

Multiple choice review questions:

- 1) **The entire nervous system is divided into two main regions: The _____**
 - A) Brain and the spinal chord
 - B) CNS and the PNS
 - C) Neurons and the glial cells
 - D) Motor neurons and the sensory neurons
- 2) **All the nervous tissue outside the brain and spinal cord is the _____ nervous system.**
 - A) Peripheral
 - B) Autonomic
 - C) Somatic
 - D) Central
- 3) **Which of the following is not one of the basic functions of the nervous system?**
 - A) Formulate responses to sensory stimulation
 - B) Send signals rapidly between body parts
 - C) Produce major body fluids such as plasma and interstitial tissue fluid
 - D) Detect sense stimuli
- 4) **The cells of nervous tissue that are not neurons but that assist neurons are called**
 - A) Amyloid plaques
 - B) Fibroblasts
 - C) Leukocytes
 - D) Neuroglia

- 5) **The white fatty substance that coats axons to increase signal speed is**
- A) Myelin
 - B) Microfibrils
 - C) Dendrites
 - D) Adipocytes
- 6) **One example of a function of neuroglial cells is to...**
- A) Add myelin to axons
 - B) Produce neurotransmitters
 - C) Bind neurotransmitters
 - D) Link one neuron cell to another at the synapse
- 7) **_____ neuron transmits signals from the PNS to the central nervous system.**
- A) Interneuron
 - B) Sensory
 - C) Motor
 - D) Ganglion
- 8) **An involuntary response by the nervous system to a stimulus is a**
- A) Synapse B) Reflex
 - C) Motor response
 - D) Smooth muscle
- 9) **The axon has voltage gated ion channels. The term "voltage gated" means that...**
- A) Ion channels open and close because of changes in the neuron's voltage
 - B) Neuron voltage is controlled by neuroglial cells
 - C) Ion gates will not respond unless the neuron is in the CNS
 - D) Voltage can only be controlled by a reflex

- 10) Both the depolarization and repolarization changes that occur during the action potential are produced by
- A) Ions moving across the cell membrane
 - B) Small neuroglial cells that act as batteries for the neuron itself
 - C) Negative stimuli
 - D) Enzymes creating new ions
- 11) The movement of K^+ out of the cell makes the inside of the cell less positive (more negative) and acts to restore the original resting voltage of the neuron -a process called
- A) Depolarization
 - B) Hyperpolarization
 - C) Repolarization
 - D) Overshoot
- 12) Arrange these action potential events in their proper sequence:
- (1) The neuron is stimulated at the dendrites
 - (2) K^+ gates open
 - (3) The neuron is in a polarized “resting” state
 - (4) Na^+ gates open
 - (5) The cell is fully depolarized
 - (6) The cell is fully repolarized
- A) 1, 2, 4, 3, 5, 6
 - B) 3, 1, 4, 5, 2, 6
 - C) 4, 6, 2, 1, 5, 3
 - D) 1, 4, 2, 6, 5, 3

- 13) **When the neurotransmitter molecules released from the axon terminals of a neuron have diffused across the synapse and have reached the dendrites of the target neuron, the neurotransmitters**
- A) Enter the target neuron by membrane transport proteins (ion channels)
 - B) Diffuse out of the synapse without causing any response in the target neuron
 - C) Bind to receptor proteins
 - D) Stimulate neuron growth
- 14) **When a neurotransmitter binds to a receptor on the target cell, it causes the target cell to have a (n)...**
- A) Repolarization
 - B) Growth phase
 - C) Growth inhibition
 - D) Action potential
- 15) **A bundle of axons in the PNS is called a**
- A) Tract.
 - B) Nerve
 - C) Nucleus
 - D) Ganglion
- 16) **The right and left halves of the cerebrum (the cerebral hemispheres) are connected to each other mainly by a bundle of neuron axons called the**
- A) Thalamus.
 - B) Insula.
 - C) Corpus cavernosum.
 - D) Corpus callosum.

17) Which are not areas of the cerebrum?

- A) Sensory signal receiving areas
- B) Heart rate and breathing rate control areas
- C) Logic and language areas
- D) Motor signal generating areas

18) Sensations from the skin are converted to perceptions in which part of the cerebrum?

- A) the primary motor area
- B) the primary sensory area
- C) Wernicke's area
- D) Broca's area

19) Signals from the sense organs(such as the ears, eyes, nose, and mouth) are received and analyzed in what part of the brain?

- A) The cerebellum
- B) The cerebrum
- C) The brainstem
- D) The diencephalon

20) The area of the brain responsible for conscious thought, intellect, memory storage and processing, controlling the movement of skeletal muscles, and sensation is the

- A) thalamus.
- B) cerebellum.
- C) medulla oblongata.
- D) cerebrum.

- 21) Emotions, regulation of sleep, wakefulness, sexual arousal, thirst, hunger, body temperature, and production of certain hormones are all functions of what structure of the brain?
- A) Hypothalamus
 - B) Thalamus
 - C) Cerebrum
 - D) Cerebellum
- 22) This brain area is a routing center for incoming sense signals
- A) Cerebellum
 - B) Brain stem
 - C) Thalamus
 - D) Spinal cord
- 23) The hypothalamus does *not* contain a control center for the homeostatic regulation of
- A) Body temperature.
 - B) Various emotional states.
 - C) Urination
 - D) Eating.
- 24) The region of the CNS that contains the vital centers for regulating breathing rate, heart rate, and blood pressure is the
- A) Thalamus.
 - B) Cerebrum.
 - C) Medulla oblongata.
 - D) Cerebellum.

