THE NERVOUS SYSTEM NOTES

___1. The brain and the spinal cord are the
   a. peripheral nervous system       c. central nervous system
   b. sympathetic nervous system      d. parasympathetic nervous system

___2. What is the basic functional unit of the nervous system?
   a. cell body        b. reflex arc       c. neuron        d. neuron

___3. Which of the following is true?
   a. Dendrites carry information toward the cell body.
   b. Dendrites carry information away from the cell body.
   c. Axons carry information toward the cell body.
   d. None of the above

___4. Neurons carry information through the body in the form of
   a. nerve impulses.     b. dendrites.      c. axons.       d. nerve fibers.

___5. Which neurons conduct information toward the central nervous system?
   a. sensory neurons      b. motor neurons    c. interneurons    d. none of the above

___6. Neurons with myelin sheath conduct nerve impulses
   a. faster than neurons without myelin sheaths.
   b. at the same speed as neurons without myelin sheaths.
   c. slower than neurons without myelin sheaths.
   d. in greater numbers than neurons without myelin sheaths.
7. Messages take the form of electrical signals, and are known as
   a. sensory neurons       b. nerve impulses       c. motor neurons       d. reflex arc

8. The depolarization and repolarization of a neuron membrane is called
   a. action potential       b. resting potential       c. excitability       d. propagation

9. What are the spaces between adjacent neurons called?
   a. reflex arc         b. effector       c. synaptic cleft       d. resting potential

10. What is the function of neurotransmitters?
    a. hurl neurons through synapses to create new nerve impulses
    b. chemically link neurons across the synapse to conduct impulses
    c. receive and transmit ultrasound waves across synapses
    d. none of the above

11. For a neuron to return to its resting potential, it must
    a. lose negative charge   b. lose positive charge   c. gain negative charge   d. gain more sodium ions

12. A change in the environment that may be of sufficient strength to initiate an impulse is called a(an)
    a. excitability       b. stimulus       c. polarized       d. potential

13. When a neuron is depolarized, the inside of the membrane temporarily becomes
    a. more negative than the outside         b. neutral compared to the outside.
    c. more positive than the outside       d. None of the above

14. The minimum level of a stimulus that is required to activate a neuron is called the
    a. action potential       b. threshold       c. resting potential       d. enzymes

15. The long fiber that carries impulses away from the nerve cell body is a (n)
    a. dendrite       b. interneuron       c. axon       d. axon terminal

16. The action that restores a neuron to its resting potential is
    a. polarization       b. action potential       c. depolarization       d. refractory period

17. When a nerve cell is polarized, the inside of the cell membrane is
    a. positively charged and the outside is positively charged.
    b. positively charged and the outside is negative charged.
    c. negatively charged and the outside is negatively charged.
    d. negatively charged and the outside is positively charged.
18. Which description does not apply to all nerve impulses?
   a. They follow an all-or-none principle.  
   b. They flow at various speeds.  
   c. They jump from node to node.  
   d. They flow in only one direction.

19. If you accidentally touch a hot stove, you pull your finger away before the impulse is relayed to the
   a. spinal cord  
   b. effector  
   c. brain  
   d. receptor

20. The somatic nervous system regulates activities that are
   a. unconscious control  
   b. involuntary  
   c. conscious control  
   d. automatic

21. For a neuron to achieve Resting Potential, it must move ______________________________ ions out of the cell, and actively pump ______________________________ ions into the cell.

22. At the beginning of an impulse, the ______________________________ gates open.

23. Action Potential is another name for a (an) ______________________________.

24. A(n) ______________________________ is an automatic response to a stimulus.

25. Subdivision of the PNS that regulates the activity of the heart and smooth muscle and of glands; also called the involuntary nervous system.
   ______________________________ nervous system.

26. Nerves that carry messages from the body to the central nervous system make up the ______________________________ nervous system.

27. What are the two major division of the peripheral nervous system?
   ______________________________ & ______________________________

28. Nervous system subdivision that is composed of the brain and spinal cord.
   ______________________________ nervous system.

29. Messages take the form of electrical signals, and are known as ______________________________.

30. The ______________________________ is the basic functional unit of the nervous system.

31. ______________________________ neurons carry impulses from the spinal cord to the effectors.
32. Within the spinal cord, motor and sensory neurons are connected by
________________________________________________

33. A major subdivision of the nervous system that serves as the communication lines,
linking all parts of the body to the CNS.__________________________________________nervous system.

34. The___________________________________________ nervous system does not come
in contact with the environment.

35. The autonomic nervous system is divided into TWO divisions, they are
___________________________________________ & ______________________________________

36. The above two divisions have a(n) __________________________ effects on the organs they control.

37. A(n)_____________________________________________ is a chemical substance
that is used by one neuron to signal another.

38. The point of contact at which impulses are passed from one cell to another are known
as a(n) ____________________________

39. What two ions are moved across a neuron’s membrane giving it electric potential?
___________________________________________ & ______________________________________

40. The Human Nervous System is divided into TWO Major Divisions, list them:
___________________________________________ & ______________________________________

41. ___________________________ neurons carry impulses from receptors to the spinal
cord.

