

1. The two main divisions of the human nervous system are the:
  - A) central and peripheral.
  - B) central nervous system and diencephalon.
  - C) diencephalon and telencephalon.
  - D) myelencephalon and metencephalon.
  
2. What component of the human nervous system is known as the “information highway of the body”?
  - A) midbrain
  - B) spinal cord
  - C) central nervous system
  - D) peripheral nervous system
  
3. All of the following are functions of the spinal cord EXCEPT to:
  - A) organize motor outflow to muscles.
  - B) carry sensory information from the skin.
  - C) provide autonomic control of vital body functions.
  - D) regulate sleep and wake states.
  
4. Which of the following statements is NOT a function of the spinal cord as it relates to the body, that is, skin, muscles, joints, and internal organs?
  - A) The spinal cord carries sensory information from the body to the brain.
  - B) The spinal cord carries motor information from the brain to the body.
  - C) The spinal cord modulates sensory information en route from the body to the brain.
  - D) The spinal cord initiates motor commands to the body.
  
5. All of the following are considered primary divisions of the brain EXCEPT the:
  - A) hindbrain.
  - B) mesencephalon.
  - C) diencephalon.
  - D) forebrain.
  
6. The two subdivisions of the hindbrain are the:
  - A) myelencephalon and diencephalon.
  - B) myelencephalon and metencephalon.
  - C) diencephalon and telencephalon.
  - D) telencephalon and metencephalon.

7. The two subdivisions of the forebrain are the:
- A) myelencephalon and diencephalon.
  - B) myelencephalon and metencephalon.
  - C) diencephalon and telencephalon.
  - D) telencephalon and metencephalon.
8. The brainstem consists of the following nuclei EXCEPT the:
- A) midbrain.
  - B) cerebellum.
  - C) pons.
  - D) medulla.
9. The brain stem is involved in all of the following functions EXCEPT:
- A) attention.
  - B) filtering.
  - C) arousal.
  - D) behavioral alerting (vigilance).
10. The diencephalon includes all of the following EXCEPT:
- A) hypothalamus.
  - B) pituitary gland.
  - C) subthalamus.
  - D) cerebrum.
11. The cerebellum is important for:
- A) blood pressure.
  - B) respiration.
  - C) movement and posture.
  - D) sleep and wake states.
12. The term *ataxia* refers to:
- A) increased fatigue.
  - B) increased respiration.
  - C) decreased respiration.
  - D) decreased coordination.

13. Danika was recently in a car accident and received a blow to the back of the head. She now exhibits ataxia when she walks, which suggests that there has been further damage to her:
- A) hypothalamus.
  - B) cerebellum.
  - C) amygdala.
  - D) tectum.
14. The two nuclei within the midbrain are the:
- A) tectum and tegmentum.
  - B) tectum and ventral tegmental area.
  - C) substantia nigra and ventral tegmental area.
  - D) tegmentum and substantia nigra.
15. The “roof” of the midbrain is known as the:
- A) cerebellum.
  - B) tegmentum.
  - C) substantia nigra.
  - D) tectum.
16. The \_\_\_\_\_ is part of the limbic system and contains dopamine.
- A) tectum
  - B) tegmentum
  - C) substantia nigra
  - D) ventral tegmental area
17. The “reward circuit” in the brain is the:
- A) tectum.
  - B) tegmentum.
  - C) substantia nigra.
  - D) ventral tegmental area.
18. The thalamus and hypothalamus are the two subdivisions of the:
- A) myelencephalon.
  - B) metencephalon.
  - C) diencephalon.
  - D) telencephalon.

19. All of the following are hypothalamic functions EXCEPT:
- A) motor control.
  - B) body temperature regulation.
  - C) drinking regulation.
  - D) sexual behavior.
20. Releasing factors are produced by the:
- A) substantia nigra.
  - B) ventral tegmental area.
  - C) cerebellum.
  - D) hypothalamus.
21. The \_\_\_\_\_ relays sensory signals to the cortex.
- A) thalamus
  - B) hypothalamus
  - C) spinal cord
  - D) cerebellum
22. The relay station between multiple subcortical areas and the cerebral cortex is the:
- A) hypothalamus.
  - B) thalamus.
  - C) amygdala.
  - D) basal ganglia.
23. The basal ganglia and the limbic system are the two subdivisions of the:
- A) myelencephalon.
  - B) metencephalon.
  - C) diencephalon.
  - D) telencephalon.
24. All of the following are the major structures of the basal ganglia EXCEPT for the:
- A) globus pallidus.
  - B) thalamus.
  - C) putamen.
  - D) caudate nucleus.

