinal nerve on the opposite side of the body
8. Vesicles containing neurotransmitter substances are present in the
- A. cell body.
- B. axolemma.
- C. terminal end bulb
- D. dendrites.
- E. mitochondria.
9. Saltatory conduction refers to;
- A. a very fast form of impulse transmission
- B. a very slow form of impulse transmission
- C. an increase in acetylcholine diffusion
- D. a "jumping" form of impulse transmission

E. 2 of the above are true

14 Sensory is to --?-- as --?-- is to efferent.

10. A glial cell that is a major component of the blood-brain barrier is the

- A. astrocyte.
- B. Microglia cell.
- C. oligodendrocyte.
- D. ependymal cell.
- E. Schwann cell.

11. An axon hillock ALONE produces either a complete action potential.

- A. True
- B. False

12. Which of the following IS/ARE a function of the nervous system?

- A. It senses changes within the body and in the outside environment.
- B. It interprets the changes.
- C. It may initiate a response to a stimulus.
- D. All of the above
- E. Two of the above

13. The minimum number of neurons that may be involved in the simplest reflex is:

- A. 1
- B. 2
- C. 3
- D. 4
- E. any number

- A. efferent; motor
- B. afferent; sensory
- C. afferent; motor
- D. motor; central
- E. none of the above are true

15. Which one of the following functions of neuroglial cells is NOT correct?

- A. Carry nerve impulses
- B. Help create cerebrospinal fluid
- C. Assist in attaching neurons to capillaries
- D. Phagocytosis
- E. some make myelin

16. A reflex arc:

- A. is the automatic action resulting from impulse conduction to muscle or gland cells.
- B. always includes a receptor and effector.
- C. usually has a afferent, efferent, and association neurons as components.
- D. always involves the spinal cord.
- E. B and C

17. Which of these is not required for a "sensation" to occur?

- A. A stimulus must be present.
- B. A receptor must pick up the stimulus.

C. The impulse must be conducted to the central nervous system

D. A response to the stimulus must be made.

E. The CNS must integrate the impulse.

22. The activity of transmitter substances can be stopped by:

A. dilution by diffusion

B. enzymatic destruction

C. vesicular reabsorption

D. all of the above

E. none of the above

18. Every thing we do is a reflex.

A. True

B. False

23. The deepest of the meninges is called the:

A. Pia

B. Dura

C. Arachnoid

D. Equina

E. none of the above

19. Action potentials can be generated by virtually all cells of the body because all cells possess cell membranes.

A. True

B. False

20. When a neuron is polarized, the inside of the cell contains more --?-- than --?--.

A. K⁺; Na⁺

B. Ca⁺⁺; Na⁺

C. Na⁺; K⁺

D. Sodium; protein

E. Na⁺; Ca⁺⁺

24. There are --?-- pairs of cranial nerves and --?-- pairs of spinal nerves.

A. 2; 12

B. 10; 30

C. 31; 12

D. 12; 31

E. 30; 10

21. The connection between 2 or more neurons is called a(n)

A. cleft

B. synapse

C. fissure

D. telodendria

E. axonal vesicle

25. The afferent division of the peripheral nervous system

A. transmits action potentials to sensory organs.

B. conveys action potentials to the CNS.

C. Both A and B

D. Neither A nor B

26. The primary site of protein synthesis in neurons is the

- A. axon.
- B. dendrite.
- C. cell body.
- D. terminal boutons.
- E. presynaptic vesicles.

27. Dendrites

- A. carry action potentials from the cell body.
- B. are generally long and unbranched.
- C. form synapses with the dendrites of neighboring neurons.
- D. respond to neurotransmitter substances.
- E. are found on neuroglial cells

28. Nissl bodies

- A. represent areas of rough endoplasmic reticulum.
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29. Neuroglia

- A. serve as the major supporting tissue in the CNS.
- B. participate in the formation of the blood-brain barrier.
- C. produce cerebrospinal fluid.
- D. form myelin sheaths around some axons.
- E. all of these

30. Action potentials travel faster in

- A. myelinated axons.
- B. axons with larger diameters.
- C. Both A and B
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31. Which of the following statements is false?

- A. In saltatory conduction, electrical charges flow from node to node.
- B. Myelination influences speed of conduction of action potentials.
- C. The lipid in the myelin sheath allows electrical charges to flow across the cell membrane to internode areas.
- D. All of the above.

32. In the PNS bundles of axons and their sheath are referred to as

- A. ganglia.
- B. nuclei.
- C. nerves.
- D. gray matter.
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36. Which of the following statements concerning the release of neurotransmitter at the synapse is false?

- A. Calcium ions must enter the presynaptic terminal for the release of neurotransmitter to occur.
- B. Synaptic vesicles release neurotransmitter by exocytosis into the synaptic cleft.
- C. Both presynaptic and postsynaptic terminals release neurotransmitter.
- D. Once neurotransmitter is released, it flows rapidly across the synaptic cleft.

37. Low extracellular calcium ion levels at a chemical synapse would tend to

- A. enhance transmission across the synapse.
- B. reduce or inhibit transmission across the synapse.
- C. have no effect on transmission across the synapse.

38. When two or more presynaptic neurons synapse with a single postsynaptic neuron in the CNS, the condition is called a(n) --?--circuit.

- A. convergent
- B. divergent
- C. oscillatory
- D. somatic
- E. sensory

39. Afferent neurons carrying action potentials from pain receptors synapse within the spinal cord with association neurons, which in turn, induce a reflex response. In addition, collateral axons synapse with ascending neurons that carry action potentials toward the brain. This is an example of a(n) circuit.

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40. Coordination via the endocrine system tends to differ from that produced by the nervous system because the endocrine system:

- A. has longer lasting effects.
- B. is slower and more coordinated.
- C. does not require conscious activity.
- D. All of the above
- E. None of the above

41. Nerve impulse conduction is unidirectional because:

- A. when the action potential reaches the axonal end bulb it causes production and

release of neurotransmitters; the latter carries the effect of the impulse across

the synapse.

B. when the action potential reaches the dendritic ending, nothing happens; thus,

it has to turn around and travel towards the axon.

C. Both A and B

D. Neither A nor B

42. Saltatory conduction is a result of --?-- present in a neuron.

A. A myelin sheath.

B. large nerve fibers.

C. Bouncing nerve impulses

D. erratic transmission of nerve impulses.

43. The All or None Law, as applied to nerve conduction states that the whole nerve cell must be stimulated for conduction to take place.

A. True

B. False

44. Reflexes are rapid, automatic responses to stimuli.

A. True

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45. Efferent nerve fibers may be described as motor.

A. True

B. False

46. The velocity of conduction by nerve fibers can be modified by the length of the nerve fiber.

A. True

B. False

47. Cell bodies of sensory neurons are located in ganglia lying outside the central nervous system.

A. True

B. False

48. Myelination of the nerve fibers in the central nervous system is the job of the oligodendrocyte.

A. True

B. False

49. During depolarization, the inside of the neuron's membrane becomes less negative.

A. True

B. False

50. In myelinated axons the voltage-gated sodium channels are concentrated at the nodes of Ranvier.

A. True

B. False

NERVOUS SYSTEM 4 ANSWERS

1. The two major types of cells that are part of the nervous system are:

A. brain and spinal cord

B. neuroglia and neurons

C. blood and connective

D. epithelia and neuroglia

- E. neurons and muscle
- E. Cell bodies of motor neurons
2. ATP is important for a neuron so that,
- the Na^+/K^+ pump can operate
 - neurotransmitters can be synthesized
 - regeneration of CNS neurons can take place
- D. A and B above**
- E. B and C above
6. Under no circumstances can a cell membrane become depolarized and a nerve impulse be produced during the:
- relative refractory period.
 - absolute refractory period.**
 - resting potential period.
 - all of the above
 - A and B only
3. A branch of an axon is called a(n)
- dendrite
 - cyton
 - axolemma
 - nissl body
- E. telodendria**
7. The dorsal root of the spinal nerve has been severed. What theoretical effect would you expect to see in such a patient?
- the individual would not be able to feel anything in the affected area**
 - the individual would not be able to move the skeletal muscle innervated by the spinal nerve
 - the individual would not be able to move the skeletal muscle innervated or to feel in the affected area
 - the individual would not be able to feel anything in the area of the opposite side of the body
 - the individual would not be able to move the skeletal muscle innervated by that spinal nerve on the opposite side of the body
4. The knee jerk, in response to a sharp tap on the patellar tendon, is
- an autonomic reflex
 - a conditioned reflex
 - Occurs over a three-neuron reflex arc
- D. a spinal reflex**
- E. described by more than one of the above
8. Vesicles containing neurotransmitter substances are present in the
- cell body.
 - axolemma.
 - terminal end bulb**
 - dendrites.
 - mitochondria.
5. The dorsal root ganglion contains
- cerebral medulla nuclei
 - cell bodies of sensory neurons**
 - cranial nerve axons
 - synapses