42. The depolarization and repolarization of a neuron’s membrane is called a (n)
___________________________________________

43. What are the spaces between adjacent neurons called?
___________________________________________

44. A change in the environment that may be of sufficient strength to initiate an impulse
is called a(an)
___________________________________________.
45. The minimum level of a stimulus that is required to activate a neuron is called the __________.

46. The long fiber that carries impulses away from the nerve cell body is a (n) __________.

47. The action that restores a neuron to its resting potential is called __________.

48. Which type of neurons conduct information toward the central nervous system? __________.

49. The somatic nervous system regulates activities that are under __________.

50. The brain and the spinal cord make up the __________.

51. What is the basic functional unit of the nervous system? __________.

52. Subdivision of the PNS that controls voluntary activities such as the activation of skeletal muscles. __________.

For questions 53-58, match the following answers to one of the statements below.

A. Resting Potential  B. Action Potential  C. Repolarization  D. Sodium-potassium pump  E. Depolarization  F. Refractory Period

____ 53. K+ moves out of the axon
____ 54. Charges inside the axon change positive.
____ 55. Active transport system.
____ 56. Axon is not conducting an impulse.
____ 57. Time when the axon cannot conduct an impulse.
____ 58. Axon is depolarized, then repolarized.
1. What is the relationship between afferent neurons, interneurons, and efferent neurons?

2. What role does the sodium-potassium pump play in the restoration of the membrane potential?

3. Explain the difference between an afferent neuron and an efferent neuron.

4. Describe how the patellar (knee-jerk) reflex operates.

5. What are the functions of the Nervous System that enables the body to respond quickly?

6. Explain how the relative concentrations of sodium ions and potassium ions inside and outside a neuron change during an action potential.

7. Describe the process of the nerve impulse from the point at which the nerve has been stimulated.

8. Most organs in the body are stimulated by both the sympathetic division and the parasympathetic division of the autonomic nervous system. Explain how this helps maintain homeostasis and what each division does.

9. A neuron consists of three main parts, List Them and their Main Function:

10. How does the autonomic nervous system work to maintain homeostasis?

11. Describe the role of neurotransmitters in transmitting a signal across a synaptic cleft.

12. Explain how a signal in the nervous system is transmitted between adjacent neurons?

13. Contrast resting potential with action potential.

14. Explain the importance of the refractory period and what occurs during the refractory period.

15. Describe the anatomy of a neuron.
1. What is the basic functional unit of the nervous system? _____________________.

2. The nervous system ________________ and ________________ all essential
functions of the human body.

3. The nervous system ________________ and ________________ information
about activities within the body and monitors and responds to ________________ and
_______________ changes.

4. What are the Four Functions of the nervous system?
   A. ___________________________________________________________________
   B. ___________________________________________________________________
   C. ___________________________________________________________________
   D. ___________________________________________________________________

5. The cells that carry messages throughout the nervous system are called
____________________________.

6. Messages take the form of electrical signals, and are known as ________________.

7. Neurons can be classified into THREE Types and Describe each type.
   A. __________________________________________
   B. __________________________________________
   C. __________________________________________

8. What are the THREE main parts of a Neuron and their function?
   A. __________________________________________
9. The difference in charge across a nerve cells membrane resulting from the negative charge on the inside and the positive charge on the outside is known as ____________________________.

10. As a result of resting potential, the neuron is said to be ________________________.

11. A _____________________ is a change in the environment that may be of sufficient strength to initiate an impulse.

12. The ability of a neuron to respond to a stimulus and convert it into a nerve impulse is known as ________________________________.

13. What two ions move across a neuron giving it electric potential?
   ______________________ and _______________________

14. The depolarization and repolarization of a membrane produces a(n)
   ______________________ and ________________________.

15. ________________________ returns the neuron back to its resting potential.

16. ______________________ is another name for a Nerve Impulse.

17. __________________ improves the rate of impulses along an ________________.

18. The minimum level of a stimulus that is required to activate a neuron is called the ____________________________.

19. A _________________________ is a chemical substance that is used by one neuron to signal another.

20. The point of contact at which impulses are passed from one cell to another are known as a ______________________ ________________________.
21. The Human Nervous System is divided into TWO major divisions, list them:
   A. ________________________________________________
   B. ________________________________________________

22. _________________________ neurons carry impulses from receptors to the spinal cord.

23. ____________________________ neurons carry impulses from the spinal cord to the effectors.

24. Within the spinal cord, motor and sensory neurons are connected by ________________________.

25. All of the nervous system outside the brain and spinal cord is known as the ______________________ nervous system.

26. The _____________________________ nervous system does not come in contact with the environment.

27. The autonomic nervous system is divided into TWO parts, they are
   A. ________________________________________________
   B. ________________________________________________

28. The above two parts have _________________________________ effects on the organs they control.

29. For a neuron to achieve Resting Potential, it must move _________________ ions out of the cell, and actively pump ______________________ ions into the cell.

