

Nervous System Review ANSWERS

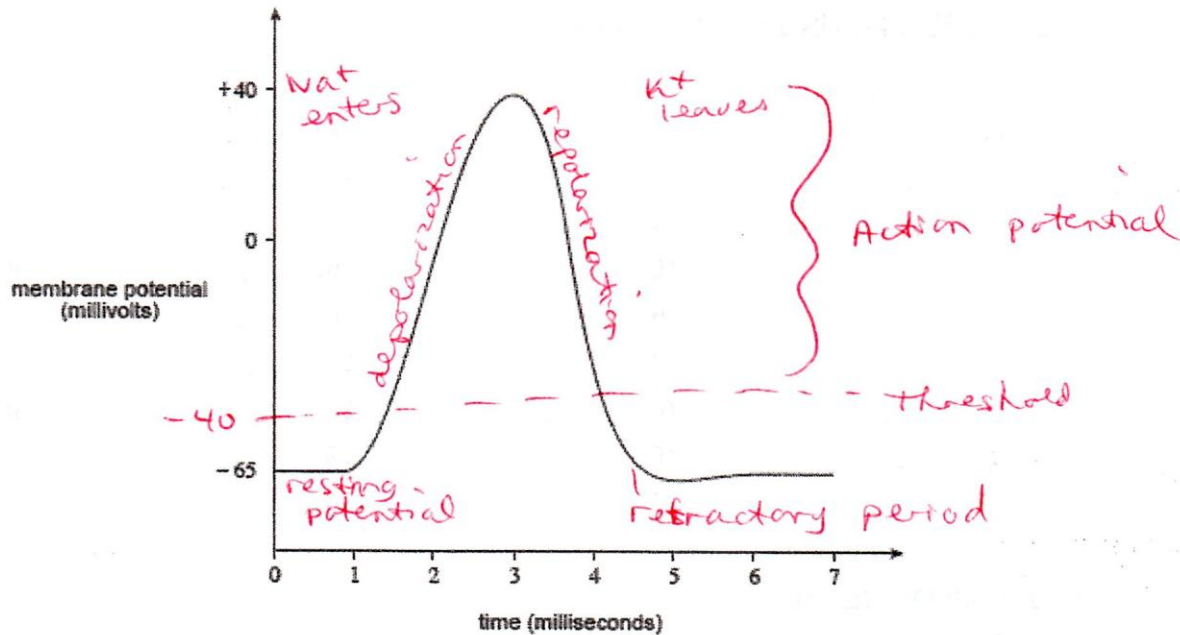
1. Know the structure, function and location of a sensory neuron, interneuron, and motor neuron

2. What is (a)

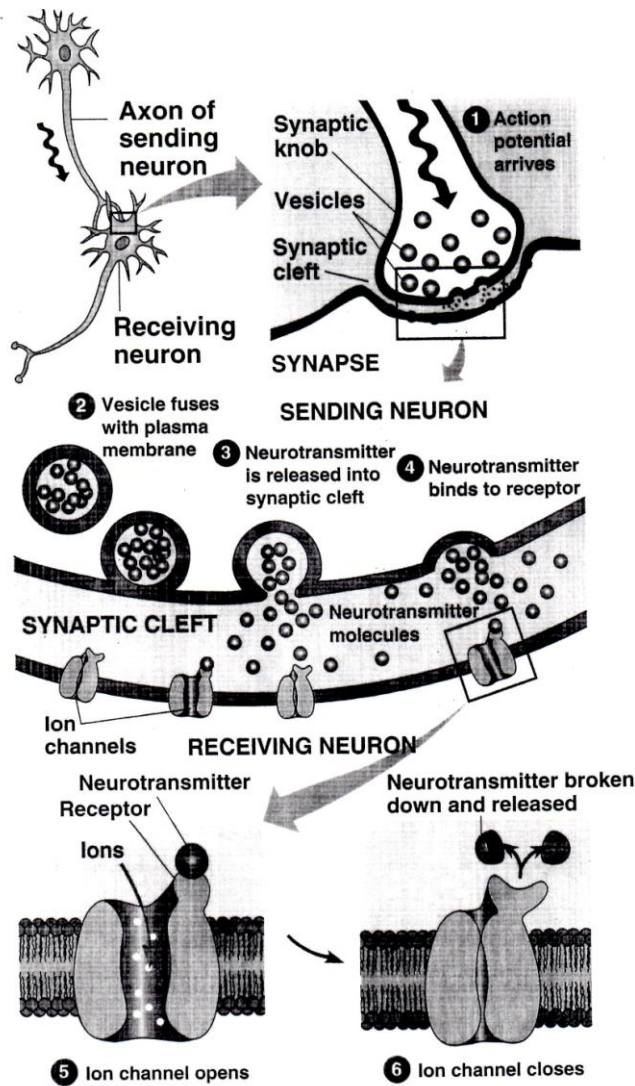
- Neuron
- Nerve impulse
- Receptor
- Stimuli
- Effector
- Cell body
- Dendrite
- Axon
- Axoplasm
- Axomembrane
- Schwann cell
- Myelin
- Ganglia