9. Saltatory conduction refers to;
- A. a very fast form of impulse transmission
 - B. a very slow form of impulse transmission
 - C. an increase in acetylcholine diffusion
 - D. a "jumping" form of impulse transmission
 - E. any number

E. 2 of the above are true

- 14 Sensory is to --?-- as --?-- is to efferent.
- A. efferent; motor
 - B. afferent; sensory
 - C. afferent; motor**
 - D. motor; central
 - E. none of the above are true

10. A glial cell that is a major component of the blood-brain barrier is the

- A. astrocyte.**
- B. Microglia cell.
- C. oligodendrocyte.
- D. ependymal cell.
- E. Schwann cell.

11. An axon hillock ALONE produces either a complete action potential.

- A. True**
- B. False

12. Which of the following IS/ARE a function of the nervous system?

- A. It senses changes within the body and in the outside environment.
- B. It interprets the changes.
- C. It may initiate a response to a stimulus.
- D. All of the above**
- E. Two of the above

13. The minimum number of neurons that may be involved in the simplest reflex is:

A. 1

B. 2

C. 3

D. 4

E. any number

15. Which one of the following functions of neuroglial cells is NOT correct?

A. Carry nerve impulses

B. Help create cerebrospinal fluid

C. Assist in attaching neurons to capillaries

D. Phagocytosis

E. some make myelin

16. A reflex arc:

A. is the automatic action resulting from impulse conduction to muscle or

gland cells.

B. always includes a receptor and effector.

C. usually has a afferent, efferent, and association neurons as components.

D. always involves the spinal cord.

E. B and C

C. fissure

D. telodendria

E. axonal vesicle

17. Which of these is not required for a “sensation” to occur?

A. A stimulus must be present.

B. A receptor must pick up the stimulus.

C. The impulse must be conducted to the central nervous system

D. A response to the stimulus must be made.

E. The CNS must integrate the impulse.

18. Every thing we do is a reflex.

A. True

B. False

19. Action potentials can be generated by virtually all cells of the body because all cells possess cell membranes.

A. True

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20. When a neuron is polarized, the inside of the cell contains more --?-- than --?--.

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21. The connection between 2 or more neurons is called a(n)

A. cleft

B. synapse

22. The activity of transmitter substances can be stopped by:

A. dilution by diffusion

B. enzymatic destruction

C. vesicular reabsorption

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E. none of the above

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A. True

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49. During depolarization, the inside of the neuron's membrane becomes less negative.

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A. True

B. False

NERVE TISSUE, EXCITABILITY, CONDUCTIVITY, SPINAL CORD & REFLEXES

DIRECTIONS: Read the questions carefully and pick the BEST CORRECT ANSWER. Then check your answer

against the correct answers on the Key at the bottom of the page. Good luck.

1. If bacteria were to invade the nervous tissue, microglia would migrate to the area to engulf and destroy them.

A. True

B. False

2. The node of Ranvier is found only on myelinated neural processes.

A. True

B. False

3. Graded potentials exhibit all the following EXCEPT they:

A. are short lived.

B. can form on receptor endings.

C. increase amplitude as they move away from the stimulus point.

D. can be called postsynaptic potentials.

4. The entire period after an initial stimulus when a neuron is NOT sensitive to another stimulus is the:

A. resting period.

B. repolarization.

C. depolarization.

D. transient period.

E. refractory period.

5. A bullet entered a person within the vicinity of his spinal cavity. Which order of the structures listed below, is most correct in describing the bullet's pathway.

1. Spinal cord

2. Pia mater

3. Arachnoid

4. Subarachnoid space

5. Dura mater

6. Vertebra

Select answers below

A. 1,2,3,4,5,6

B. 6,5,3,4,2,1

C. 2,6,1,4,5,3

D. 2,1,5,4,3,6

E. 4,5,6,3,2,1

6. Which of the following is NOT a structural feature of a neuron?

A. Synaptic cleft

B. Nissl bodies

C. Dendrites

D. Axon

7. If one incoming impulse produces several outgoing nerve impulses, we know that there is a(n):

A. converging circuit.

B. concentration effect.

C. diverging circuit.

D. reverberating circuit.

E. parallel circuit.

8. The point at which an impulse from one nerve cell is communicated to another nerve cell is the

- A. cell body.
B. synapse.
C. receptor.
D. effector
9. Collections of nerve cell bodies inside the central nervous system are called:

A. nuclei.
B. nerves.
C. ganglia.
D. tracts.
10. The term "central nervous system" refers to the

A. autonomic nervous system.
B. brain, spinal cord, and peripheral nerves.
C. brain and spinal cord.
D. spinal cord and spinal nerves.
11. A neuron which has its primary function the job or action of connecting other neurons is called:

A. a motor neuron.
B. a sensory neuron.
C. an association neuron.
D. a glial cell.
12. In what way does the interior of a resting neuron differ from the external environment? It (the interior) is:

A. positively charged and contains less sodium.
B. negatively charged and contains less sodium.
C. negatively charged and contains more sodium.
D. positively charged and contains more sodium.
13. The part of the neuron that acts as receptor region is called:

A. an axon.
B. a dendrite.
C. a neurilemma.
D. a Schwann cell.
14. Place the following parts of the reflex arc in proper sequence

A. effector-motor neuron-integration center-sensory neuron-receptor.
B. receptor-motor neuron-integration center-sensory neuroneffector.
C. receptor-sensory neuron-integration center-motor neuron-effector.
D. effector-sensory neuron-integration center-motor neuron-receptor.
E. sensory neuron-receptor-integration center-effector-motor neuron.
15. Schwann cells are important because they:

A. produce myelin in the CNS
B. allow for regeneration of fibers in the PNS
C. produce myelin in the PNS
D. A and B
E. B and C
16. Sensory is related to -?– as -?– is related to efferent.

A. efferent; motor
B. afferent; sensory

- C. afferent; motor
- D. motor; central
- E. none of the above are true

- A. Pia
- B. Dura
- C. Arachnoid
- D. Equina

17. Which one of the following functions of neuroglia cells is not correct?

- A. carry nerve impulses
- B. help create C.S.F.
- C. assist in getting capillaries close to neurons
- D. phagocytosis
- E. make myelin

21. Which one of the following terms is not related directly to the others?

- A. choroid plexus
- B. lumbar plexus
- C. cervical plexus
- D. sacral plexus
- E. brachial plexus

18. The initial event that allows an action potential to occur is:

- A. the repolarization of the cell body
- B. the opening of the pores due to a stimulus or a neurotransmitter
- C. an influx of K⁺
- D. an out pouring of Na⁺
- E. depolarization

22. Unlike continuous conduction, saltatory conduction

- A. is a slower means of impulse transmission
- B. requires more energy
- C. is characteristic of unmyelinated neurons
- D. does not have a refractory period
- E. none of the above

19. A period of time during which no stimulus will evoke a response is called the:

- A. threshold phase
- B. summation time
- C. saltatory period
- D. relative refractory period
- E. none of the above

23. The inferior end of the spinal cord is:

- A. at L-4
- B. in the shape of a horse's tail
- C. tapered in the shape of a cone
- D. at the sacrum
- E. all of the above are true