30. At the beginning of an impulse, the ______________________ gates open.

31. Action Potential is another name for a (an) ________________________________.

32. The brain and the spinal cord are the ________________________________.

33. Neurons carry information through the body in the form of ________________________________.

34. Which type of neuron conducts information toward the central nervous system?
   ________________________________

35. Neurons with myelin sheath conduct nerve impulses ________________________ than neurons without myelin sheath.
36. Messages take the form of electrical signals, and are known as ______________

37. What are the spaces between adjacent neurons called? ________________

38. The long fiber that carries impulses away from the nerve body is a(n) ________________.

39. The action that restores a neuron to its resting potential is ________________.

40. The autonomic nervous system regulates activities that are ________________, or ________________.

41. The ________________ ______________ acts as a communication link between the brain and the PNS.

42. A ________________ is the simplest response to a stimulus.

43. The ________________ Nervous System regulates activities that are under conscious control.

44. The sympathetic nervous system generally ________________ organs.

45. The parasympathetic nervous system generally ________________ organs.

46. The period after an impulse, in which a neuron is unable to conduct a nerve impulse is called ________________ ________________.

For questions 47-52, match the following answers to one of the statements below.

A. Depolarization
B. Sodium-potassium pump
C. Action Potential
D. Resting Potential
E. Refractory Period
F. Repolarization

_____ 47. Charges inside the axon change positive.
_____ 48. Active transport system.
_____ 49. Axon is not conducting an impulse.
_____ 50. Time when the axon cannot conduct an impulse.
_____ 51. Axon is depolarized, then repolarized.
_____ 52. K+ moves out of the axon
1. Describe the process of the nerve impulse from the point at which the nerve has been stimulated.

2. How is the signal in the nervous system transmitted between adjacent neurons?

3. Explain the difference between an afferent neuron and an efferent neuron.

4. Describe the structure of a neuron.

5. What functional advantage does a neuron with several dendrites have over a neuron with only one dendrite?

6. Identify the two main organs that make up the central nervous system.

7. Why does the nervous system consume a large amount of energy?

8. Most organs in the body are stimulated by both the sympathetic division and the parasympathetic division of the autonomic nervous system. Explain how this helps maintain homeostasis.

9. How do the somatic nervous system and the autonomic nervous system differ?

10. Describe how the patellar (knee-jerk) reflex operates.

11. What is a neurotransmitter? Describe two possible effects that neurotransmitters may have at a synapse.

12. Briefly explain how the relative concentrations of sodium ions and potassium ions inside and outside a neuron change during an action potential.

13. Distinguish between sensory receptors, motor neurons, and interneurons.

14. What role does the sodium-potassium pump play in the restoration of the membrane potential?

15. Contrast resting potential with action potential.

16. Explain the importance of the refractory period and what occurs during the refractory period.

17. Describe the role of neurotransmitters in transmitting a signal across a synaptic cleft.
1. The Brain is wrapped in three layers

Cerebellum
of connective tissue know as
Callosum

A. Cerebellum
B. Corpus
C. Gray Matter
2. Responsible for all voluntary activities of the body.  
D. Cerebral Cortex  
E. Hypothalamus  

3. Controls involuntary functions like breathing, blood pressure, and heart rate.  
F. Brain Stem  
G. Pons  
H. White Matter  
I. Cerebral Medulla  

4. The hemispheres of the cerebrum are connected in a region known as.  
J. Lobes  
K. Tract  
L. Thalamus  
M. Cerebrum  
N. Meninges  
O. Medulla  

5. Unmyelinated neurons.  

6. Each hemisphere of the cerebrum is divided into regions called.  
O. Medulla  
P. Midbrain  

7. Maintains life support systems or controls vital body processes.  

8. This area is involved in hearing and vision.  

9. Means "Bridge".  

10. The switching station for sensory input.  

11. Tells each half of the brain what the other is doing.  

12. Controls balance, posture and coordination.  


14. Outer surface of the cerebrum.  

15. Control center for hunger, thirst, fatigue, anger, and body temperature.  

16. The inner surface of the cerebrum.  

17. The _____ is part of the brain that controls balance, posture, and coordination.  
a) cerebrum  
b) cerebellum  
c) medulla oblongata  
d) hypothalamus
18. The hypothalamus
   a) lies below the medulla oblongata in the brain stem  
   b) lies below the thalamus  
   c) lies above the cerebellum  
   d) is important in maintaining balance  
   e) None of the above.

19. The cerebral cortex
   a) is located deep in the brain  
   b) is the lobed, highly folded structure at the back of the brain  
   c) is the folded outer covering of the brain  
   d) contains the reticular formation

20. The body's left side is controlled by the cerebrum's
    a) left side  
    b) right side  
    c) both left and right sides  
    d) front half

21. The gray matter of the brain consists of
    a) unmyelinated neurons  
    b) myelinated neurons  
    c) axons  
    d) only synapses

22. The cerebellum is important in
    a) coordinating motor responses and maintaining posture  
    b) controlling hormone levels and maintaining homeostasis  
    c) protecting the brain and spine  
    d) processing olfactory and taste information  
    e) None of the above.

