**Chapter 3**

Multiple Choice

1. Cajal famously discovered the cells in the brain are discrete, rather than connected like blood vessels, leading to his development of the:

\*A) Neuron Doctrine

B) neural code

C) neural network

D) Golgi stain

(Reference Page 77)

2. The dendrite of a neuron is responsible for \_\_\_\_\_\_ chemical signals.

\*A) collecting

B) conducting

C) integrating  
D) outputting

(Reference Page 78)

3. After the chemical signal is collected, but before it can be conducted down the axon, the signals must be:

A) filtered

B) conducting

\*C) integrated

D) output

(Reference Page 78)

4. Destruction of \_\_\_\_ neurons would eliminate the brain’s ability to control muscles.

A) glial

\*B) motor

C) sensory

D) afferent

(Reference Page 79)

5. If most neurons in the human brain are interneurons, then the output of most action potentials will be:

A) muscle movement

B) memory retrieval

C) transduction of external stimuli

\*D) input to other neurons

(Reference Page 79)

6. Multipolar neurons are distinguished by have many:

\*A) dendrites

B) axons

C) cell bodies

D) nodes of Ranvier

(Reference Page 80)

7. Unlike glial cells which come in only 4 basic types, there at least \_\_\_\_\_ types of neurons.

A) hundreds

\*B) dozens

C) thousands

D) millions

(Reference Page 80)

8. Visualizing individual neurons can be accomplished by using staining techniques, such as Nissl and \_\_\_\_\_ staining.

A) Cajal

\*B) Golgi

C) immunocytochemical

D) autoradiographic

(Reference Page 81)

9. Compared to a computer, neurons process information:

\*A) much slower

B) at around the same speed

C) much faster

D) in a more linear fashion

(Reference Page 82)

10. In neuron to neuron communication, neurotransmitters are released by \_\_\_\_\_ onto \_\_\_\_\_.

A) cell bodies; axon hillocks

\*B) Presynaptic cells; postsynaptic targets

C) axon terminals; glial cells

D) dendrites; axons

(Reference Page 83)

11. Which neurotransmitter is most responsible for muscle movements?

A) Glutamate

B) GABA

C) Norepinephrine

\*D) Acetylcholine

(Reference Page 83)

12. Which neurotransmitter is most responsible for muscle movements?

A) Glutamate

B) GABA

C) Norepinephrine

\*D) Acetylcholine

(Reference Page 84)

13. Some neurotransmitters are actually gases. These include nitric oxide and:

A) helium

B) hydrogen

\*C) carbon monoxide

D) carbon dioxide

(Reference Page 85)

14. The charge of a neuron is on the order of:

\*A) millivolts

B) microvolts

C) volts

D) megavolts

(Reference Page 86)

15. When a psychoactive drug prevents neurotransmitters from binding to the postsynaptic neuron, it should be classified as a \_\_\_\_\_ drug.

A) Inhibitory

B) Excititory

\*C) Antagonist

D) Agonist

(Reference Page 87)

16. Spatially separate inputs to a neuron can be integrated so long as they have similar

A) timing

B) strength

\*C) spatial orientation

D) origin

(Reference Page 88)

17. In general, the neuronal cell body combines inputs using:

A) averaging

\*B) addition

C) division

D) multiplcation

(Reference Page 88)

18. The presence of myelin sheath around an axon causes the action potential to:

A) move more smoothly down the axon

B) produce more neurotransmitters

\*C) travel faster

D) require more energy

(Reference Page 90)

19. An electrical gradient exists when the inside of a neuron is \_\_\_\_\_ than the outside of the cell.

A) more chemically dense

B) more chemically sparse

C) thicker

\*D) differently charged

(Reference Page 90)

20. Multiple Sclerosis affects the ability of the \_\_\_\_\_ to function properly.

A) cell bodies

B) myelin sheath

C) dendrites

\*D) ion channels

(Reference Page 91)

21. Chemical solutions such as \_\_\_\_\_ can inhibit action potentials so that we do not feel pain in the treated area.

A) acetylcholine

B) dopamine

\*C) lidocaine

D) GABA

(Reference Page 91)

22. To determine if a neuron is selective for a particular face, we can compare its firing rate when the stimulus is shown to:

\*A) its firing rate when shown other faces

B) it firing rate for pictures of houses

C) the firing rate of nearby neurons

D) its baseline firing rate

(Reference Page 92)

23. Neurons that have a preferred auditory frequency orientation exhibit a firing rate pattern that:

A) shows activity at only the preferred frequency

B) increases to a peak around the preferred frequency

\*C) shows no trial-to-trial variability

D) shows no baseline activity when there is no external stimulus present

(Reference Page 93)

24. Because neurons receive inputs from thousands of other neurons, the most important input feature is:

\*A) the total amount of input

B) where the input comes from

C) the function of the input

D) the final destination of the input

(Reference Page 95)

25. Encoding information across a population of neurons can overcome all the following problems except:

A) loss of cells

B) variability in single neurons

C) encoding a large number of patterns

\*D) coordinating activity across neurons

(Reference Page 95)

26. One way to coordinate population activity is for cells to fire:

A) in a sequence

\*B) synchronously

C) in small groups

D) at differ rates

(Reference Page 95)

**Answer Key**

1. A

2. A

3. C

4. B

5. D

6. A

7. B

8. B

9. A

10. B

11. D

12. D

13. C

14. A

15. C

16. C

17. B

18. C

19. D

20. D

21. C

22. A

23. C

24. A

25. D

26. B

27.

28.

29.

30.