20. The most superficial of the meninges is called the:

24. Axons:

- A. arise from an area of a cell body called the hillock
- B. may be single or branched into collaterals
- C. vary in length from a few millimeters to over 1 meter
- D. have a distal portion which branches into an arrangement called telodendria
- E. all of the above
25. In considering a typical spinal reflex
- A. the incoming (sensory) impulses enter the spinal cord through the ventral root of the spinal nerve
- B. the sensory fibers have their cells of origin located in the brain
- C. all the nerve fibers involved are un-myelinated
- D. the sensory neuron involved has its cell body located in the dorsal root ganglion
- E. synaptic connections are made across the spinal cord to neurons in the brain
26. Which one of the following is located in the ventral (anterior) horn of the spinal cord?
- A. receptors
- B. cell bodies of motor (efferent) neurons
- C. synapses
- D. axons of afferent nerves
- E. cell bodies of sensory (afferent) neurons
27. Walking gingerly between scores of puddles in a large parking lot is an example of a :
- A. Coordinated reflex
- B. Conditioned reflex
- C. Inborn reflex
- D. Vital reflex
- E. All of the above
28. Which fibers, if cut, are capable of regeneration because of the presence of a neurilemma around the fibers:
1. Those in the femoral nerve, a peripheral nerve.
 2. Those in the association areas of the brain.
 3. Those in the spinothalamic tract of the spinal cord.
- Select answer below
- A. 1 only
- B. 2 only
- C. 3 only
- D. none of the above
- E. all of the above
29. Which of the following is true?
- A. the neurotransmitter secreted by all dendrites is acetylcholine
- B. a synapse is the junction between the afferent fibers of two neurons
- C. the electrical activity of an impulse raises the threshold of the synapse
- D. the terminations of motor neurons on muscle cells are termed synapses
- E. the nerve impulse can travel only one way across a synapse
30. Dendrites of a neuron
- A. are always covered with a neurilemma (sheath of Schwann)
- B. conduct a pre-action potential toward the cell body

- C. secrete acetylcholine or norepinephrine
 - D. may regenerate, if cut, because of the presence of a myelin sheath
 - E. are described or function in all of the above ways
- A. Breathing and vasomotor reflexes
 - B. Vasomotor and cardiac reflexes
 - C. Choking and swallowing reflexes
 - D. Knee jerk and ankle jerk reflexes
 - E. Vomiting and suckling reflexes

31. Gray matter is composed mostly of:

- A. cell bodies
- B. nerves
- C. axons
- D. dendrites
- E. tracts

35. Which of the following is located entirely within the CNS

- A. sensory neuron
- B. motor neuron
- C. association neuron
- D. all of the above
- E. none of the above

32. In the spinal cord

- A. the gray matter is composed almost entirely of myelinated nerve fibers
- B. the white matter is composed chiefly of myelinated nerve fibers
- C. the gray matter consists of ascending tracts
- D. the white matter consists only of descending tracts
- E. none of the above

36. Severing of a spinal nerve could result in

- A. paralysis of muscle in areas supplied by the nerve
- B. loss of sensation in areas supplied by the nerve
- C. paralysis of muscles on the opposite side of the body
- D. A and B above
- E. B and C above

33. The knee jerk in response to a sharp tap on the patellar tendon is

- A. an autonomic reflex
- B. a conditioned reflex
- C. mediated by a three-neuron reflex arc
- D. a spinal reflex
- E. described by more than one of the above

37. Neurons have cytoplasmic extensions which connect one neuron to another.

Given the following structures:

1. dendrite
2. cell body
3. axon
4. telodendria

34. Which of the following are not vital reflexes?

5. Terminal end bulb

Choose the arrangement which lists the structures over which an pre-action potential

and then a legitimate action potential would travel.

A. 1,2,3,4,5

B. 2,3,4,5,1

C. 3,4,5,1,2

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A. resting period.

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38. The spinal cord extends from the

A. medulla to coccyx

B. level of the axis to L-5

C. foramen magnum to C-1

D. axis to S-5

E. C-1 to S-2

5. A bullet entered a person within the vicinity of his spinal cavity. Which order of the structures listed below, is most correct in describing the bullet's pathway.

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Select answers below

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NERVOUS SYSTEM-5 ANSWERS

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A. True

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D. a Schwann cell.

14. Place the following parts of the reflex arc in proper sequence

A. effector-motor neuron-integration center-sensory neuron-receptor.

B. receptor-motor neuron-integration center-sensory neuroneffector.

C. receptor-sensory neuron-integration center-motor neuron-effector.

D. effector-sensory neuron-integration center-motor neuron-receptor.

E. sensory neuron-receptor-integration center-effector-motor neuron.

15. Schwann cells are important because they:

A. produce myelin in the CNS

B. allow for regeneration of fibers in the PNS

C. produce myelin in the PNS

D. A and B

E. B and C

16. Sensory is related to –?– as –?– is related to efferent.

A. efferent; motor

B. afferent; sensory

C. afferent; motor

D. motor; central

E. none of the above are true

17. Which one of the following functions of neuroglia cells is not correct?

A. carry nerve impulses

B. help create C.S.F.

C. assist in getting capillaries close to neurons

D. phagocytosis

E. make myelin

18. The initial event that allows an action potential to occur is:

A. the repolarization of the cell body

B. the opening of the pores due to a stimulus or a neurotransmitter

C. an influx of K⁺

D. an out pouring of Na⁺

E. depolarization

19. A period of time during which no stimulus will evoke a response is called the:

A. threshold phase

B. summation time

C. saltatory period

D. relative refractory period

E. none of the above

20. The most superficial of the meninges is called the:

A. Pia

B. Dura

C. Arachnoid

D. Equina

E. none of the above

21. Which one of the following terms is not related directly to the others?

A. choroid plexus

B. lumbar plexus

C. cervical plexus

D. sacral plexus

- E. brachial plexus
22. Unlike continuous conduction, saltatory conduction
- A. is a slower means of impulse transmission
 - B. requires more energy
 - C. is characteristic of unmyelinated neurons
 - D. does not have a refractory period
 - E. none of the above**
23. The inferior end of the spinal cord is:
- A. at L-4
 - B. in the shape of a horse's tail
 - C. tapered in the shape of a cone
 - D. at the sacrum
 - E. all of the above are true**
24. Axons:
- A. arise from an area of a cell body called the hillock
 - B. may be single or branched into collaterals
 - C. vary in length from a few millimeters to over 1 meter
 - D. have a distal portion which branches into an arrangement called telodendria
 - E. all of the above**
25. In considering a typical spinal reflex
- A. the incoming (sensory) impulses enter the spinal cord through the ventral root of the spinal nerve
 - B. the sensory fibers have their cells of origin located in the brain
- C. all the nerve fibers involved are un-myelinated
- D. the sensory neuron involved has its cell body located in the dorsal root ganglion**
- E. synaptic connections are made across the spinal cord to neurons in the brain
26. Which one of the following is located in the ventral (anterior) horn of the spinal cord?
- A. receptors
 - B. cell bodies of motor (efferent) neurons**
 - C. synapses
 - D. axons of afferent nerves
 - E. cell bodies of sensory (afferent) neurons
27. Walking gingerly between scores of puddles in a large parking lot is an example of a :
- A. Coordinated reflex**
 - B. Conditioned reflex
 - C. Inborn reflex
 - D. Vital reflex
 - E. All of the above
28. Which fibers, if cut, are capable of regeneration because of the presence of a neurilemma around the fibers:
1. Those in the femoral nerve, a peripheral nerve.
 2. Those in the association areas of the brain.
 3. Those in the spinothalamic tract of the spinal cord.
- Select answer below
- A. 1 only**
 - B. 2 only