See quizlet for this information

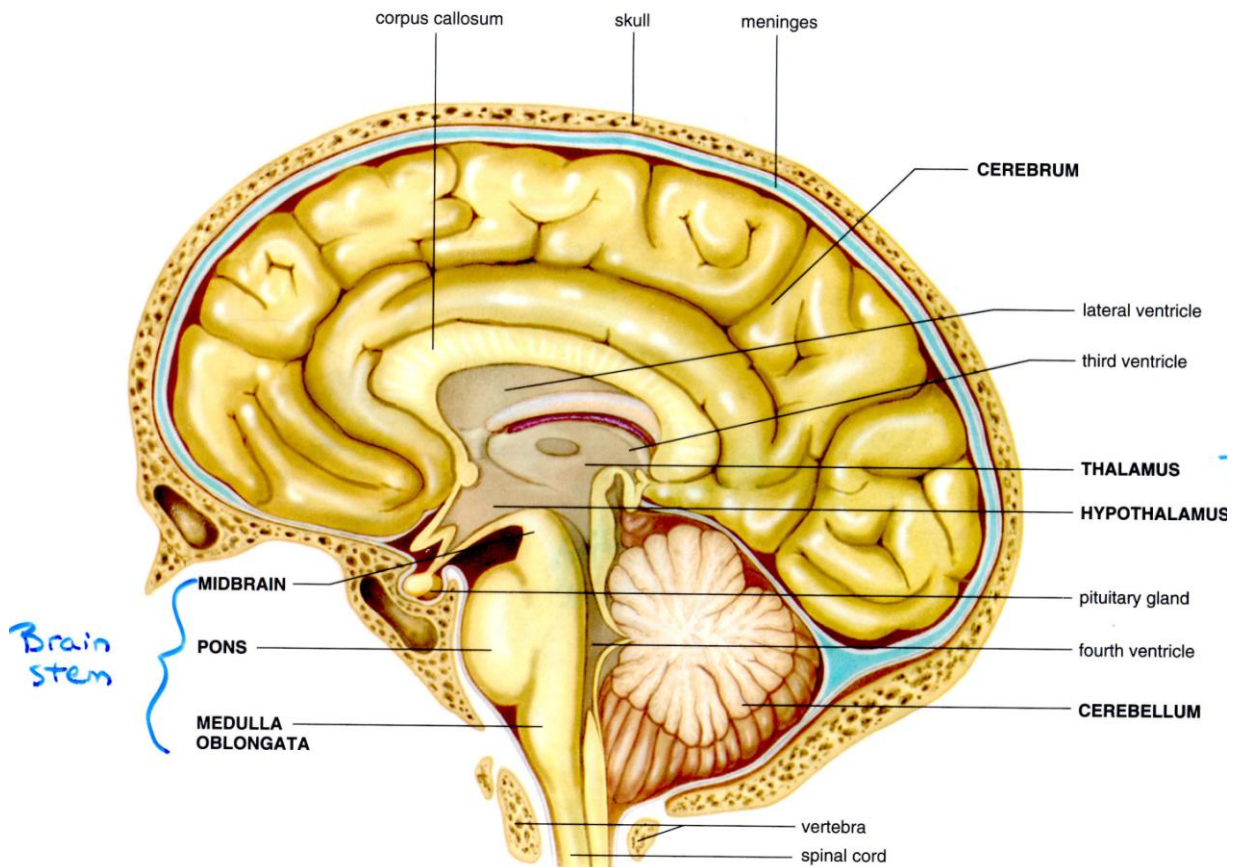
3. What is the sodium potassium pump? **The protein that is active during the refractory/recovery period of an action potential in order to restore the sodium and potassium to its original levels (pumps 3 sodium out of a neuron and 2 potassium into the axoplasm of a neuron)**
4. What is diffusion? **The passive movement of substances from an area of high concentration to an area of low concentration** Exocytosis? **The process of a vesicle fusing with the cell membrane to release the vesicle contents. In the NS, the vesicle is filled with a neurotransmitter that is released into the synaptic cleft.**
5. Know the parts of a nerve impulse – action potential – know the graph