23. The gray matter of the brain
    a) is called the cerebral medulla  
    b) is called the cerebral cortex  
    c) is called the cerebellum  
    d) is called the medulla oblongata

24. The thalamus and hypothalamus make up the
    a) lower brain stem  
    b) cerebrum  
    c) cerebellum  
    d) diencephalon

25. The part of the brain that controls conscious activities, memory, language, and the senses is the
    a) medulla oblongata  
    b) cerebrum  
    c) cerebellum  
    d) thalamus

26. This area of the brain plays an important role in emotion, memory, and motivation.
    a) brain stem  
    b) cerebrum  
    c) limbic system  
    d) cerebellum

27. Most sensory impulses pass through the _______ on their way to the cerebrum.
    a) cerebellum  
    b) pituitary  
    c) motor neurons  
    d) thalamus

28. The ______ is the area of the brain that controls activities related to homeostasis, such as body temperature, hunger, thirst, and sleep.
a) cerebrum   b) cerebellum   c) medulla oblongata   d) hypothalamus

29. The right and left cerebrum hemispheres are linked by a bundle of neurons called a ______________________________________________________________.

30. What are the three main parts of the human brain?

31. The brain stem connects the ____________________________________________ to the __________________________________________________________.

32. The cerebrum hemispheres are connected in a region known as the ____________________________._

33. _______________________________ means bridge.

34. The ___________________________________________________________ coordinates and balances the actions of muscles so that the body can move gracefully and efficiently.

35. The cerebrum is divided into two ____________________________________________.

36. What are the main parts (divisions) of the lower brain stem?

37. What are the names of the lobes of the cerebrum?

38. The ___________________________________________ is the control center of the brain.

39. The brain is wrapped in three layers of __________________________________________ tissue known as the _____________________________________________.
   The outer layer is called the _____________________________________________.
   The middle layer is called the _____________________________________________.
   The inner layer is called the _____________________________________________.
   ______________________________________________________________ separates the middle and inner layers.

40. The control center for hunger, thirst, fatigue, anger, and body temperature is the _____________________________________________.
41. The ______________________________ controls involuntary functions that include breathing, blood pressure, heart rate, digestion, swallowing, and coughing.

1. MIDBRAIN
2. CORPUS CALLOSUM
3. SPINAL CORD
4. THALAMUS
5. PITUITARY GLAND
6. CEREBRAL CORTEX
7. HYPOTHALAMUS
8. PONS
9. CEREBELLUM
10. CEREBRAL MEDULLA
11. MEDULLA OBLONGATTA
12. BRAIN STEM

1. The portion of the brain that receives most sensory information is the
   a. hypothalamus   b. thalamus   c. cerebrum   d. cerebellum
2. High-pitched sounds cause hairs in the base of the ________ to vibrate.
a. semicircular canal  b. stapes  c. incus  d. cochlea

3. Chemicals acting on hairlike nerve endings in the upper portion of the nose initiate impulses in the
a. hairs  b. axons  c. dendrites  d. synapse

4. The _______ of the eye is a solid structure that focuses light on the back of the eye.
a. pupil  b. lens  c. iris  d. cornea

5. Receptors that detect changes in temperature, touch, pressure, and pain are located in large numbers in the
a. bones  b. spinal cord  c. muscles  d. skin

6. The part of the brain that controls conscious activities, memory, language, and the senses is the
a. medulla oblongata  b. cerebrum  c. cerebellum  d. thalamus

7. Cells found in the retina called ________ are adapted for detecting color and for sharp vision.
a. rods  b. iris  c. photons  d. cones

8. The _______ is the area of the brain that controls activities related to homeostasis.
a. hypothalamus  b. cerebrum  c. thalamus  d. cerebellum

9. The movement of the hairs in the inner ear starts a depolarization of the _______ nerve.
a. optic  b. auditory  c. olfactory  d. facial

10. Sensory impulses pass through the __________ on their way to the cerebrum.
a. cerebellum  b. pituitary  c. motor neurons  d. thalamus

11. The layer of nerve tissue at the back of the eye made up of cells that respond to light energy is the
a. pupil  b. iris  c. cornea  d. retina

12. The ________ is the area of the brain that controls activities related to homeostasis, such as body temperature, hunger, thirst, and sleep.
a. cerebrum  b. cerebellum  c. medulla oblongata  d. hypothalamus

13. The _________ is a snail-shaped structure in the inner ear that is filled with fluid, lined with hair cells, and connected to the auditory nerve.
a. incus  b. cochlea  c. stapes  d. semicircular canals

14. The _________ is part of the brain that controls balance, posture, and coordination.
a. cerebrum  b. cerebellum  c. medulla oblongata  d. hypothalamus

15. When energy in the form of sound waves is converted into a nerve impulse in the inner ear, the response is known as
a. thermoreception  b. chemoreception  c. mechanoreception  d. photoreception