- C. 3 only
- D. none of the above
- E. all of the above
29. Which of the following is true?
- A. the neurotransmitter secreted by all dendrites is acetylcholine
 - B. a synapse is the junction between the afferent fibers of two neurons
 - C. the electrical activity of an impulse raises the threshold of the synapse
 - D. the terminations of motor neurons on muscle cells are termed synapses
 - E. the nerve impulse can travel only one way across a synapse**
30. Dendrites of a neuron
- A. are always covered with a neurilemma (sheath of Schwann)
 - B. conduct a pre-action potential toward the cell body**
 - C. secrete acetylcholine or norepinephrine
 - D. may regenerate, if cut, because of the presence of a myelin sheath
 - E. are described or function in all of the above ways
31. Gray matter is composed mostly of:
- A. cell bodies**
 - B. nerves
 - C. axons
 - D. dendrites
 - E. tracts
32. In the spinal cord
- A. the gray matter is composed almost entirely of myelinated nerve fibers
 - B. the white matter is composed chiefly of myelinated nerve fibers**
 - C. the gray matter consists of ascending tracts
 - D. the white matter consists only of descending tracts
 - E. none of the above
33. The knee jerk in response to a sharp tap on the patellar tendon is
- A. an autonomic reflex
 - B. a conditioned reflex
 - C. mediated by a three-neuron reflex arc
 - D. a spinal reflex**
 - E. described by more than one of the above
34. Which of the following are not vital reflexes?
- A. Breathing and vasomotor reflexes
 - B. Vasomotor and cardiac reflexes
 - C. Choking and swallowing reflexes
 - D. Knee jerk and ankle jerk reflexes**
 - E. Vomiting and suckling reflexes
35. Which of the following is located entirely within the CNS
- A. sensory neuron
 - B. motor neuro
 - C. association neuron**

- D. all of the above
- E. none of the above
36. Severing of a spinal nerve could result in
- A. paralysis of muscle in areas supplied by the nerve
 - B. loss of sensation in areas supplied by the nerve
 - C. paralysis of muscles on the opposite side of the body
 - D. A and B above**
 - E. B and C above

37. Neurons have cytoplasmic extensions which connect one neuron to another.

Given the following structures:

1. dendrite
2. cell body
3. axon
4. telodendria
5. Terminal end bulb

Choose the arrangement which lists the structures over which an pre-action potential

and then a legitimate action potential would travel.

- A. 1,2,3,4,5**
- B. 2,3,4,5,1
- C. 3,4,5,1,2
- D. 2,3,1,4,5
- E. 3,1,4,3,5

38. The spinal cord extends from the

- A. medulla to coccyx
- B. level of the axis to L-5**
- C. foramen magnum to C-1
- D. axis to S-5
- E. C-1 to S-2

BRAIN 1 BRAIN STRUCTURE AND FUNCTION

DIRECTIONS: Read the questions carefully and pick the **BEST CORRECT ANSWER**. Then check your answer against the correct answers on the Key at the bottom of the page. Good luck.

1. Almost all sensory impulses pass through what structure (s) on their way to the cerebral cortex?
 - A. Basal ganglia
 - B. Corpus striatum
 - C. Hypothalamus
 - D. Mammillary bodies
 - E. Thalamus
2. Which of these is/are "TRUE"?
 - A. The 4th ventricle is a diamond-shaped expansion of the central canal within the brainstem
 - B. The third ventricle is a thin chamber lying below the corpus callosum and septum pellucidum
 - C. The lateral ventricles are two irregular cavities, one in each cerebral hemisphere
 - D. All of the above
 - E. None of the above
3. Which is the proper order for cerebrospinal fluid flow?
 - A. Lateral ventricles, foramen of Monro, 3rd ventricle, aqueduct Of Sylvius, 4th ventricle, subarachnoid space.
 - B. 3rd ventricle, aqueduct of Sylvius, lateral ventricle

- C. 4th ventricle, foramen of Magendie, central canal of spinal Cord
- D. Subarachnoid space, subdural space, extra dural space
4. Occlusion of the major veins draining the brain is likely to have what significant effect on the cerebrospinal fluid?
- A. It will become diluted
- B. Its lymphatic composition will increase
- C. Its hydrostatic pressure will increase
- D. Its volume of CSF will decrease
- E. All of the above
5. In order to see the time on the wall clock, nerve impulses directed from your --?-- must travel to the --?-- .
- A. Superior colliculus; rectus muscles of your eyes to contract And move your eyes.
- B. Superior colliculus; sternomastoid muscle to turn your head.
- C. Both A and B
- D. Neither A nor B
6. Which of the following is NOT a vital reflex controlled by the medulla oblongata?
- A. Regulation of the pacemaker of the heart
- B. Regulation of resistance to blood flow, and blood pressure
- C. Monitoring the rhythmicity of breathing
- D. Controlling the internal feedback control for thinking
7. Which of these is NOT a reflex whose center is in the medulla oblongata?
- A. Choking
- B. Breathing
- C. Speaking
- D. Swallowing
- E. Coughing
8. Diffusion across the arachnoid villi returns excess CSF to
- A. The third ventricle
- B. Venous circulation
- C. Arterial circulation
- D. The fourth ventricle
9. Feeling satiated and relaxed after a full meal is related to the function of the:
- A. Pons
- B. Hypothalamus
- C. Cerebellum
- D. Medulla
- E. Cerebrum
10. The fact that each half of the brain controls opposite sides of the body is partly explained by the:
- A. Division of the cerebrum into two hemispheres
- B. Division of the cerebellum into two hemispheres
- C. Decussation of the pyramids
- D. Crossing of fiber tracts in the midbrain
- E. Division of the brain into six parts
11. The center controlling the cough reflex is located in the same part of the brain as one of the major centers controlling

- A. Blood pressure
B. Equilibrium
C. Vision
D. Speech
E. Hearing
12. Which of the following is/are TRUE?
A. Damage to the thalamus impairs consciousness and the cerebral Arousing mechanism.
B. The agnostic area is the principal integrating area for Sensory impulses coming the cerebral cortex.
C. Both A and B
D. Neither A nor B
13. In a comparison between the temperature regulation of a room and that of the human body, the hypothalamus is similar to the thermostat, while the heat-producing action of the furnace is similar to:
A. Increased breathing
B. Increased blood flow through skin providing for sweating
C. Chills(uncontrolled skeletal muscle contractions)
D. All of the above
E. None of the above
14. The hypothalamus secretes substances that function as releasing factors for:
A. Skeletal muscle contraction
B. Smooth muscle contraction
C. Anterior pituitary hormones
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15. Which of the following is "not" TRUE of the hypothalamus?
A. All afferent impulses are relayed here before they reach the Cerebellum.
B. The hypothalamus is considered closely associated with the RAS which controls the degree of wakefulness
C. It secretes several releasing factors that regulate the Secretion and release of hormones from the anterior pituitary
D. The hypothalamus is the center that coordinates many body Functions such as body temperature regulation and thirst
16. "Satiety":
A. Is usually the result of being full or eating too much.
B. Is caused by having too much alcohol at one time.
C. Promotes the formation of hiatal hernias.
D. Causes the desire to have a bowel movement or B.M.
E. Causes a strong physiological desire to eat more food.
17. Which of these pairs are the most nearly identical?
A. Cerebral arousing center of hypothalamus and the reticular Activating system
B. Broca's speech area and the reticular formation
C. Hypothalamus and thalamus
D. Infundibulum and the pituitary gland
E. Pneumotaxic center and respiratory center
18. The ability to enjoy the pleasures of sex would be impossible if:

A. There was a tumor in your limbic system

A. Pneumotaxic center of the pons

B. You did NOT have a vas deferens(male) or oviduct(female).

B. Reticular activating system of the thalamus

C. Both A and B

C. Both A and B

D. Neither A nor B

D. Neither A nor B

19. "Pleasure centers" and "punishment centers" of the brain are located in the:

A. Mammillary bodies

23. Which of these would be a type of behavior controlled by the limbic system?

B. Limbic system

A. Watching the car in front of you skid on a wet pavement and Destroy a stop light

C. Precentral gyrus

B. Seeing your fiancee' win the Maryland Lotto

D. Prefrontal area

C. Both A and B

E. Intermediate mass

D. Neither A nor B

20. What part of the brain is inactive when the RAS is inactive:

A. Thalamus

24. "The thalamus is the lowest level of consciousness". This means that

B. Cerebellum

A. If nerve impulses reach the thalamus, the individual will be At least slightly aware of them.

C. Cerebral cortex

B. If the thalamus is destroyed, the individual will still be Conscious.

D. Hypothalamus

C. Both A and B

D. Neither A nor B

21. Which of these would NOT be in the exact center of a midsagittal section of the brain?

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C. Vermis of cerebellum

B. A big hug from your boyfriend (or girlfriend).

D. Cerebral peduncle

C. The thought of strawberry shortcake covered with ice cream at Friendly's restaurant

E. Hypothalamus

D. All of the above

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22. Which of these works through a positive feedback?