25. The main function of the basal ganglia is:
- A) regulating sleep and wake states.
  - B) gating of sensory information.
  - C) integration of movement.
  - D) modulating emotions.
26. The major structures of the basal ganglia are sometimes collectively referred to as the:
- A) corpus callosum.
  - B) corpus striatum.
  - C) corpus christi.
  - D) motor nuclei.
27. Which brain region is involved in emotional processing?
- A) amygdala
  - B) thalamus
  - C) hypothalamus
  - D) hippocampus
28. The hypothalamus controls the following functions EXCEPT:
- A) eating.
  - B) drinking.
  - C) body temperature.
  - D) sensation.
29. The hypothalamus is a motivating force behind all the following behaviors, EXCEPT:
- A) the drive to eat.
  - B) the drive to drink.
  - C) the drive for sex.
  - D) the rage response.
30. The second major subdivision of the telencephalon is the:
- A) limbic system.
  - B) pons.
  - C) cerebellum.
  - D) medulla.

31. Which of the following is NOT a member of the limbic system?
- A) hypothalamus
  - B) amygdala
  - C) hippocampus
  - D) dopamine-rich reward centers
32. The cingulate cortex is responsible for:
- A) integrating sensory, motor, and emotional information.
  - B) regulating heart rate, blood pressure, and respiration.
  - C) motivating learning and facing challenges.
  - D) monitoring empathy, fairness, and social context.
33. The anterior cingulate cortex is responsible for:
- A) integrating sensory, motor, and emotional information.
  - B) regulating heart rate, blood pressure, and respiration.
  - C) motivating learning and facing challenges.
  - D) monitoring empathy, fairness, and social context.
34. The posterior cingulate cortex is responsible for:
- A) integrating sensory, motor, and emotional information.
  - B) regulating heart rate, blood pressure, and respiration.
  - C) motivating learning and facing challenges.
  - D) monitoring empathy, fairness, and social context.
35. All of the following are the four major lobes of the cerebral cortex EXCEPT:
- A) frontal.
  - B) temporal.
  - C) parietal.
  - D) orbital.
36. The occipital cortex is responsible for:
- A) hearing
  - B) vision
  - C) working memory
  - D) sensory perception

37. The parietal cortex is responsible for:
- A) hearing.
  - B) vision.
  - C) working memory.
  - D) sensory perception.
38. The temporal cortex is responsible for:
- A) hearing.
  - B) vision.
  - C) working memory.
  - D) sensory perception.
39. The frontal cortex is responsible for:
- A) hearing.
  - B) vision.
  - C) working memory.
  - D) sensory perception.
40. All of the following are tasks related to the dorsal-lateral prefrontal cortex EXCEPT:
- A) planning.
  - B) executive functions.
  - C) working memory.
  - D) sensory perception.
41. All of the following are tasks related to the dorsal-lateral prefrontal cortex EXCEPT:
- A) decision making.
  - B) emotion regulation.
  - C) working memory.
  - D) cognitive flexibility.
42. The ventral-lateral prefrontal cortex is responsible for:
- A) motor control.
  - B) evaluating rewards.
  - C) working memory.
  - D) motivation and emotions.