16. When chemicals acting on the hairlike ending located in your nose initiate impulses in the olfactory nerve, the response is called
a. thermoreception  b. chemoreception  c. mechanoreception  d. photoreception
17. Which part of the spinal cord contains cell bodies of neurons?
   a. gray matter  b. dorsal root  c. ventral root  d. white matter

18. The cerebellum is important in
   a. coordinating motor responses and maintaining posture
   b. controlling hormone levels and maintaining homeostasis
   c. protecting the brain and spine
   d. processing olfactory and taste information

19. The thalamus
   a. lies below the hypothalamus in the lower brain stem
   b. directs sensory information to the proper regions of the cerebral cortex
   c. controls homeostasis
   d. is important in maintaining balance

20. The cerebral cortex
   a. is located deep in the brain
   b. is the lobed, highly folded structure at the back of the brain
   c. is the folded outer covering of the brain
   d. contains the reticular formation

21. Photoreceptors are stimulated by
   a. heat  b. pressure  c. chemicals  d. light

22. Mechanoreceptors are stimulated by
   a. heat  b. pressure  c. chemicals  d. light

23. The body's left side is controlled by the cerebrum's
   a. left side  b. right side  c. both left and right sides  d. front half

24. Loud noises can damage hairlike cells in the
   a. eardrum  b. ear canal  c. cochlea  d. stirrup

25. Which of the following is NOT one of the four tastes we detect on our tongues?
   a. sweet  b. hot  c. salty  d. bitter

26. All messages received by the eyes are interpreted by the
   a. optic nerve  b. retina  c. brain  d. lens

27. The message of smell is carried to the brain by the
   a. nasal chamber  b. auditory nerve  c. olfactory nerve  d. nostrils

28. The gray matter of the brain consists of
   a. cell bodies of neurons  b. only synapses  c. myelin  d. nodes

29. Sensory receptors
   a. link interneurons with motor neurons
   b. are found only in the spine
   c. are found only in the brain
   d. respond to stimuli

30. Which part of the spinal cord contains motor neurons?
   a. gray matter  b. dorsal root  c. ventral root  d. All of the above.

1. Nerves that control breathing, swallowing, heartbeat, and the diameter of the blood
vessels
are found in the __________________________   ______________________________.

2. The cells (receptors) that are stimulated by chemicals are called
__________________________________.

3. The brain is wrapped in three layers of __________________________ tissue known as the
________________________________. The outer layer is called the
________________________________, the middle layer is called the
________________________________, and the inner layer is called the
________________________________.

_________________________________  _____________________ separates the middle and inner layers.

4. The brainstem connects the ____________________________ to the
_________________________   ____________________________.

5. The __________________________________ is the control center of the brain.

6. The __________________________________ and the two tiny sacs behind them help us to sense balance or equilibrium.

7. The thalamus, hypothalamus, and cells deep within the gray matter of the brain make up
the __________________________ system which helps regulate emotions.

8. The sense organ that detects taste are the ____________________________.

9. What are the THREE main parts of the brain?
   a. __________________________________
   b. __________________________________
   c. __________________________________

10. The Cerebrum is divided into TWO ____________________________.

11. The sense of smell is a ____________________________ sense.

12. The largest sense organ is your ____________________________.

13. The cerebrum hemispheres are connected in a region known as the
    __________________________   ________________________________.

14. The right and left cerebrum hemispheres are linked by a bundle of neurons called a
    ____________________________.
15. What are the names of the FOUR lobes of each cerebrum hemisphere?
____________________________,
_____________________________, _____________________________,
____________________________

16. The __________________ coordinates and balances the actions of muscles so that the body can move gracefully and efficiently.

17. What are the THREE main parts of the LOWER Brainstem?
   a. __________________________________________
   b. __________________________________________
   c. __________________________________________

18. What are the FOUR main kinds of tastes that humans can detect?
_________________, ______________________, ______________________,
____________________

19. ________________ means bridge.

20. The control center for hunger, thirst, fatigue, anger, and body temperature is the _______________________.

21. The __________________________ controls involuntary functions that include breathing, blood pressure, heart rate, digestion, swallowing, and coughing.

22. The ________________ is the portion of the eye that gives your eye its color.

23. The outer surface of the cerebrum is called the ________________
    __________________ and consists of ______________________________ neurons.

24. Impulses leave the eye by way of the ________________ ________________.

25. Nerve impulses from the ear are carried to the brain by the ________________ ________________.

26. The most touch sensitive areas are the ________________, ________________, and ________________.

27. The largest and most prominent part of the brain is the ________________________.

28. The inner surface of the cerebrum is called the ________________ ________________, which is made up of bundles of ______________________________ axons.
29. What is the upper brainstem called? And what two parts of the brain are found there?

30. The is the area of the brain that controls activities related to homeostasis, such as body temperature, hunger, thirst, and sleep.

31. is part of the brain that controls balance, posture, and coordination.