26. Looking squarely at the teacher's tie at the front of the classroom, the overhead projection screen,

chemistry chart and projection lamp appear out of focus.
This scenario describes how the --?-- works.

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27. Which of the following is "not" a function of the cerebrum?

- A. Interpreting smell and taste
- B. Acting as control center of the breathing reflex
- C. Regulating voluntary movements
- D. Making moral judgements
- E. Determining the size and shape of a new car

31. The ability to solve problems is called:

- A. Learning
- B. Reasoning
- C. Conditioning
- D. Habituation

32. The type of sensation that a person feels is

- A. Determined solely by the receptor that detects the sensation
- B. A function of the thalamus and cerebral cortex
- C. Both A and B
- D. Neither A nor B

33. Which of the following would have the greatest amount of cortical area devoted to their control?

- A. Hips
- B. Hands
- C. Toes
- D. Knees
- E. Wrists

29. The ability to recall thought is the definition of

- A. Perception
- B. Memory
- C. Sensation
- D. Arousal
- E. Ideas

34. Sensations that are very discretely located include
- A. Aching pain
 - B. Light touch
 - C. Position of a part of your body relative to something else
 - D. All of the above
 - E. B and C only
35. The visual association area:
- A. Interprets written language by distinguishing shapes of letters In words
 - B. Interprets what a sentence means when it comes over the radio
 - C. Would be used to identify the location of the pons vs the Thalamus on a model of brainstem
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36. Which of the following is a correct pathway for interpretation of communicated ideas?
- A. Auditory cortex -> auditory association area -> gnostic area
 - B. Primary auditory area -> auditory association area -> common Integrative area
 - C. Both A and B
 - D. Neither A nor B
37. The part of the brain the "directs" precise smooth movements and maintenance of equilibrium is the:
- A. Cerebrum
 - B. Cerebellum
 - C. Pons
 - D. Hypothalamus
38. Whereas the auditory area of the brain is in the --?-- lobe, the visual area is in the --?-- area.
- A. Parietal; frontal
 - B. Insular; temporal
 - C. Temporal; occipital
 - D. Broca's; somesthetic
 - E. None of the above
39. The basal ganglia:
- A. Are involved in slowing down motor output from the precentral And premotor gyri of the cerebral cortex
 - B. Control all postural reflexes
 - C. Control the secretion and release of Antidiuretic hormone from The hypothalamus and posterior pituitary, respectively.
 - D. All of the above
 - E. A and B only
40. An elderly gentleman had just suffered a stroke. He is able to understand verbal and written language, but when he tries to respond, his words come out garbled. What cortical region has been damaged?
- A. Visual area of occipital lobe
 - B. Broca's area of frontal lobe
 - C. Primary sensory area of parietal lobe
 - D. Premotor area of frontal lobe
 - E. None of the above
41. Terminal ganglia are sometimes located with the organ innervated.
- A. True B. False

42. Dual innervation means that an organ had both sensory and motor nerves innervating it.

- A. True
- B. False

43. Which of the following is NOT TRUE of the parasympathetic division of the autonomic nervous system?

- A. is known as the "feed and breed" division because of the effectors it turns on
- B. it has long preganglionic fibers
- C. its postganglionic fibers are short
- D. its postganglionic fibers are adrenergic

44. The autonomic nervous system:

- A. operates reflexly
- B. contains visceral efferent fibers only
- C. contains ganglia and plexuses
- D. contains peripheral nerves
- E. all of the above

45. Stimulation of the parasympathetic nervous system causes:

- A. vasoconstriction of the blood vessels of the gastrointestinal Tract
- B. increased peristalsis in the gastrointestinal tract
- C. decreased tone of the gastrointestinal sphincters
- D. inhibition of the secretions of the gi glands
- E. all of the above

46. Which of these is NOT a function of the sympathetic division of the autonomic nervous system?

- A. dilate the pupil
- B. dilate the bronchi and bronchioles of the lung
- C. accelerate the heart rate
- D. increases the rate of urination and feces formation
- E. all of the above are a function of the sympathetic division

47. Which statement concerning the autonomic nervous system is false?

- A. the sympathetic division is a mixed division having both Cholinergic and adrenergic fibers
- B. the parasympathetic division is totally adrenergic
- C. most visceral effectors have dual innervation with the two Divisions producing antagonistic effects
- D. in stress, the sympathetic division tends to dominate
- E. none of the above

48. The sympathetic nervous system:

- A. in most cases releases acetylcholine from the post-ganglionic Neuron
- B. stimulates digestion
- C. is mimicked by adrenalin
- D. emanates from the spinal cord

49. Which of the following is/are TRUE?

- A. neurons, like muscle cells, conduct impulses according to the all or none law.
- B. acetylcholine is the predominant neurotransmitter in the Peripheral nervous system
- C. Both A and B
- D. Neither A nor B

50. Which of the following is/are TRUE?
- all organs of the body have both sympathetic and parasympathetic nerve supplies Sympathetic innervation.
 - the preganglionic neurons of both sympathetic and parasympathetic systems secreted acetylcholine(ACh).
 - Both A and B
 - Neither A nor B
3. Which is the proper order for cerebrospinal fluid flow?
- Lateral ventricles, foramen of Monro, 3rd ventricle, aqueduct Of Sylvius, 4th ventricle, subarachnoid space.**
 - 3rd ventricle, aqueduct of Sylvius, lateral ventricle
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BRAIN-1 ANSWERS

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- B. Acting as control center of the breathing reflex**
- C. Regulating voluntary movements
- D. Making moral judgements
- E. Determining the size and shape of a new car

28. The famous lion tamer of the Ringling Bros/Barnum and Bailey circus, Mr. Claude Tibbits, often failed to wash up after leaving the lion's den. His body odor(B0) had emanated from the performer's lounge until sometime after he left. Claude had caused --?-- to occur.

- A. Projections

B. Adaptations

C. After-images

D. Modulations

C. Both A and B

D. Neither A nor B

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B. Memory

C. Sensation

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D. Broca's; somesthetic

E. None of the above

39. The basal ganglia:

A. Are involved in slowing down motor output from the precentral And premotor gyri of the cerebral cortex

B. Control all postural reflexes

C. Control the secretion and release of Antidiuretic hormone from The hypothalamus and posterior pituitary, respectively.

D. All of the above

E. A and B only

40. An elderly gentleman had just suffered a stroke. He is able to understand verbal and written language, but when he tries to respond, his words come out garbled. What cortical region has been damaged?