43. The insular cortex is known to process the sense of:
- A) ventral-lateral prefrontal cortex.
  - B) dorsal-lateral prefrontal cortex.
  - C) insular cortex.
  - D) temporal cortex.
44. Von Economo neurons are located in the:
- A) ventral-lateral prefrontal cortex.
  - B) dorsal-lateral prefrontal cortex.
  - C) insular cortex.
  - D) temporal cortex.
45. The Human Connectome Project is an investigation of the connections between:
- A) romantic relationships.
  - B) social groups.
  - C) memory and language.
  - D) various brain regions.
46. The basic cellular unit of the central nervous system is the:
- A) nerve.
  - B) tract.
  - C) axon.
  - D) neuron.
47. The two main cell types in the central nervous system are:
- A) astrocytes and oligodendrocytes.
  - B) neurons and glial cells.
  - C) glial cells and microglial cells.
  - D) ependymal and microglial cells.
48. Which of the following roles best describes glial cells?
- A) support and protection
  - B) relay sensory signals
  - C) emotional processing
  - D) memory processing

49. Which glial cell provides structural support to the central nervous system?
- A) astrocytes
  - B) oligodendrocytes
  - C) ependymal cells
  - D) microglial cells
50. Which glial cell forms the myelin sheath in the central nervous system?
- A) astrocytes
  - B) oligodendrocytes
  - C) ependymal cells
  - D) microglial cells
51. All of the following are roles of astrocytes EXCEPT for those that:
- A) provide nutrients.
  - B) maintain the extracellular environment.
  - C) regulate neurotransmitter reuptake.
  - D) clean up waste products.
52. All of the following are roles of astrocytes EXCEPT:
- A) modulate signal transmission
  - B) form the myelin sheath
  - C) synapse formation
  - D) promote recovery after injury
53. All of the following are roles of microglia EXCEPT for:
- A) pruning neurons.
  - B) forming the myelin sheath.
  - C) cleaning up damaged cells.
  - D) cleaning up debris.
54. Extensive pruning of neurons is characteristic of disorders, such as schizophrenia and Alzheimer's disease. This is likely to involve:
- A) astrocytes.
  - B) oligodendrocytes.
  - C) ependymal cells.
  - D) microglial cells.

55. The nucleus of a neural cell is found in the:
- A) soma.
  - B) dendrite.
  - C) axon.
  - D) presynaptic terminal.
56. The organelles of a neuron is found in the:
- A) soma.
  - B) dendrite.
  - C) axon.
  - D) presynaptic terminal.
57. In a neuron, the dendrites \_\_\_\_\_ signals, while the axon \_\_\_\_\_ signals.
- A) delay; amplifies
  - B) amplify; delays
  - C) receive; transmits
  - D) transmit receives
58. Which of the following indicates the correct order of information traveling through a neuron?
- A) Axon; soma; dendrites
  - B) Soma; dendrites; axon
  - C) Soma; axon; dendrites
  - D) Dendrites; soma; axon
59. The myelin sheath \_\_\_\_\_ signals.
- A) delays
  - B) speeds up
  - C) blocks
  - D) amplifies
60. The myelin sheath covers the:
- A) soma.
  - B) dendrites.
  - C) axon.
  - D) axon terminal.

61. A single neuron may have many \_\_\_\_\_ and only one \_\_\_\_\_.
- A) axons; dendrite
  - B) dendrites; axon
  - C) myelin sheaths; soma
  - D) somas; myelin sheath
62. *Neurogenesis* refers to:
- A) formation of new neurons.
  - B) rejuvenation of old neurons
  - C) coating of the myelin sheath
  - D) formation of a new axon
63. The conduction velocity of two neurons was compared. The action potential was conducted much faster in Neuron A than in Neuron B. These data suggest that:
- A) Neuron A is shorter than Neuron B.
  - B) Neuron B must possess a myelin sheath.
  - C) Neuron B is found in the spinal cord.
  - D) Neuron A possesses a myelin sheath.
64. Synaptic vesicles contain:
- A) organelles.
  - B) microglia.
  - C) neurotransmitters.
  - D) enzymes
65. In neurophysiology, exocytosis applies to:
- A) the neural cell body.
  - B) the presynaptic terminal of the neural cell.
  - C) the vesicles of the neural cell.
  - D) both the presynaptic terminal and the vesicles of the neural cell.
66. Exocytosis is initially triggered by:
- A) the synapse.
  - B) enzymes.
  - C) neurotransmitters.
  - D) the action potential.