32. The is a snail-shaped structure in the inner ear that is filled with fluid, lined with hair cells, and connected to the auditory nerve.

33. When chemicals acting on the hair-like ending located in your nose initiate impulses in the olfactory nerve, the response is called.

34. Photoreceptors are stimulated by.

35. The body's left side is controlled by the cerebrum's.

36. All messages received by the eyes are carried to the brain by the.

37. The message of smell is carried to the brain by the.

38. Mechanoreceptors are stimulated by.

39. The is the area of the brain that controls activities related to homeostasis.

40. The movement of the hairs in the inner ear starts a depolarization of the nerve.

41. Most sensory impulses pass through the on their way to the cerebrum.
42. The layer of nerve tissue at the back of the eye made up of cells that respond to light energy is called the _________________________________.

43. The ______________________________ of the eye is a solid structure that focuses light on the back of the eye.

44. The portion of the brain that receives most sensory information is the _________________________________.

45. Cells found in the retina called ________________________________ are adapted for detecting color and for sharp vision.

46. Receptors that detect changes in temperature, touch, pressure, and pain are located in large numbers in the _________________________________.

47. The part of the brain that controls conscious activities, memory, language, and the senses is the _________________________________.

48. The ________________________________ and the two tiny sacs behind them help us to sense balance or equilibrium.

49. Tiny pieces of calcium carbonate in the ear called ________________________________ help the body maintain its balance.

50. The ________________________________ is the light-sensing portion of the eye.

51. When light enters the eye, it first passes through the _________________________________.

52. The specialized hearing receptors found in the cochlea are ________________________________ cells.

53. The ________________________________ is a small, snail-shaped structure in the ear lined with hair cells.

54. The ________________________________ is the light-sensing portion of the eye.

55. When chemicals acting on the hair-like endings located in your nose initiate impulses in the olfactory nerve, the response is called _________________________________.

56. Mechanoreceptors are stimulated by _________________________________.

____.
57. Tiny pieces of calcium carbonate in the ear called __________________________ help the body maintain its balance.

58. Impulses from the eye go to what part of the cerebrum?
_________________________________________________________
_________________________________________________________

59. Ventral-root axons carry information to ____________________________, while dorsal-root axons carry information to _____________________________.

60. The division of the nervous system that controls stimulation of internal organs during routine conditions is called the __________________________ nervous system.

61. Sensory receptors that respond to tissue damage are called __________________________ receptors.

1. Why is the ear really TWO sense organs in one?

2. What are Two functions of cerebrospinal fluid?

3. What are the Five kinds of sensory receptors and the type of stimuli they respond to?

4. How is the brain protected from injury? (Be specific)

5. How do the functions of the cerebral hemispheres, cerebellum, and brain stem differ?

6. Why is important to have the pons bridge the Cerebrum and Cerebellum?

7. How is taste detected? What type of sensory receptor is involved with the perception of taste?

8. Explain how sound vibrations are transmitted through the ear?

_____ 1. The central nervous system consists of
a. the brain and spinal cord. c. the brain stem and cerebellum.
b. the spinal nerves only. d. the cerebrum and spinal cord.

_____ 2. Gray matter includes
a. cell bodies of neurons. c. myelin.
b. synapses. d. nodes.
3. Refer to the illustration above. Structure 2 in the diagram is the
- a. reticular formation
- b. brain stem
- c. cerebellum
- d. cerebrum

4. Limbic system: processing information about emotions and memory ::
- a. cerebellum: maintaining balance and posture
- b. brain stem: providing nerve connections for consciousness
- c. hypothalamus: connecting the brain to the spinal cord
- d. reticular formation: regulating body temperature and blood pressure

5. Which part of the spinal cord contains dendrites, unmyelinated axons, and the
cell bodies of neurons?
- a. gray matter
- b. dorsal root
- c. ventral root
- d. white matter

6. Which part of the spinal cord contains motor neurons?
- a. gray matter
- b. dorsal root
- c. ventral root
- d. All of the above

7. Information is carried from the central nervous system to a muscle or gland by
- a. sensory neurons
- b. afferent neurons
- c. reticular neurons
- d. motor neurons

8. Sensory neurons transmit messages
- a. from the central nervous system to a muscle or gland
- b. from the brain to the spinal cord
- c. from the environment to the spinal cord or brain
- d. within the brain
9. Motor neurons transmit messages
   a. from the environment to the brain.
   b. from the environment to the spinal cord.
   c. from the spinal cord to the brain.
   d. from the central nervous system to a muscle or gland.

10. The peripheral nervous system
   a. is not linked to the central nervous system.
   b. provides pathways to and from the central nervous system.
   c. consists of the cerebellum and spinal cord.
   d. is composed only of motor neurons.

11. The autonomic nervous system controls
   a. reflexes.
   b. voluntary movement.
   c. involuntary functions of the internal organs.
   d. locomotion.