A. Visual area of occipital lobe

B. Broca's area of frontal lobe

C. Primary sensory area of parietal lobe

D. Premotor area of frontal lobe

E. None of the above

41. Terminal ganglia are sometimes located with the organ innervated.

A. True B. False

42. Dual innervation means that an organ had both sensory and motor nerves innervating it.

A. True B. False

43. Which of the following is NOT TRUE of the parasympathetic division of the autonomic nervous system?

A. is known as the "feed and breed" division because of the effectors it turns on

B. it has long preganglionic fibers

C. its postganglionic fibers are short

D. its postganglionic fibers are adrenergic

44. The autonomic nervous system:

A. operates reflexly

B. contains visceral efferent fibers only

C. contains ganglia and plexuses

D. contains peripheral nerves

E. all of the above

45. Stimulation of the parasympathetic nervous system causes:

A. vasoconstriction of the blood vessels of the gastrointestinal Tract

B. increased peristalsis in the gastrointestinal tract

C. decreased tone of the gastrointestinal sphincters

D. inhibition of the secretions of the gi glands

E. all of the above

46. Which of these is NOT a function of the sympathetic division of the autonomic nervous system?

A. dilate the pupil

B. dilate the bronchi and bronchioles of the lung

C. accelerate the heart rate

D. increases the rate of urination and feces formation

E. all of the above are a function of the sympathetic division

47. Which statement concerning the autonomic nervous system is false?

A. the sympathetic division is a mixed division having both Cholinergic and adrenergic fibers

B. the parasympathetic division is totally adrenergic

C. most visceral effectors have dual innervation with the two Divisions producing antagonistic effects

D. in stress, the sympathetic division tends to dominate

E. none of the above

48. The sympathetic nervous system:

A. in most cases releases acetylcholine from the post-ganglionic Neuron

B. stimulates digestion

C. is mimicked by adrenalin

D. emanates from the spinal cord

49. Which of the following is/are TRUE?

A. neurons, like muscle cells, conduct impulses according to he all or none law.

B. acetylcholine is the predominant neurotransmitter in the Peripheral nervous system

C. Both A and B

D. Neither A nor B

50. Which of the following is/are TRUE?

A. all organs of the body have both sympathetic and parasympathetic nerve supplies Sympathetic innervation.

B. the preganglionic neurons of both sympathetic and parasympathetic systems secreted acetylcholine(ACH).

C. Both A and B

D. Neither A nor B

BRAIN 2 BRAIN STRUCTURE AND FUNCTION

DIRECTIONS: Read the questions carefully and pick the BEST CORRECT ANSWER. Then check your answer against the correct answers on the Key at the bottom of the page. Good luck.

1. A local PG politician by the name of Jerry Mander knows just where his hands are when he's trying to get a bill through the Maryland Senate. He waves them around, often jesting to his colleagues to support his measures. This ability to understand the spatial representation of his arms is a function of the:

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- C. Postcentral gyrus
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2. Nurse Karen Feading was often seen walking briskly through the wards in the obstetrics area of largo community hospital. She was essentially unaware of the swinging action of her arms as she talked to her colleagues. What area of Karen's brain controlled the movement of her arms?
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- B. Basal ganglia
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- A. Regulation of body temperature
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- B. White matter is composed chiefly of unmyelinated fibers.
- C. Gray matter is so called because of the density of nerve cell bodies, each containing abundant Nissl substance.
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C. Used for diagnosis in clinical situations.

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 - B. separates the cerebral hemispheres.
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- B. parietal and occipital lobes.

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43. Which of the following is/are a true statement?

A. Anti-diuretic hormone or ADH acts to increase the rate of filtration at the glomerulus of the kidney and thus causes more reabsorption of water.

B. The hypothalamus has both inhibitory and excitatory control over contraction of smooth muscle in the walls of the viscera.

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D. Neither A nor B

44. Which of the following is not a response to sympathetic stimulation?

A. Increased heart rate

B. Increased blood pressure

C. Increased motility of the digestive tract

D. Increased metabolism

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38. A young man is admitted to the hospital after receiving serious burn resulting from standing with his back too close to a bonfire. He is muttering that he never felt the pain--otherwise, he would have smothered the flames by rolling on the ground. What part of his CNS is dysfunctional?

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41. Which of the following is not ordinarily accomplished through associative memory?

A. Dilation of your pupils during extreme excitement.

45. Which one of the following is "not" true of both ordinary somatic efferent activity and autonomic function?

- A. The impulses pass through ventral roots of spinal nerves.
- B. The fiber emerging from the CNS releases acetylcholine at its endings.
- C. The cell body of the fiber emerging from the CNS lies in the lateral gray column of the spinal cord.
- D. A pre and a post synaptic neuron exist between the spinal cord and the effector organ or muscle.

46. Which of the following is a true statement?

- A. Adrenalin or epinephrine is the hormone released by the adrenal gland during a stressful situation.
- B. Noradrenaline/norepinephrine is the neurotransmitter released from post ganglionic neurons of the sympathetic nervous system.
- C. Both A and B
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47. The preganglionic autonomic nerve fibers that arise from the thoracic and lumbar parts of the spinal cord:

- A. are also called preganglionic sympathetic fibers.
- B. synapse with postganglionic fibers of the parasympathetic nervous system.
- C. form the dorsal roots of the thoracic and lumbar spinal nerves.
- D. are also called preganglionic parasympathetic fibers.

48. You've just consumed thanksgiving dinner; yes, even the green jell-o. Now you retreat to the couch, snuggle up under an afghan, and turn on the interviews that precede the afternoon football game. The ? division of your autonomic nervous system is predominately in command of your visceral responses at this moment.

- A. Parasympathetic

B. Sympathetic

C. Thoraco-lumbar

D. All of the above

E. B and C only

49. Which one of the following is not true of the reticular formation?

- A. It extends throughout the brainstem.
- B. It receives impulses from some selected ascending sensory tracts as they pass through the medulla.
- C. It receives impulses from the cerebellum.
- D. Injury to this system may produce coma.
- E. It sends impulses to the cerebral cortex.

50. The secretion of hormones from the anterior lobe of the pituitary gland is largely controlled by:

- A. releasing factors from the hypothalamus.
- B. releasing factors from the thalamus.
- C. nerve impulses from the hypothalamus.
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45.Which one of the following is "not" true of both ordinary somatic efferent activity and autonomic function?

- A. The impulses pass through ventral roots of spinal nerves.
- B. The fiber emerging from the CNS releases acetylcholine at its endings.
- C. The cell body of the fiber emerging from the CNS lies in the lateral gray column of the spinal cord.

D. A pre and a post synaptic neuron exist between the spinal cord and the effector organ or muscle.

46.Which of the following is a true statement?

- A. Adrenalin or epinephrine is the hormone released by the adrenal gland during a stressful situation.**
- B. Noradrenaline/norepinephrine is the neurotransmitter released from post ganglionic neurons of the sympathetic nervous system.
- C. Both A and B
- D. neither A nor B

47.The preganglionic autonomic nerve fibers that arise from the thoracic and lumbar parts of the spinal cord:

- A. are also called preganglionic sympathetic fibers.**
- B. synapse with postganglionic fibers of the parasympathetic nervous system.
- C. form the dorsal roots of the thoracic and lumbar spinal nerves.
- D. are also called preganglionic parasympathetic fibers.

48.You've just consumed thanksgiving dinner; yes, even the green jell-o. Now you retreat to the couch, snuggle up under an afghan, and turn on the

interviews that precede the afternoon football game. The ? division of your autonomic nervous system is predominately in command of your visceral responses at this moment.

A. Parasympathetic

- B. Sympathetic
- C. Thoraco-lumbar
- D. All of the above
- E. B and C only

49.Which one of the following is not true of the reticular formation?

- A. It extends throughout the brainstem.
- B. It receives impulses from some selected ascending sensory tracts as they pass through the medulla.
- C. It receives impulses from the cerebellum.**
- D. Injury to this system may produce coma.
- E. It sends impulses to the cerebral cortex.

50.The secretion of hormones from the anterior lobe of the pituitary gland is largely controlled by:

- A. releasing factors from the hypothalamus.**
- B. releasing factors from the thalamus.
- C. nerve impulses from the hypothalamus.
- D. nerve impulses from the thalamus.

BRAIN 3 BRAIN STRUCTURE AND FUNCTION

DIRECTIONS: Read the questions carefully and pick the BEST CORRECT ANSWER. Then check your answer against the correct answers on the Key at the bottom of the page. Good luck.

1. Which of the following is NOT related to the cerebrospinal fluid?

- A. Provides a cushion and support for delicate neural tissues
- B. Its pressure is dependent upon blood pressure and volume of fluid it contains
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2. An impulse passing from the cerebrum to the cerebellum would necessarily pass through which of the following?
- A. midbrain
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- B. Arachnoid
- C. Pia mater

D. Bone

E. Scalp

D. epinephrine

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A. Sarcoplasmic reticulum.

B. reticular activating system.

C. Both A and B

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E. medial and temporal lobe of the cerebrum

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D. operating only when the body is not being subjected to stress (Fear, hunger, rage, pain).

E. of reflexes whose receptors are located within the actual organs involved.

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43. Which of the following situations would most likely be facilitated by the action of the primary motor area of the cerebral cortex?

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B. Seeing a jet 10,000 feet in the air above you.