67. When vesicles fuse with the presynaptic membrane, \_\_\_\_\_ occurs, that is, the release of the neurotransmitter into the synapse.
- A) endocytosis
  - B) exocytosis
  - C) synaptic transmission
  - D) transport
68. Neurotransmitters are stored in the:
- A) presynaptic terminal.
  - B) postsynaptic terminal.
  - C) soma.
  - D) dendrites.
69. Which of the following indicates the correct order of information traveling between two neurons?
- A) Synaptic cleft, dendrite terminal, axon terminal
  - B) Synaptic cleft, axon terminal, dendrite terminal
  - C) Axon terminal, synaptic cleft, dendrite terminal
  - D) Dendrite terminal, synaptic cleft, axon terminal
70. Which of the following indicates the correct order of information traveling between two neurons?
- A) Receptor attachment, diffuse across synapse, exocytosis
  - B) Exocytosis, diffuse across synapse, receptor attachment
  - C) Exocytosis, receptor attachment, diffuse across synapse
  - D) Diffuse across synapse, receptor attachment, exocytosis
71. Synaptic transmission is a(n) \_\_\_\_\_ process, and the action potential is a(n) \_\_\_\_\_ process.
- A) diffusion; enzymatic
  - B) enzymatic; diffusion
  - C) electrical; chemical
  - D) chemical; electrical
72. One of the important roles that autoreceptors have in synaptic transmission is to:
- A) reduce neurotransmitters.
  - B) increase neurotransmitters.
  - C) slow the action potential.
  - D) speed up the action potential.

73. Autoreceptors are located:
- A) inside the presynaptic terminal.
  - B) outside the presynaptic terminal.
  - C) inside the postsynaptic terminal.
  - D) outside the postsynaptic terminal.
74. Autoreceptors also function to:
- A) enhance synthesis and release of neurotransmitter.
  - B) reduce the synthesis and additional release of neurotransmitter.
  - C) reduce binding at the postsynaptic receptor and produce inhibition at the synapse.
  - D) augment synaptic transmission.
75. If an antagonist blocks an autoreceptor, neurotransmitters are:
- A) increased.
  - B) blocked.
  - C) metabolized.
  - D) reuptaked.
76. If an antagonist blocks an autoreceptor, neurotransmitters are:
- A) increased.
  - B) blocked.
  - C) metabolized.
  - D) reuptaked.
77. During synaptic transmission, \_\_\_\_\_ would cause the ion channels to open, and \_\_\_\_\_ would cause the synaptic vesicles to fuse with the terminal membrane.
- A) an action potential; neurotransmitters
  - B) enzymes; an action potential
  - C) an action potential; calcium
  - D) calcium; enzymes
78. When ion channels open along the presynaptic terminal, \_\_\_\_\_ tends to \_\_\_\_\_.
- A) neurotransmitters; enter the cell.
  - B) neurotransmitters; exit the cell.
  - C) calcium; enter the cell.
  - D) calcium; exit the cell.

79. The two main categories of monoamines are:
- A) acetylcholine and catecholamines.
  - B) enkephalins and endorphins.
  - C) indoleamines and catecholamines.
  - D) acetylcholine and indoleamines.
80. Catecholamines and indoleamines are subtypes of:
- A) purines.
  - B) opioids.
  - C) monoamines.
  - D) indoleamines.
81. Serotonin, dopamine, and epinephrine are types of:
- A) purines.
  - B) opioids.
  - C) monoamines.
  - D) indoleamines.
82. The enkephalins, endorphins, and dynorphins are subcategories of:
- A) purines.
  - B) opioids.
  - C) monoamines.
  - D) indoleamines.
83. The endocannabinoids are known as:
- A) purines.
  - B) opioids.
  - C) gases.
  - D) lipids.
84. All of the following are modulated by acetylcholine EXCEPT:
- A) language.
  - B) emotional.
  - C) memory.
  - D) sensory.

