Nervous System Review

1. Explain a reflex arc.
2. Know the structure, function and location of a sensory neuron, interneuron, and motor neuron
3. What is (a)
   - Neuron
   - Nerve impulse
   - Receptor
   - Stimuli
   - Effector
   - Cell body
   - Dendrite
   - Axon
   - Axoplasm
   - Axomembrane
   - Schwann cell
   - Myelin
   - Ganglia

4. What is the sodium potassium pump?
5. What is diffusion? Exocytosis?
6. Know the parts of a nerve impulse – action potential – know the graph
7. What is saltatory conduction?
8. What is the function of myelin?
9. What is polarity?
10. Explain the process of synaptic transmission. Know the diagrams
11. What ion is important for synaptic transmission to occur?
12. What enzyme breaks down acetylcholine? Norepinephrine?
13. If a neurotransmitter is not broken down by an enzyme, what happens to it?
14. What is integration?
15. What are the two main divisions of the nervous system?
16. What are the two parts of the central nervous system?
17. Explain the difference between the voluntary and involuntary nervous system?
18. Explain the difference between the somatic and autonomic nervous system?
19. Explain the difference between the sympathetic and parasympathetic system?
20. How is the central nervous system protected and cushioned?
21. What is the difference between gray and white matter?
22. Know the diagram of the brain – parts and function
23. What is an endocrine gland?
24. Explain the neuroendocrine control centre.
25. Explain the 2 ways that the hormones involved in homeostasis are controlled.
26. What 2 hormones are stored and released by the posterior pituitary gland? Where are they made?
27. What hormones are released from the anterior pituitary? How are they regulated?
28. Why do nerve impulses not move backwards?
29. How do drugs work? What effect do they have on the body?
30. Which is not a correct association of structure and function?
   A. Axons– outgoing signals
   C. Cell body – nucleus and organelles
   D. Dendrites – incoming signals
   E. Interneuron – sums up in put before sending signals to muscle or gland
31. 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
32. Damage to one nerve results in lack of control to the wrist and also numbness. This indicates that:
   A. The nerve contained sensory neurons
   B. The nerve contained motor neurons
   C. The nerve contained both sensory and motor neurons
   D. The damage was to a central body in a ganglion
   E. The damage was to the spinal cord interneuron

33. In the axon, the nerve impulses travel
   A. Toward the cell body
   B. Away from the cell body
   C. In both directions
   D. Away from the synapse

34. In a dissection, most nerve fibers appear gray and white because
   A. The neuron is gray or white coloured
   B. Sodium ions are part of the salt compound and they flow along the surface
   C. They rapidly die and dead tissues soon become gray or white
   D. It is mostly myelin sheath made of lipid or fat

35. Which of the following structures does NOT pertain to neurons?
   A. Hypothalamus
   B. Schwann cells
   C. Myelin
   D. Nodes of Ranvier
   E. Effector

36. The sodium-potassium pump is primarily responsible for the
   A. Resting potential
   B. Action potential
   C. Excretion of salts
   D. Contraction of muscle fibres
   E. Maintaining isotonic water balance

37. A nerve impulse is
   A. Movement of a sodium ion all the way from dendrite to axon tip
   B. Movement of a potassium ion all the way from dendrite to axon tip
   C. Movement of an electron all the way from dendrite to axon tip
   D. 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

38. The difference between a weak stimulus and an intense stimulus is
   A. The action potential is graduated and a weak stimulus causes a small change in polarity
   B. Weak stimuli only open sodium gates, strong stimuli also open potassium gates
   D. A strong stimulus does not allow repolarization but sends a constant flow of ions
   E. All of the above are correct
39. In the diagram above of a nerve impulse, number 1 indicates the movement of
   A. Na$^+$ to the inside
   B. Na$^+$ to the outside
   C. K$^+$ to the inside
   D. K$^+$ to the outside