C. Both A and B

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44. My new Pontiac is in the garage getting repaired by four mechanics wearing blue jeans and listening to the grateful dead. This interpretation is made by my:

A. Somesthetic cortex

B. Limbic system

C. Pre-frontal motor area

D. Gnostic area

E. Broca's area

48. Lesions of the limbic system may result in:

A. A voracious appetite

B. Constant feeling of sexual harassment from your boss

C. Perverse sexual activity

D. Bizarre sensual behavior

E. All of the above

45. Nuclei buried deep in the cerebrum that modify involuntary muscle movement are called the:

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46. Which of the following is NOT TRUE of the corticospinal tract?

A. Most of their neurons cross to the opposite side of the cord In the medulla

B. They carry motor nerve impulses

C. Their nerve cell bodies lie in the precentral gyrus

D. It begins at the premotor cortex of the cerebrum

50. A local mathematician, Lois Carmen Denominator, was attending an opera at the Kennedy Center. She heard Bertha D. Blues sing, she talked to a national politician, Warren Pease, and she smelled the wonderful fragrance from Polly Dendron. In what part of Lois' brain did the "whole picture" of the event come from?

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47. Damage to the association areas of the cerebral cortex would result in:

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B. Loss of cutaneous sensation

C. Paralysis

D. Loss of recognition abilities

E. Death

BRAIN-3 ANSWERS

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- A. Cerebral nuclei**
- B. Arbor vitae
- C. Pyramids
- D. Limbic system
- E. Corpora quadrigeminal

46. Which of the following is NOT TRUE of the corticospinal tract?

- A. Most of their neurons cross to the opposite side of the cord in the medulla
- B. They carry motor nerve impulses
- C. Their nerve cell bodies lie in the precentral gyrus

D. It begins at the premotor cortex of the cerebrum

47. Damage to the association areas of the cerebral cortex would result in:

- A. Loss of motor activity
- B. Loss of cutaneous sensation
- C. Paralysis
- D. Loss of recognition abilities**

E. Death

48. Lesions of the limbic system may result in:

- A. A voracious appetite
- B. Constant feeling of sexual harassment from your boss
- C. Perverse sexual activity
- D. Bizarre sensual behavior
- E. All of the above**

49. The fingers, thumb, and mouth are important in determining man's rank in the scale of evolution. This fact is represented functionally by which of the following?

- A. The representation of these areas in the motor cortex is Relatively large
- B. The representation of these areas in the sensory cortex is relatively large

C. Both A and B

D. Neither A nor B

50. A local mathematician, Lois Carmen Denominator, was attending an opera at the Kennedy Center. She heard Bertha D. Blues sing, she talked to a national politician, Warren Pease, and she smelled the wonderful fragrance from Polly Dendron. In what part of Lois' brain did the "whole picture" of the event come from?

- A. Frontal lobe of cerebral cortex
- B. Gnostic area of cerebral cortex**
- C. Auditory association area
- D. Visual association area
- E. None of the above

BRAIN 4 BRAIN STRUCTURE AND FUNCTION

DIRECTIONS: Read the questions carefully and pick the BEST CORRECT ANSWER. Then check your answer

against the correct answers on the Key at the bottom of the page. Good luck.

D. all of the above

E. A and B only

1. Parasympathetic effects

- A. prepare the body to resist stress
- B. lead to acceleration of body activity
- C. cause rage and strong emotional outbursts
- D. maintain normality of body functions
- E. all of the above

5. Which of the following is NOT a response to sympathetic stimulation?

- A. increased heart rate
- B. increased blood pressure
- C. increased motility of the digestive tract
- D. increased metabolism
- E. increased release of glucose from the liver

2. Roughly 75% of the parasympathetic outflow of nerve impulses is carried over the --?-- nerve.

- A. vagus
- B. brachial
- C. sciatic
- D. optic
- E. olfactory

6. Which of the following is NOT a correct statement about the parasympathetic division?

- A. the acetylcholine released is very short-lived
- B. most of the acetylcholine released becomes inactivated by cholinesterase
- C. epinephrine and norepinephrine are released by preganglionic and Postganglionic fibers of the parasympathetic division
- D. any acetylcholine diffusing into tissues is deactivated by tissue cholinesterase

3. With few exceptions, postganglionic sympathetic fibers release:

- A. adrenalin
- B. acetyl coenzymeA
- C. norepinephrine
- D. acetylcholine

7. Acting as an automatic processing center that directs postural reflexes and coordinates conscious and unconscious motor commands of the cerebral hemispheres, cerebral nuclei and brainstem, is a function of the:

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- A. length of the preganglionic and postganglionic neurons
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8. Which of the following is/are a TRUE statement?

A. anti diuretic hormone or ADH acts to increase the rate of filtration at the glomerulus of the kidney and thus causes more reabsorption of water.

B. the hypothalamus has both inhibitory and excitatory control over contraction of smooth muscle in the walls of the viscera

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9. The most important brain area for the control of visceral function and homeostasis is related to the activities of the:

A. hypothalamus

B. thalamus

C. medulla

D. cerebellum

10. What part of the brain is inactive when the RAS isn't stimulated?

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11. Which one of the following listed is passed **THIRDLY** by a nerve impulse?

A. Temporal lobe

B. Olfactory nerve

C. Olfactory bulb

D. Olfactory tract

12. Retention of sensory input for extremely short periods of time, as having the spinal cord "remember" how to respond to striking the patellar tendon, is called:

A. sensory memory.

B. short-term memory.

C. Both A and B

D. Neither A nor B

13. In the sensory homunculus, the portion of the post-central gyrus that receives that sensation from a particular part, the is the amount of interpretation from that part of the body.

A. greater; greater

B. lesser; less

C. both A and B

D. neither A nor B

14. If a patient exhibits irregular fluctuations in body temperature, loss of appetite, and lack of sensation of thirst, the portion of the brain that is probably not functioning properly is the:

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15. Activity within the RAS a person's general level of attentiveness.

A. decreases

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16. Drugs that mimic the effects of sympathetic stimulation are called:

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- A. heart rate
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18. Efferent neurons:

- A. can be clearly divided into four divisions
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22. Which of the following is a correct pathway for interpretation of communicated ideas?

- A. Midbrain -> auditory association area -> Wernicke's area -> gnostic area
- B. Primary auditory area -> auditory association area -> auditory motor area
- C. Both A and B
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19. The limbic system is important to all of the following except

- A. rage.
- B. aggression
- C. pleasure.
- D. sleeping.

23. Gluconeogenesis, acting to get --?-- from non-carbohydrate materials, is caused to occur through the action of --?-- secreted by the adrenal gland.

- A. energy - glucocorticoids
- B. glucose - cortisone
- C. Both A and B
- D. Neither A nor B

20. The ? helps attach the brain to the skull and prevents excess movement within the braincase.

- A. dura mater
- B. arachnoid

24. The --?-- fights the original stress of the "GAS" long after the initial alarm reaction is over.

- A. exhaustion stage
- B. resistance stage
- C. fight or flight response
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25. What chemical is released at synapses and neuroeffector junctions by all of the preganglionic and postganglionic fibers in the parasympathetic division?
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27. At what site does cerebrospinal fluid eventually mix with blood; that is, where is the cerebrospinal fluid returned to the blood circulation?
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28. The ability "to answer this question by hitting the correct key on the computer screen" is a motor activity promoted by:
- A. the cerebral medulla, i.e., the basal ganglia.
- B. the postcentral gyrus, and occipital lobes of the cerebrum.
- C. the precentral gyrus of the cerebrum, and the cerebellum.
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29. The control of voluntary motion in a very fine, meticulous way is in the of the cerebrum
- A. precentral gyrus
 - B. parietal lobe
 - C. temporal lobe
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30. ? is a relatively permanent change in learning resulting from experience.
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 - B. Short-term memory
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31. If you were discussing a money matter with your employer and the discussion turned ugly, that is, made both of you use 4-letter words, which part of your brain would recall that event at least a week or even a month later?
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 - C. Hypothalamus
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32. The ability to sense that a shower is running but not knowing how hot is the water, is an interpretation made by the:

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- A. an empty stomach stimulates the hunger nerves.
- B. a satiety center in the hypothalamus sends messages to the conscious centers of the brain.
- C. he becomes weak because the muscles lack sufficient food.
- D. a reduced glucose content of the blood stimulates the hunger center in the hypothalamus to urge eating.