85. Administration of the psychedelic drug scopolamine results in the:
- A) blockade of postsynaptic ACh receptors.
  - B) increased degradation of ACh.
  - C) decreased synthesis of ACh.
  - D) increased levels of ACh.
86. Acetylcholine esterase (AChE) is known to \_\_\_\_\_ acetylcholine.
- A) metabolize
  - B) enhance
  - C) synthesize
  - D) store
87. Acetylcholine esterase (AChE) is located in the:
- A) presynaptic terminal.
  - B) postsynaptic terminal.
  - C) soma.
  - D) synaptic cleft.
88. Serotonin is a(n) \_\_\_\_\_, but it is also considered a(n) \_\_\_\_\_.
- A) indoleamine; monoamine
  - B) quaternary amine; monoamine
  - C) amino acid; neuropeptide
  - D) indoleamine; amino acid
89. Inhibition of acetylcholine esterase (AChE) results in the:
- A) blockade of postsynaptic ACh receptors.
  - B) increased degradation of ACh.
  - C) decreased synthesis of ACh.
  - D) increased levels of ACh.
90. Insecticides produce their effects by:
- A) blocking postsynaptic ACh receptors.
  - B) increasing degradation of ACh.
  - C) decreasing synthesis of ACh.
  - D) increasing levels of ACh.

91. Nerve gas, such as Sarin, produces its effects by:
- A) blocking postsynaptic ACh receptors.
  - B) increasing degradation of ACh.
  - C) decreasing synthesis of ACh.
  - D) increasing levels of ACh.
92. Reversible acetylcholine esterase (AChE) inhibitors are used clinically to treat:
- A) Parkinson's disease.
  - B) multiple sclerosis.
  - C) muscular dystrophy.
  - D) Alzheimer's disease.
93. Muscarinic receptors are:
- A) ionotropic.
  - B) metabotropic.
  - C) "fast."
  - D) presynaptic.
94. Nicotinic receptors are:
- A) ionotropic.
  - B) metabotropic.
  - C) "fast."
  - D) presynaptic.
95. Nicotinic receptors are \_\_\_\_\_, and muscarinic receptors are \_\_\_\_\_.
- A) metabotropic; ionotropic
  - B) ionotropic; metabotropic
  - C) "slow"; "fast"
  - D) presynaptic; postsynaptic
96. Nicotinic receptors are \_\_\_\_\_, and muscarinic receptors are \_\_\_\_\_.
- A) metabotropic; ionotropic
  - B) "fast"; "slow"
  - C) "slow"; "fast"
  - D) presynaptic; postsynaptic

97. Charlena has developed Alzheimer's disease. Current research suggests that she would benefit from drugs that activate the \_\_\_\_\_ muscarinic receptor.
- A) M<sub>2</sub>
  - B) M<sub>3</sub>
  - C) M<sub>4</sub>
  - D) N<sub>1</sub>
98. An experimental lesion is performed in a mouse resulting in a dramatic change in the amount of REM sleep displayed by the animal. Based on what you know about neurotransmitters, the most reasonable conclusion is that the circuit involved must use:
- A) dopamine.
  - B) acetylcholine.
  - C) glutamate.
  - D) GABA.
99. Monoamine oxidase (MAO) is a(n) \_\_\_\_\_, and acts by \_\_\_\_\_.
- A) amino acid; degrading
  - B) gas; synthesizing
  - C) enzyme; degrading
  - D) drug; enhancing
100. The catecholamines include all of the following neurotransmitters EXCEPT:
- A) norepinephrine (NE).
  - B) dopamine (DA).
  - C) serotonin (5-HT).
  - D) epinephrine (E).
101. The mechanism of action of the MAO inhibitor antidepressants is to:
- A) blockade of receptors (antagonist action).
  - B) blockade of neurotransmitter reuptake (reuptake inhibitor).
  - C) blockade of enzymatic breakdown of neurotransmitter.
  - D) increase in release of neurotransmitter.
102. The D<sub>1</sub> receptor family includes the \_\_\_\_\_ receptor subtype.
- A) D<sub>2A</sub>
  - B) D<sub>3</sub>
  - C) D<sub>4</sub>
  - D) D<sub>5</sub>