6. What is the function of myelin? **To insulate the neuron (dendrite or axon) to allow for the action potential to move quickly along the neuron (as it jumps from node to node)**
7. What is polarity? A charge differential across a membrane
8. Explain the process of synaptic transmission. Know the diagrams

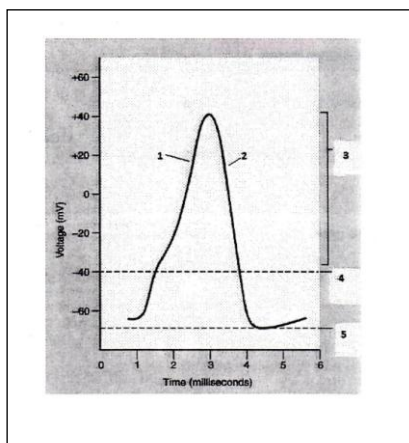


9. What ion is important for synaptic transmission to occur? **Ca²⁺**
10. What enzyme breaks down acetylcholine? **Acetylcholinesterase** Norepinephrine? **Monoamine oxidase**
11. If a neurotransmitter is not broken down by an enzyme, what happens to it? **It will continually bind to its receptor on the post-synaptic membrane and if excitatory, will stimulate the neuron by opening the Na⁺ channels and if inhibitory, will hyperpolarizes the post-synaptic cell.**
12. What is integration? **The summing up of all neuronal information to determine appropriate response.**
13. What are the two main divisions of the nervous system? **Central nervous system (CNS) and the Peripheral nervous system (PNS)**
14. What are the two parts of the central nervous system? **The brain and the spinal cord**
15. Explain the difference between the voluntary and involuntary nervous system? **Voluntary requires conscious control over and involuntary occurs automatically without our conscious thought.**
16. Explain the difference between the somatic and autonomic nervous system? **Somatic involves voluntary control of motor and sensory functions and autonomic is the involuntary control.**
17. Explain the difference between the sympathetic and parasympathetic system? **sympathetic is the division of the nervous system involuntarily initiated in stressful situations (fight and flight) whereas the parasympathetic is the involuntary response that is in play during rest (rest and digest).**
18. How is the central nervous system protected and cushioned? **By bones and meninges.**
19. What is the difference between gray and white matter? White matter contains myelinated neuronal parts whereas gray matter is the unmyelinated portions.
20. Know the diagram of the brain