12. The body’s response to a physical threat involves activity of the
   a. autonomic nervous system.
   b. peripheral nervous system.
   c. sympathetic nervous system.
   d. All of the above

13. A reflex
   a. may involve two or three neurons.
   b. is not learned.
   c. is not under conscious control.
   d. All of the above

14. Extensions at one end of a neuron’s body that receive input are called
   a. axons.
   b. synapses.
   c. cell bodies.
   d. dendrites.

15. Nodes of Ranvier
   a. strengthen axons.
   b. slow the nerve impulse.
   c. occur in dendrites.
   d. are gaps in the myelin sheath.

16. The myelin sheath
   a. transmits impulses from one neuron to another.
   b. insulates the synapses.
   c. nourishes the neurons.
   d. insulates the axons.

17. The sodium-potassium pump
   a. rebuilds axon fibers.
   b. restores resting potential.
   c. creates a stimulus.
   d. is found only in the peripheral nervous system.
18. Which statement about the resting potential of a neuron is true?
   a. There are many times more sodium ions outside the neuron’s membrane than inside.
   b. Sodium ions are in balance inside and outside the neuron’s membrane.
   c. There are fewer potassium ions inside the neuron’s membrane than outside.
   d. Potassium and sodium ions are equal on both sides of the neuron’s membrane.

19. Refer to the illustration above. When a neuron is at rest,
   a. sodium ions are found mostly on the outside of the cell.
   b. potassium ions are found mostly on the inside of the cell.
   c. the inside of the cell is negatively charged.
   d. All of the above

20. Refer to the illustration above. The diagrams show a nerve impulse
   a. moving from the inside to the outside of an axon.
   b. moving from the outside to the inside of an axon.
   c. moving an action potential along a neuron.
   d. moving slowly.

21. Refer to the illustration above. When an impulse moves down the axon,
   a. sodium ions first rush out of the cell.
   b. a small part of the axon momentarily reverses its polarity.
   c. the resting potential of the cell does not change.
   d. potassium ions are pumped into the axon.

22. Refer to the illustration above. An action potential may be best described as
   a. an electrical impulse.
   b. an electromagnetic message.
   c. a chemical message.
   d. a chemical change occurring in the brain.

23. Electrical changes in a neuron create
   a. a stimulus.
   b. an electrical shock.
   c. an action potential.
   d. light and sound.
24. Refer to the illustration above. In the diagram, the structure labeled “X” is a
   a. neurotransmitter molecule.
   b. neuromodulator molecule.
   c. receptor protein molecule.
   d. psychoactive drug molecule.

25. Refer to the illustration above. If neurotransmitters could not be cleared out of a
   synapse after transmitting a message,
   a. the second neuron would continue to be stimulated for an indefinite period of time.
   b. the first neuron could not pass on its impulse.
   c. neuromodulators would be formed in the synapse.
   d. the neurotransmitter would magnify the effect of a psychoactive drug.

26. Neurotransmitters are
   a. electrical impulses.
   b. found only in neurons with myelin sheaths.
   c. released at synapses.
   d. produced by muscles.

27. Some neurotransmitters cross a synaptic cleft and open sodium channels in the
   membrane of the postsynaptic neuron, causing
   a. inhibition of impulses in the neuron.
   b. the death of the neuron.
   c. initiation of an impulse in the neuron.
   d. the formation of protein receptors in the neuron.

28. When a nerve impulse reaches a synapse, neurotransmitters
   a. become enzymes in the space between the neurons.
   b. are released into the synaptic cleft.
   c. cover the membrane of the axon.
   d. cause the cell body of the next neuron to enlarge.
29. The layer of photoreceptors and other neurons at the back of the eye is called
   a. retina.       b. iris.       c. cochlea.       d. optic nerve.

30. The ____ respond(s) to dim light coming into the eye.
   a. cones           b. cornea         c. lens           d. rods

31. Colorblindness is caused by faulty or missing
   a. blood vessels.   b. cones.       c. rods.          d. glands.

32. iris : amount of light entering the eye ::
   a. rod : amount of light entering the eye
   b. cornea : shape of the lens
   c. lens : point of focus on the retina
   d. retina : movement of iris muscle

33. Sensory receptors essential for balance are located in the
   a. sclera.                       c. cochlea of the inner ear.
   b. eardrum.                          d. semicircular canals.

34. Hair cells in the semicircular canals detect
   a. motion of the head.         c. loudness.
   b. the direction of gravity.     d. the direction of sounds.

35. Ears
   a. function to detect sounds.
   b. maintain your balance and sense of where you are in space.
   c. detect only internal stimuli.
   d. Both a and b

36. Specialized hearing receptors are found in the
   a. cornea.                       c. cochlea.
   b. semicircular canals.           d. cerebellum.