103. A new drug has been developed that improves psychotic symptoms in schizophrenics. Based on current knowledge in behavioral pharmacology, the \_\_\_\_\_ receptor is a possible site of action.
- A) D<sub>1</sub>
  - B) D<sub>5</sub>
  - C) D<sub>2A</sub>
  - D) D<sub>6B</sub>
104. Tyrosine is a precursor to:
- A) acetylcholine.
  - B) catecholamines.
  - C) indoleamines.
  - D) endocannabinoids.
105. Which of the following sequences is in the correct order for the biosynthesis pathway of the catecholamines?
- A) Tyrosine, dopa, dopamine
  - B) Dopamine, epinephrine, norepinephrine
  - C) Norepinephrine, epinephrine, dopamine
  - D) Tyrosine, norepinephrine, dopamine
106. Which of the following sequences is in the correct order for the biosynthesis pathway of the catecholamines?
- A) Dopa , tyrosine, dopamine
  - B) Dopamine, norepinephrine, epinephrine
  - C) Norepinephrine, epinephrine, dopamine
  - D) Tyrosine, norepinephrine, dopamine
107. The brain site responsible for producing the majority of the neurotransmitter norepinephrine (NE) in the brain is the:
- A) raphe nuclei.
  - B) substantia nigra.
  - C) basal ganglia.
  - D) locus coeruleus.

108. Cell bodies of the neurotransmitter norepinephrine (NE) originate from the \_\_\_\_; its precursor, the chemical from which it is directly converted, is \_\_\_\_.
- A) midbrain; l-DOPA
  - B) midbrain; dopamine
  - C) locus coeruleus; l-DOPA
  - D) locus coeruleus; dopamine
109. Dopamine pathways originate in the:
- A) cortex.
  - B) limbic system.
  - C) brain stem.
  - D) thalamus.
110. One dopamine pathway forms the “\_\_\_\_\_” circuit.
- A) motor
  - B) memory
  - C) emotion
  - D) reward
111. Drugs that affect the neurotransmitter dopamine (DA) are used clinically to treat:
- A) bipolar disorder.
  - B) schizophrenia.
  - C) panic disorder.
  - D) Alzheimer's disease.
112. Antipsychotic medications chiefly affect the neurotransmitter:
- A) NE.
  - B) DA.
  - C) 5-HT.
  - D) E.
113. The neurotransmitters most clearly implicated in reward mechanisms and orienting responses, respectively, are:
- A) 5-HT and DA.
  - B) DA and 5-HT.
  - C) DA and NE.
  - D) NE and DA.

114. Rex has developed an addiction to alcohol. One of the circuits in his brain that is likely to be affected is the pathway from the:
- A) hypothalamus to the pituitary gland.
  - B) substantia nigra to the basal ganglia.
  - C) ventral tegmental area to the limbic system.
  - D) ventral tegmental area to the thalamus.
115. The brain site responsible for producing the majority of the neurotransmitter serotonin (5-HT) in the brain is the:
- A) raphe nuclei.
  - B) substantia nigra.
  - C) basal ganglia.
  - D) locus coeruleus.
116. The neurotransmitter thought to be involved in a variety of processes including sleep, sex, affective disorders, and pain is:
- A) ACh.
  - B) DA.
  - C) 5-HT.
  - D) NE.
117. Which of the following sequences is in the correct order for the biosynthesis pathway of the serotonin?
- A) Tyrosine, tryptophan, 5-hydroxytryptophan
  - B) Tryptophan, tyrosine, 5-hydroxytryptamine
  - C) Tryptophan, 5-hydroxytryptophan, 5-hydroxytryptamine
  - D) 5-hydroxytryptamine, 5-hydroxytryptophan, tryptophan
118. The most common inhibitory and excitatory neurotransmitters in the brain are, respectively:
- A) NE and 5-HT.
  - B) NE and GABA.
  - C) glutamate and GABA.
  - D) GABA and glutamate.
119. Glutamate is an \_\_\_\_\_ neurotransmitter, which is categorized as a \_\_\_\_\_.
- A) excitatory; amino acid
  - B) excitatory; peptide
  - C) inhibitory; amino acid
  - D) inhibitory; peptide