21. What is an endocrine gland? **Organ that secretes hormones directly into the blood (compared to secreting hormones through a duct)**
22. What is the neuroendocrine control centre. **The hypothalamus**
23. Explain the 2 ways that the hormones involved in homeostasis are controlled. **Through negative feedback (when "enough" of the hormone has been produced, it will stop the production of more of it) and through other hormones that have the opposite function**
24. What 2 hormones are stored and released by the posterior pituitary gland? Where are they made? **Antidiuretic hormone (ADH) and oxytocin – both produced in the hypothalamus and stored in the posterior pituitary.**
25. What hormones are released from the anterior pituitary? **ACTH, TSH, FSH, LH, GH, prolactin & melatonin.** How are they regulated? **Through negative feedback**
26. Why do nerve impulses not move backwards? **Depolarization of the membrane moves in one direction and directly behind it, the membrane will be repolarizing which means the K⁺ gates will be open but the Na⁺ gates are closed. So, only the voltage-gated ion channels proceeding forward can be opened, not the ones behind the action potential.**
27. Which is **not** a correct association of structure and function?
 - A. Axons-- outgoing signals
 - B. Sensory neuron-- delivers signals to control sensory organs such as eye movement**
 - C. Cell body – nucleus and organelles
 - D. Dendrites – incoming signals
 - E. Interneuron – sums up in put before sending signals to muscle or gland
28. Dendrites
 - A. Carry impulses away from a cell body
 - B. Are always myelinated
 - C. Are found only in the CNS
 - D. Are solely responsible for nervous conduction
 - E. Carry impulses toward a cell body**

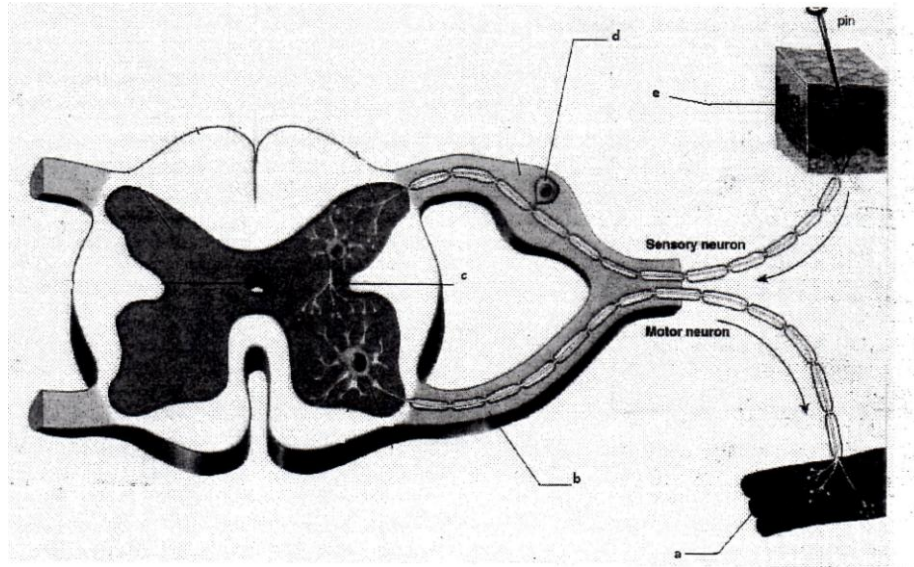
29. Damage to one nerve results in lack of control to the wrist and also numbness. This indicates that:
- The nerve contained sensory neurons
 - The nerve contained motor neurons
 - The nerve contained both sensory and motor neurons**
 - The damage was to a central body in a ganglion
 - The damage was to the spinal cord interneuron
30. In the axon, the nerve impulses travel
- Toward the cell body
 - Away from the cell body**
 - In both directions
 - Away from the synapse
31. In a dissection, most nerve fibers appear gray and white because
- The neuron is gray or white coloured
 - Sodium ions are part of the salt compound and they flow along the surface
 - They rapidly die and dead tissues soon become gray or white
 - It is mostly myelin sheath made of lipid or fat**
32. Which of the following structures does **NOT** pertain to neurons?
- Hypothalamus**
 - Schwann cells
 - Myelin
 - Nodes of Ranvier
 - Effector
33. The sodium-potassium pump is primarily responsible for the
- Resting potential**
 - Action potential
 - Excretion of salts
 - Contraction of muscle fibres
 - Maintaining isotonic water balance
34. A nerve impulse is
- Movement of a sodium ion all the way from dendrite to axon tip
 - Movement of a potassium ion all the way from dendrite to axon tip
 - Movement of an electron all the way from dendrite to axon tip
 - A change in the difference in positive and negative ions on the surfaces of the neuron membrane, a charge that opens adjacent channels and propagates its flow**
35. The difference between a weak stimulus and an intense stimulus is
- The action potential is graduated and a weak stimulus causes a small change in polarity
 - Weak stimuli only open sodium gates, strong stimuli also open potassium gates
 - The axon fires at a greater frequency**
 - A strong stimulus does not allow repolarization but sends a constant flow of ions
 - All of the above are correct



