NERVOUS SYSTEM

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 neuroglial

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 inter neurons
- 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 inter neurons 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

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



A) 3^{rd} & 4^{th} ventricles

B)2nd & 4th Ventricles

C) 1^{st} & 2^{nd} ventricles D) 2^{nd} & 3^{rd} 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:

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

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

45 = B

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