- 25) **Damage to the cerebellum causes**
- A) Uncontrollable hunger
 - B) Coma.
 - C) Loss of speech
 - D) Loss of balance
- 26) **The spinal cord contains tracts of inter neurons. Some tracts carry _____ signals downward and other tracts carry _____ signals upward.**
- A) Cardiac, Motor
 - B) Sensory, Autonomic
 - C) Sensory, Motor
 - D) Motor, Sensory
- 27) **The PNS contains these types of neurons (two answers)**
- A) Sensory
 - B) Inter neurons
 - C) Motor neurons
 - D) Neuroglial neurons
- 28) **Somatic motor neurons have axons that conduct signals from the CNS to ____; and are usually under _____ control.**
- A) Skeletal muscle; involuntary
 - B) Hollow organs; voluntary
 - C) Hollow organs; involuntary
 - D) Skeletal muscle; voluntary

- 29) **Involuntary muscles and glands are innervated (stimulated by) neurons of the _____ nervous system**
- A) autonomic
 - B) somatic
 - C) sensory
 - D) central
- 30) **Targets of the autonomic nervous system include all of the following except**
- A) cardiac muscle.
 - B) glands.
 - C) skeletal muscle.
 - D) smooth muscle in hollow organs.
- 31) **The two major divisions of the ANS are**
- A) Peripheral and Central nervous systems
 - B) Voluntary and involuntary muscles
 - C) Sympathetic and parasympathetic
 - D) Neurons and neuroglia
- 32) **Which ANS division is more active when we are relaxed and peaceful?**
- A) Parasympathetic
 - B) Voluntary
 - C) Peripheral
 - D) Central

- 33) The "fight or flight" response is the term used to describe activation of the ____.
- A) Parasympathetic division
 - B) Sympathetic division
 - C) Somatic nervous system
 - D) CNS
- 34) Motor signals in the ANS always pass through ____ (a number) motor neuron(s) before reaching a muscle. Motor signals in the SNS always pass through ____ (a number) motor neuron(s) before reaching a muscle.
- A) 2, 2
 - B) 2, 1
 - C) 1, 3
 - D) 1, 2
- 35) The ganglia of the ____ division are closer to the spine than the ganglia of the ____ division.
- A) Sympathetic, Parasympathetic
 - B) Parasympathetic, Peripheral
 - C) Sympathetic, Peripheral
 - D) Parasympathetic, Sympathetic
- 36) The effects of sympathetic and parasympathetic neurons on the heart can best be described as
- A) antagonistic.
 - B) identical
 - C) cooperative.
 - D) adrenergic

- 37) In general, parasympathetic activation will produce effects that are _____ to those produced by activation of sympathetic neurons.
- A) similar
 - B) antagonistic
 - C) complimentary
 - D) identical
- 38) Which of the following releases norepinephrine as a neurotransmitter?
- A) preganglionic sympathetic neurons
 - B) postganglionic sympathetic neurons
 - C) preganglionic parasympathetic neurons
 - D) postganglionic parasympathetic neurons
- 39) All motor neurons release acetylcholine as a neurotransmitter except
- A) Postganglionic sympathetic neurons
 - B) Somatic motor neurons
 - C) Postganglionic parasympathetic neurons
 - D) Specific cardiac and smooth muscle fibers.
- 40) When the parasympathetic system is stimulated, what neurotransmitter is released?
- A) Acetylcholine
 - B) Norepinephrine
 - C) Epinephrine
 - D) Dopamine

41) Which of the following statements is true for preganglionic sympathetic neurons of the ANS?

- A) They are longer than postganglionic sympathetic neurons.
- B) They receive signals from interneurons
- C) They release norepinephrine.
- D) They synapse with muscles

42) Sensory neurons have the shape shown below on the left. The name of this neuron shape is _____. Most motor neurons and interneurons have the shape shown below on the right. The name of this neuron shape is _____.



- A) Unipolar neuron & Unipolar neuron C) Unipolar neuron & Multipolar neuron
 - B) Multipolar neuron & Unipolar neuron D) All the above
- 43) Sensory nerve signals converge in the _____, where they are sorted and relayed to the proper sensory areas of the cerebrum for interpretation.
- A) Pons B) Thalamus C) Medulla D) All

- 44) Name ventricles A and B shown below. (Hint: Ventricles names are numbers).



- A) 3rd & 4th ventricles B) 2nd & 4th Ventricles
- C) 1st & 2nd ventricles D) 2nd & 3rd ventricles
- 45) The dendrites of a neuron contain _____, which allow the neuron to bind to and respond to neurotransmitters
- A) Myelin B) Receptor proteins C) Na⁺ and K⁺ ions D) None

Answers to multiple choice questions:

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

13 = C 14 = D 15 = B 16 = D 17 = B 18 = B 19 = B 20 = D 21 = A 22 = C 23 = C

24 = C 25 = D 26 = D 27 = A and C 28 = D 29 = A 30 = C 31 = C 32 = A 33 = B

34 = B 35 = A 36 = A 37 = B 38 = B 39 = A 40 = A 41 = C 42 = C 43 = B 44 = A

45 = B