36. In the diagram above of a nerve impulse, number 1 indicates the movement of
- Na^+ to the inside**
 - Na^+ to the outside
 - K^+ to the inside
 - K^+ to the outside
37. In the diagram above, number 2 indicates the movement of
- Na^+ to the inside
 - Na^+ to the outside
 - K^+ to the inside
 - K^+ to the outside**
38. In the diagram above, number 3 represents
- Depolarization
 - Repolarization
 - Action potential**
 - Threshold
 - Resting potential

39. In the diagram above, number 5 represents
- A. Depolarization
 - B. Repolarization
 - C. Action potential
 - D. Threshold
 - E. Resting potential**
40. Which statement is NOT true about the development of an action potential?
- A. There is a rapid change in polarity from about -65mV to about + 40 mV
 - B. It can be produced by an electric shock or a sudden change in pH
 - C. The action potential ends when the polarity across the membrane reaches +40mV**
 - D. Depolarization occurs when sodium gates open and allow sodium ions to enter the cell
 - E. Potassium gates open after the sodium gates and allow potassium ions to leave the cell
41. At a synapse
- A. A synaptic vesicles fuse with the post synaptic membrane
 - B. Synaptic vesicles fuse with the presynaptic membrane
 - C. Neurotransmitters diffuse across the synaptic cleft
 - D. Neurotransmitters are actively transported across the synaptic cleft
 - E. Synaptic vesicles fuse with the presynaptic membrane, and neurotransmitters diffuse across the synaptic cleft**
42. Neurotransmitters are molecules that cross the synaptic cleft and
- A. Always inhibit the postsynaptic neuron
 - B. Always excite the postsynaptic neuron
 - C. Either excite or inhibit the postsynaptic neuron**
 - D. Integrate the presynaptic action potential
 - E. Are carried along the membrane surface of the next neuron
43. The likely effect on a neuron of two excitatory signals and twenty inhibitory signals is
- A. Transmission of a nerve impulse
 - B. Transmission of a nerve impulse releasing inhibitory neurotransmitters at the next synapse
 - C. Prohibiting the axon from firing at all**
 - D. Confused integration
44. The enzyme that breaks down acetylcholine within the synaptic cleft is
- A. Acetylcholinesterase**
 - B. Monoamine oxidase
 - C. Lipase
 - D. Maltase
45. The primary functions of the spinal cord involve
- A. Intelligence and memory
 - B. Speech, taste, smell, vision, and hearing
 - C. Reflex actions and communication between the brain and spinal nerves**
 - D. Controlling muscle activity and maintaining balance
 - E. Local control and decision-making for local anatomy