120. Given their function, glutamate receptors are:
- A) only metabotropic.
  - B) only ionotropic.
  - C) either metabotropic or ionotropic.
  - D) none of the above.
121. NMDA receptors:
- A) require the presence of glycine to function properly.
  - B) involve magnesium ion activation.
  - C) require the influx of magnesium ions into the postsynaptic cell.
  - D) involve the influx of chloride into the cell.
122. The psychedelic drugs phencyclidine (PCP) and ketamine block receptors for the neurotransmitter:
- A) DA.
  - B) NE.
  - C) 5-HT.
  - D) glutamate.
123. Blockade of the following receptor produces effects ranging from hallucinations to protection from excitotoxicity and head injury:
- A) NMDA.
  - B) kainate.
  - C) AMPA.
  - D) quisqualate.
124. GABA is an \_\_\_\_\_ neurotransmitter, which is categorized as a \_\_\_\_\_.
- A) excitatory; amino acid
  - B) excitatory; peptide
  - C) inhibitory; amino acid
  - D) inhibitory; peptide
125. GABA is found in high concentrations in the:
- A) brain
  - B) spinal cord
  - C) brain and spinal cord
  - D) none of the above

126. \_\_\_\_\_ has been implicated in the pathogenesis, cognitive dysfunction, and negative symptoms of schizophrenia.
- A) GABA
  - B) Glutamate
  - C) Glycine
  - D) Substance P
127. GABA receptors can be:
- A) only metabotropic.
  - B) only ionotropic.
  - C) either metabotropic or ionotropic.
  - D) none of the above.
128. The benzodiazepine anxiolytics and barbiturate sedatives bind to the ligand-gated ion channel for the neurotransmitter:
- A) glutamate.
  - B) GABA.
  - C) 5-HT.
  - D) NE.
129. The endogenous opioids including the enkephalins and endorphins are \_\_\_\_\_ neurotransmitters.
- A) amino acid
  - B) classical
  - C) catecholamine
  - D) peptide
130. The analgesic and reinforcing properties of morphine is thought to involve the \_\_\_\_\_ opioid receptor.
- A) delta
  - B) omega
  - C) kappa
  - D) mu
131. Morphine, codeine, and heroin are thought to affect the neurotransmitter called:
- A) glutamate.
  - B) GABA.
  - C) opioids.
  - D) dopamine.

132. Substance P is a type of:

- A) peptide.
- B) enzyme.
- C) catecholamine.
- D) gas.

133. Substance P plays a role in transmitting sensory information, which affects:

- A) taste.
- B) hearing.
- C) vision.
- D) pain.

134. Adenosine plays a role in:

- A) learning.
- B) addiction.
- C) sleep.
- D) emotion.

## Answer Key

1. A
2. B
3. D
4. D
5. C
6. B
7. B
8. B
9. B
10. D
11. C
12. D
13. B
14. C
15. D
16. D
17. A
18. C
19. A
20. D
21. A
22. B
23. D
24. B
25. C
26. B
27. A
28. D
29. D
30. A
31. A
32. A
33. D
34. C
35. D
36. B
37. D
38. A
39. C
40. C
41. B
42. A
43. C
44. C

- 45. D
- 46. D
- 47. C
- 48. A
- 49. A
- 50. A
- 51. D
- 52. B
- 53. B
- 54. D
- 55. A
- 56. A
- 57. C
- 58. D
- 59. C
- 60. C
- 61. B
- 62. A
- 63. D
- 64. C
- 65. D
- 66. D
- 67. B
- 68. A
- 69. C
- 70. B
- 71. D
- 72. D
- 73. B
- 74. B
- 75. A
- 76. A
- 77. C
- 78. C
- 79. C
- 80. C
- 81. C
- 82. B
- 83. A
- 84. C
- 85. A
- 86. A
- 87. A
- 88. A
- 89. D
- 90. A

91. A
92. D
93. B
94. A
95. B
96. B
97. C
98. B
99. C
100. C
101. C
102. D
103. C
104. D
105. A
106. B
107. D
108. D
109. C
110. C
111. B
112. B
113. C
114. C
115. A
116. C
117. A
118. D
119. A
120. C
121. A
122. D
123. A
124. C
125. C
126. B
127. C
128. B
129. D
130. D
131. C
132. A
133. D
134. C