40. In the diagram above, number 2 indicates the movement of
   A. Na$^+$ to the inside
   B. Na$^+$ to the outside
   C. K$^+$ to the inside
   D. K$^+$ to the outside

41. In the diagram above, number 3 represents
   A. Depolarization
   B. Repolarization
   C. Action potential
   D. Threshold
   E. Resting potential

42. In the diagram above, number 5 represents
   A. Depolarization
   B. Repolarization
   C. Action potential
   D. Threshold
   E. Resting potential

43. 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

44. 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

45. 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

46. 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. Confused integration

47. The enzyme that breaks down acetylcholine within the synaptic cleft is
   A. Acetylcholinesterase
   B. Monoamine oxidase
   C. Lipase
   D. Maltase

48. Transmission of a nerve impulse from one neuron to another neuron is NOT dependent on
   A. The presence of calcium ions
   B. A synaptic cleft
   C. A presynaptic and postsynaptic membrane
   D. A depolarization and repolarization wave
49. The primary functions of the spinal cord involve
   A. Intelligence and memory
   B. Speech, taste, smell, vision, and hearing
   D. Controlling muscle activity and maintaining balance
   E. Local control and decision-making for local anatomy

50. A nerve is
   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

51. 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

52. 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

53. Administration of norepinephrine would
   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

54. 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
   E. The system coordinates organ responses

55. Which of these phrases is mismatched?
   A. Synaptic vesicles – neurotransmitters
   B. Ganglia – cell bodies outside the CNS
   C. Autonomic nervous system – mixed nerves
   E. Membrane potential – Na⁺ and K⁺

56. 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
   D. Parasympathetic nervous system with acetylcholine and emergencies
   E. Sympathetic nervous system with feelings of compassion and sympathy

57. The membranes that protect the brain and spinal cord are called
   A. Cerebrospinal membranes
   C. Ventricles
   D. Epithelium
   E. Gray matter
58. In the diagram above, the structure at “a” is a(n);
   A. Interneuron  
   B. Sensory neuron  
   C. Receptor  
   D. Motor neuron  

59. In the diagram above, the structure at “b” is a(n);
   A. Interneuron  
   B. Sensory neuron  
   C. Receptor  
   E. Effector

60. In the above diagram, the structure at “c” is a(n);
   A. Interneuron  
   B. Sensory neuron  
   C. Receptor  
   D. Motor neuron  
   E. Effector

61. In the above diagram, the structure at “d” is a(n);
   A. Interneuron  
   B. Sensory neuron  
   C. Receptor  
   D. Motor neuron  
   E. Effector

62. Which part of the brain contains centers for the heartbeat and respiration?
   A. Medulla oblongata  
   B. Hypothalamus  
   C. Cerebellum  
   D. Cerebrum  
   E. Pons

63. An impulse travelling up the spinal cord first enters the brain at the
   A. Thalamus  
   B. Hypothalamus  
   C. Hypothalamus  
   D. Cerebellum  
   E. Cerebrum

64. Which one is not DIRECTLY needed for nerve conduction?
   A. Dendrites  
   B. Axons  
   C. Cell membrane  
   D. Motor neuron  
   E. Ions

65. Which one does NOT move during nerve conduction?
   A. Sodium  
   B. Potassium  
   C. Positive charges
66. 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

67. 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

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

<table>
<thead>
<tr>
<th>AREA OF THE BRAIN</th>
<th>FUNCTION</th>
</tr>
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<tbody>
<tr>
<td>Cerebrum</td>
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<tr>
<td>Thalamus</td>
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<tr>
<td>Hypothalamus</td>
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<tr>
<td>Cerebellum</td>
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<tr>
<td>Medulla oblongata</td>
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<td>Corpus callosum</td>
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<td>Meninges</td>
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<td>Anterior pituitary gland</td>
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<tr>
<td>Posterior pituitary gland</td>
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69. Label the following diagrams