46. A nerve is
- A. A neuron**
 - B. Composed of sensory axons and motor dendrites
 - C. Composed of the long fibres of long axons
 - D. A part of the central nervous system
 - E. Any cell located in the brain or spinal region
47. A reflex action
- A. Is an automatic, involuntary response**
 - B. Does not require the CNS
 - C. Is normally controlled consciously
 - D. Has no protective value
 - E. Is only found in humans
48. Which part of a simple reflex takes the message away from the CNS?
- A. Sensory neuron
 - B. Receptor
 - C. Interneuron
 - D. Motor neuron**
 - E. Effector
49. Administration of norepinephrine would
- A. Dilate the bronchi and increase oxygen for blood**
 - B. Slow heartbeat
 - C. Stimulate the digestive system to supply more sugar to the blood
 - D. Cause the pupil of the eye to contract
 - E. Promote an overall relaxed state
50. Which of these is NOT true of the autonomic nervous system?
- A. It controls heartbeat, peristalsis, and secretion of glands
 - B. It is composed of sympathetic and parasympathetic systems
 - C. It is composed only of fibres that have an inhibitory function on various organs of the body**
 - D. The impulses require two motor neurons to reach their destination
 - E. The system coordinates organ responses
51. Which of these phrases is mismatched?
- A. Synaptic vesicles – neurotransmitters
 - B. Ganglia – cell bodies outside the CNS
 - C. Autonomic nervous system – mixed nerves
 - D. Nodes of Ranvier – myelinated regions of a nerve**
 - E. Membrane potential – Na^+ and K^+
52. For the most part it is proper to associate the
- A. Sympathetic nervous system with acetylcholine and emergencies
 - B. Parasympathetic nervous system with norepinephrine and emergencies
 - C. Sympathetic nervous system with norepinephrine and emergencies**
 - D. Parasympathetic nervous system with acetylcholine and emergencies
 - E. Sympathetic nervous system with feelings of compassion and sympathy
53. The membranes that protect the brain and spinal cord are called
- A. Cerebrospinal membranes
 - B. Meninges**
 - C. Ventricles
 - D. Epithelium
 - E. Gray matter



54. In the diagram above, the structure at “a” is a(n);
 A. Interneuron
 B. Sensory neuron
 C. Receptor
 D. Motor neuron
E. Effector
55. In the diagram above, the structure at “b” is a(n)
 A. Interneuron
 B. Sensory neuron
 C. Receptor
D. Motor neuron
 E. Effector
56. In the above diagram, the structure at “c” is a(n):
A. Interneuron
 B. Sensory neuron
 C. Receptor
 D. Motor neuron
 E. Effector
57. In the above diagram, the structure at “d” is a(n):
 A. Interneuron
B. Sensory neuron
 C. Receptor
 D. Motor neuron
 E. Effector
58. Which part of the brain contains centers for the heartbeat and respiration
A. Medulla oblongata
 B. Hypothalamus
 C. Cerebellum
 D. Cerebrum
 E. Pons
59. An impulse travelling up the spinal cord first enters the brain at the
A. medulla oblongata
 B. Thalamus
 C. Hypothalamus
 D. Cerebellum
 E. Cerebrum
60. Which one is not DIRECTLY needed for nerve conduction?
 A. Dendrites
 B. Axons
 C. Cell membrane
D. Nucleus
 E. Ions
61. Which one does NOT move during nerve conduction?
 A. Sodium
 B. Potassium
 C. Positive charges
D. Negative charges
62. Which one is the opposite of the true situation for a resting neuron?
 A. Positive on both sides of the membrane
 B. Positive on outside of the membrane and negative on inside
 C. Negative on both sides of the membrane

D. Negative on the outside and positive and the inside

63. Which one has nothing to do with an action potential

- A. A resting potential
- B. Permeability of specific ions
- C. A Na/K pump
- D. A cell membrane
- E. Glycogen**

64. Fill in the table to indicate the functions of the brain

AREA OF THE BRAIN	FUNCTION
Cerebrum	Consciousness, intellect, memory, integration, coordinates brain
Thalamus	Sorting & relay station Directs input to correct part of brain for interpretation
Hypothalamus	Maintains homeostasis Neuroendocrine control center Make ADH & oxytocin
Cerebellum	Balance, posture, coordination, muscle tone
Medulla oblongata	Vital center – heartbeat, BP, breathing Reflex centers – vomiting, coughing, hiccupping
Corpus callosum	Allows 2 sides of brain to communicate
Meninges	Membranes filled with cerebrospinal fluid to protect & cushion brain
Anterior pituitary gland	Makes hormones – TSH, ACTH, GH, FSH, LH
Posterior pituitary gland	Stores hormones made by hypothalamus & releases them – ADH & oxytocin

65. Label the following diagrams

