

Homeostasis Unit Review Sample Answers

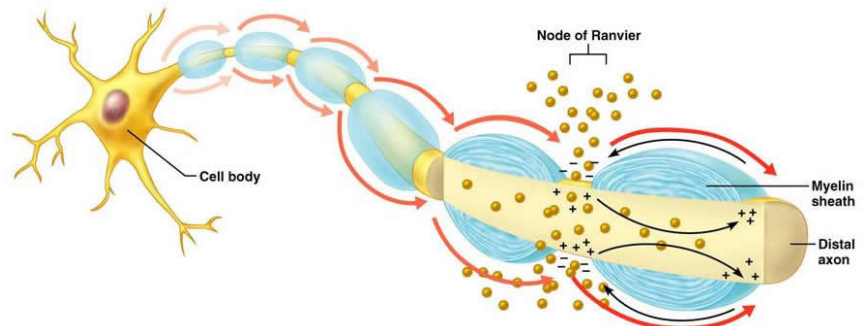
P. 561 #25-26

- | | |
|-----------|-------------|
| 25. (a) v | 26. (a) iii |
| (b) i | (b) v |
| (c) ii | (c) i |
| (d) iv | (d) ii |
| (e) iii | (e) iv |

- 27-28
27. reception; transmission; integration; response
28. afferent; interneurons; efferent

29. The myelin sheath does not allow the passage of ions.

30 Nodes of Ranvier are unmyelinated sections along the axon. They allow for salutatory conduction (jumping of action potential from node to node) which speeds up conduction/transmission of action potential.



Refractory Periods

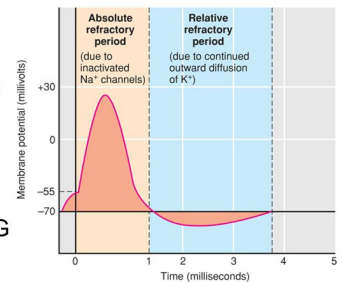
32 Refractory periods ensure that action potentials only travel in one direction. It also allows the neuron to adjust and limit the number of action potentials that can be sent

33. a) -50 mv
 b) When threshold is met, sodium channels open and allow sodium to flow into the axon.

▶ Absolute refractory period:

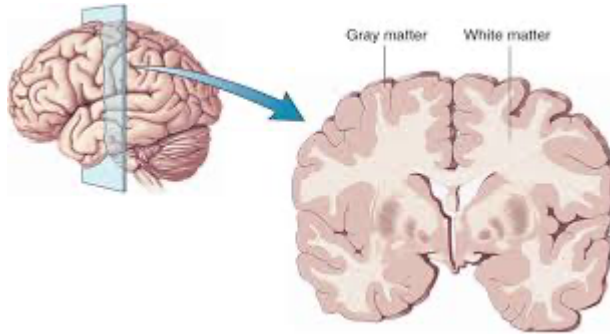
- ▶ Membrane cannot produce another AP because Na^+ channels are inactivated

▶ Relative refractory period occurs when VG K^+ channels are open, making it harder to depolarize to threshold

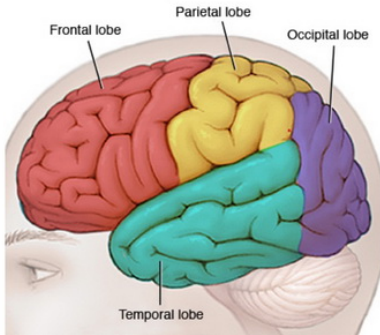


34. Acetylcholine is required to transmit nerve impulses across synapses. It is an excitatory neurotransmitter. If it is not released from the axon terminal of the pre-synaptic neuron then it is less likely that the post-synaptic neuron will reach threshold and an action potential will not be propagated.

35 white matter is myelinated and can regenerate due to the presence of neurilemma, grey matter are unmyelinated neurons and cannot regenerate



36 temporal, frontal, occipital, parietal



37 to protect the brain from large particles and foreign materials from entering because the brain cannot swell as a protective mechanism due to being surrounded by the skull

38. Sympathetic = flight or flight responses, Parasympathetic = rest & relaxation responses.

45. Afferent (sensory), interneuron, efferent (motor)

46. Afferent neurons are sensory neurons that carry information from a receptor in the PNS to the CNS. Efferent neurons are motor neurons that carry information from the CNS to the PNS & activate an effector.

47. Membrane potential is caused the difference of concentration of ions inside & outside the neuron. This is established by Na^+/K^+ pumps. There is greater build up of Na^+ ions outside the neuron than K^+ inside so the inside is said to be more negatively charged relative to the outside of the cell.

- 48 a) chemical, neurotransmitters are shown
b) C
c) A
d) neurotransmitters are being released, exocytosis
e) sodium channels open and excitation occurs

49. CNS = brain & spinal cord, PNS = nerves that connect the brain & spinal cord to the rest of the body = efferent & afferent neurons

50. Cerebrum has 2 hemispheres connected by the corpus callosum. Each hemisphere controls the opposite side of the body. Each hemisphere is further divided into 4 lobes (frontal, temporal, parietal, occipital) separated by key sulcus & fissures.

53. a) patella reflex
b) receptor → afferent/sensory neuron → interneuron → efferent/motor neuron → effector

54. Myelination. Action potential can then undergo saltatory conduction "hopping" from one node of Ranvier to the next which speeds up transmission rather than having to open Na⁺ & K⁺ channels at every point along the axon.

55 less likely to reach threshold because less Na⁺ moving into the axon, therefore fewer/no action potentials sent

57 a) A- Na⁺ channels opening, E – K⁺ channels closing
b) A