37. When we hear a sound,
   a. sound waves enter the ear canal and strike the eardrum.
   b. the fluid in the cochlea moves.
   c. the auditory nerve carries nerve impulses to the brain.
   d. All of the above

38. When tobacco is inhaled, nicotine
   a. is absorbed into the bloodstream through the mouth and lungs.
   b. is transported throughout the body.
   c. increases blood pressure and heart rate.
   d. All of the above
39. Tars
   a. cause an increase in heart rate.    c. are neurotransmitters.
   b. paralyze cilia.                   d. All of the above

40. Smoking can cause
   a. lung cancer.                     c. stains on the teeth.
   b. cancer of the mouth and larynx.  d. All of the above

41. Drinking alcohol, smoking, or using other drugs during pregnancy can cause
   a. birth defects.                   c. mental retardation.
   b. low birth weight.                d. All of the above

42. Stimulants and depressants are named for their effects on
   a. the respiratory system.
   b. the digestive system.
   c. behavior.
   d. the central nervous system.

43. Which of the following is not an effect of a depressant drug?
   a. impaired coordination             c. increased heart rate
   b. slowed reaction time              d. decreased respiration rate

44. Fetal alcohol syndrome
   a. results when babies are allowed to drink alcohol.
   b. is a cluster of physical and mental defects associated with exposure of a fetus to alcohol.
   c. is likely to occur only when pregnant women become drunk.
   d. All of the above

45. Which of the following definitions is incorrect?
   a. An effective dose is a dose that causes a desired effect.
   b. A lethal dose is a dose that results in death.
   c. Withdrawal is a response to the lack of a drug.
   d. Tolerance means that decreasing amounts of a drug are needed to be effective.

46. When a drug blocks removal of neurotransmitters for a prolonged period,
   a. receptors across the synapse are flooded with excess neurotransmitters.
   b. the receiving nerve lowers the number of its receptors in the synapse.
   c. the only way to maintain normal functioning of the nerve pathway is to continue taking the drug.
   d. All of the above

47. When an addict stops taking cocaine, the addict’s body will not function normally until
   a. the number of receptors in the affected synapses has had time to readjust.
   b. the amount of cocaine has been reduced to a safe level.
c. narcotics are prescribed by a physician.
d. All of the above

____ 48. Cocaine
a. mimics neurotransmitters.
b. inhibits the reuptake of neurotransmitters.
c. degrades neurotransmitters.
d. All of the above

____ 49. Cocaine
a. affects the central nervous system by changing the activity of synapses.
b. inhibits the reuptake of neurotransmitters.
c. overstimulates nerve pathways.
d. All of the above

Complete each statement.

1. Nerves that control breathing, swallowing, heartbeat, and the diameter of blood vessels are found in the ________________.

2. The thalamus, the hypothalamus, and cells deep within the gray matter of the brain make up the ________________ system, which helps regulate emotions.

3. Ventral-root axons carry information to ________________ and glands, while dorsal-root axons carry information to the ________________ system.

4. The part of the nervous system that does not include the spinal cord and brain is called the ________________ nervous system.

5. The part of the peripheral nervous system that controls internal organs is called the ________________ nervous system.

6. A sudden, involuntary movement in response to a stimulus is called a(n) ________________.

7. A(n) ________________ is the basic unit of communication of the nervous system.

8. Cytoplasmic extensions called ________________ allow a neuron to receive information simultaneously from many different sources.

9. Some axons are surrounded by an insulating structure called a(n) ________________.
10. A neuron transmits a nerve impulse as a wave of ________________ charge.

11. The electrical charge across the membrane of a neuron is caused by different concentrations of sodium and ________________ ions inside and outside the cell.

12. Messages are carried across synapses by _________________.

13. The junction of a neuron with another neuron or with a muscle cell is called a(n) _________________.

14. Sensory receptors that respond to tissue damage are called ________________ receptors.

15. Peripheral nerve cells that receive information from both internal and external stimuli are called _________________.

16. The ________________ is the light-sensitive inner layer of the eye.

17. When light enters the eye, it activates photoreceptors called _________________, which respond to dim light, and _________________, which respond to bright light and colors.

18. The amount of light entering the eye is controlled by the _________________.

19. When light enters the eye, it passes first through the _________________.

20. The _________________ is a small, snail-shaped structure lined with hair cells.

21. The specialized hearing receptors found in the cochlea are ________________ cells.

22. A(n) _________________ is a globular cluster of cells specialized to detect chemicals found in foods.

23. High concentrations of pain receptors are located in the mouth and _________________.

24. _________________ are complex mixtures of chemicals and smoke particles produced by burning tobacco.

25. Drugs that decrease the activity of the central nervous system are known as _________________.

26. _______________ (BAC) is a measurement of the amount of alcohol in the blood.
27. Abuse of psychoactive drugs often leads to a state of uncontrollable physical or psychological dependence called ____________________.

28. Drugs that affect the functioning of the central nervous system are called ____________________ drugs.

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**Essay**

1. Explain why you cannot hold your breath indefinitely.

2. How is a signal transferred from one neuron to another neuron?

3. Briefly describe how sensory receptors help you maintain posture and keep your balance.

4. What are the effects of nicotine on the body?

5. Explain why addiction to mood-altering drugs is said to have a physiological basis.

6. Describe the action of cocaine at the synapse and the effects of long-term cocaine use on receptors.