34. The specialized circulatory system that receives releasing factors and carries them to the anterior pituitary gland for immediate impact, is the:

- A. systemic circulation.
- B. pulmonary circulation.
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35. An individual could distinguish the exhilaration of a tenor singing an operatic aria from the flashiness of the boys and men singing in a MCI center concert by the action of their:

- A. primary auditory area.
- B. Broca's area of the frontal lobe.
- C. Wernicke's area.

D. gnostic-auditory facilitation pathway.

E. All of the above

36. All EXCEPT which one of the following body activities are controlled by the cerebrum?

- A. Circulation of the blood to the brain
- B. Perception of moving objects in subdued light
- C. Deciding whether or not to put money into a parking meter
- D. Learning scientific names and associating them with particular organisms
- E. Manipulation of the fingers when scratching your nose

37. The working of reverberating circuits is one explanation for our ability to automatically control the

- A. rate of heart beating.
- B. rate of breathing.
- C. patellar or knee jerk reflex.
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38. A local PG politician, Jerry Mander knows just where his hands are when he's trying to get a bill through the Maryland senate. He waves them around, often jesting to his colleagues to support his measures. This ability to understand the spatial representation of his arms is a function of the:

- A. precentral gyrus.
- B. prefrontal cortex.
- C. postcentral gyrus.
- D. somesthetic association area.
- E. temporal lobe.

39. The transverse fissure:

- A. separates the cerebral hemispheres from each other.
- B. separates the cerebrum from the cerebellum.
- C. is located near areas associated with the sense of pain.
- D. is located near areas with centers for speech and hearing.

40. What part of the brain is not alerted if the RAS is not stimulated?

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41. A person feels "nervous" before going in to take her test on the nervous system. Palms are sweaty and heart rate is increased. The part of the brain involved in these body responses is the:

- A. pons.
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- D. hypothalamus.
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42. Which of the following does NOT protect the brain from injury or harmful substances?

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48. Commissural fibers connect:

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- C. serves as center for language and memory.
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BRAIN 5 BRAIN STRUCTURE AND FUNCTION

DIRECTIONS: Read the questions carefully and pick the **BEST CORRECT ANSWER**. Then check your answer against the correct answers on the Key at the bottom of the page. Good luck.

1. The knowledge that the light switch is on the far wall of the lecture hall in the science building was made because you previously turned it on from there. What part of your brain did you use to recall that point in your memory?

- A. Visual association area
- B. Primary motor area
- C. Somesthetic association area
- D. Premotor area
- E. None of the above

2. The famous sobbing sisters, Maude Lynn and Wella Baulsome were often in their dreary moods. They complained a lot and griped often to their teacher. They seldom smiled in class. This moodiness reflects their:

- A. complexion and expression.
- B. personality and emotions.
- C. wise judgements and decision making processes.
- D. all of the above
- E. none of the above

3. --?-- memory involves the retention of facts such as names, dates, and places.

- A. Sensory
- B. Short-term
- C. Both A and B
- D. Neither A nor B

4. The visual association area:

- A. interprets written language by distinguishing shapes of letters in words.
- B. interprets what a sentence means when it comes over the radio.
- C. would be used to identify the location of the pons vs the thalamus on a model of the brainstem.
- D. All of the above
- E. A and C only

5. Because anti-diuretic hormone --?-- the amount of water in the blood, the blood pressure __?__.

- A. increases; increases
- B. increases; decreases
- C. decreases; increases
- D. decreases; decreases

6. Stimulation of what area produces the sensations of touch, pressure, pain, taste and temperature?

- A. Olfactory cortex
- B. Auditory cortex
- C. Primary motor cortex
- D. Primary somesthetic cortex

7. Which of the following are paired correctly?

- A. Primary motor area = postcentral gyrus
- B. Central sulcus = central fissure
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A. wise judgement

B. emotions

C. sense of projection

D. personality

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B. reasoning.

C. judgements.

33. Destruction of the postcentral gyrus of the left cerebral cortex results in loss of:

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- A. The resistance stage of the general adaptation syndrome usually corrects the stress and brings the individual back to normal balance
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- E. promotes secretion of adrenalin from the adrenal gland
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- B. Hypothalamus
- C. Pons
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=====

A. 1, 2

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45. The ability to know that the test you are taking is on white bond paper, and that you are holding a pencil in your hand, and that the two are distinctly different is called:

A. association.

B. clarification.

C. modality.

D. adaptation.

E. projection.

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A. learning.

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BRAIN-5 ANSWERS

1. The knowledge that the light switch is on the far wall of the lecture hall in the science building was made because you previously turned it on from there. What part of your brain did you use to recall that point in your memory?

- A. Visual association area
- B. Primary motor area
- C. Somesthetic association area**
- D. Premotor area
- E. None of the above

2. The famous sobbing sisters, Maude Lynn and Wella Baulsome were often in their dreary moods. They complained a lot and griped often to their teacher. They seldom smiled in class. This moodiness reflects their:

- A. complexion and expression.
- B. personality and emotions.**
- C. wise judgements and decision making processes.
- D. all of the above
- E. none of the above

3. --?-- memory involves the retention of facts such as names, dates, and places.

- A. Sensory
- B. Short-term
- C. Both A and B
- D. Neither A nor B**

4. The visual association area:

- A. interprets written language by distinguishing shapes of letters in words.
- B. interprets what a sentence means when it comes over the radio.
- C. would be used to identify the location of the pons vs the thalamus on a model of the brainstem.
- D. All of the above
- E. A and C only**

5. Because anti-diuretic hormone --?-- the amount of water in the blood, the blood pressure __?__.

- A. increases; increases**
- B. increases; decreases
- C. decreases; increases
- D. decreases; decreases

6. Stimulation of what area produces the sensations of touch, pressure, pain, taste and temperature?

- A. Olfactory cortex
- B. Auditory cortex
- C. Primary motor cortex
- D. Primary somesthetic cortex**

7. Which of the following are paired correctly?
- A. Primary motor area = postcentral gyrus
 - B. Central sulcus = central fissure
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- A. sensory areas of the cerebrum.
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- E. hypothalamus.

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BRAIN 6 BRAIN STRUCTURE AND FUNCTION

DIRECTIONS: Read the questions carefully and pick the BEST CORRECT ANSWER. Then check your answer against the correct answers on the Key at the bottom of the page. Good luck.

- 1. Because anti-diuretic hormone ? the amount of water in the blood, the pressure applied upon the blood by the heart ?.
 - A. increases; increases
 - B. increases; decreases
 - C. decreases; increases
 - D. decreases; decreases
- 2. Abnormal body movements, such as uncontrollable shaking, and involuntary movements of the skeletal muscles probably indicate damage to the:

- 3. Which of the following secrete acetylcholine as a chemical transmitter?
 - A. parasympathetic pre-ganglionic neurons
 - B. sympathetic pre-ganglionic neurons
 - C. somatic motor neurons
 - D. parasympathetic post-ganglionic neurons
 - E. all of the above
- 4. Destruction of the entire postcentral gyrus of the left cerebral cortex results in loss of:
 - A. reflexes on the right side of the body.
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 - C. voluntary movements on the right side of the body.
 - D. All of the above
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 - A. sympathetic nervous system
 - B. parasympathetic nervous system
 - C. adrenal Cortical hormones
 - D. thyroidal hormones
 - E. pituitary hormones

6. Which of the following is/are actions promoted by the sympathetic nervous system?

- A. vasodilation of arteries in the skin during stress
- B. dilation of bronchioles of lungs
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- E. Thalamus
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- B. one cerebral hemisphere to another.
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- A. reflexes on the right side of the body.
- B. touch sensations on the right side of the body.**
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BRAIN-6 ANSWERS

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- A. increases; increases**
- B. increases; decreases
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- B. basal ganglia (cerebral nuclei).**
- C. association areas of the cortex.
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- B. parasympathetic nervous system
- C. adrenal Cortical hormones
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