

# A-LEVEL

## Multiple-choice questions on neural coordination .

**1. Which cells are responsible for transmitting electrical signals in the nervous system?**

- A) Neurons
- B) Glial cells
- C) Astrocytes
- D) Oligodendrocytes

**Answer: A**

Explanation: Neurons are the primary cells responsible for transmitting electrical signals in the nervous system.

**2. What is the function of dendrites in a neuron?**

- A) Transmitting signals away from the cell body
- B) Receiving signals from other neurons
- C) Producing neurotransmitters
- D) Insulating the axon

**Answer: B**

Explanation: Dendrites receive signals from other neurons and transmit them toward the cell body.

**3. Which part of the neuron is responsible for the long-distance transmission of signals to other neurons or muscles?**

- A) Cell body
- B) Dendrites
- C) Axon
- D) Synapse

**Answer: C**

Explanation: The axon is responsible for transmitting signals over long distances to other neurons or muscles.

**4. What is the term for the junction between two neurons where signals are transmitted from one to the other?**

- A) Nucleus
- B) Synapse
- C) Myelin sheath
- D) Node of Ranvier

**Answer: B**

Explanation: The synapse is the junction where signals are transmitted from one neuron to another.

**5. Which neurotransmitter is commonly associated with feelings of pleasure and reward?**

- A) Serotonin
- B) Dopamine
- C) Acetylcholine
- D) GABA

**Answer: B**

Explanation: Dopamine is associated with pleasure and reward in the brain.

**6. What is the function of the myelin sheath in a neuron?**

- A) Transmitting signals
- B) Insulating the axon
- C) Releasing neurotransmitters
- D) Receiving signals

**Answer: B**

Explanation: The myelin sheath insulates the axon, speeding up the transmission of signals.

**7. Which part of the nervous system is responsible for the "fight or flight" response during stress?**

- A) Sympathetic nervous system
- B) Parasympathetic nervous system
- C) Central nervous system

D) Peripheral nervous system

**Answer: A**

Explanation: The sympathetic nervous system is responsible for the "fight or flight" response.

**8. Which structure in the brain is responsible for coordinating voluntary muscle movements and maintaining balance?**

A) Medulla oblongata

B) Cerebellum

C) Hypothalamus

D) Thalamus

**Answer: B**

Explanation: The cerebellum is responsible for coordinating voluntary muscle movements and maintaining balance.

**9. What is the role of the thalamus in the brain?**

A) Regulation of body temperature

B) Relay station for sensory information

C) Emotional processing

D) Hormone production

**Answer: B**

Explanation: The thalamus acts as a relay station for sensory information in the brain.

**10. Which neurotransmitter is deficient in individuals with Parkinson's disease?**

A) Serotonin

- B) Dopamine
- C) Acetylcholine
- D) GABA

**Answer: B**

Explanation: Parkinson's disease is associated with a deficiency of dopamine in the brain.

**11. Which division of the nervous system controls involuntary bodily functions such as heartbeat and digestion?**

- A) Central nervous system
- B) Peripheral nervous system
- C) Autonomic nervous system
- D) Somatic nervous system

**Answer: C**

Explanation: The autonomic nervous system controls involuntary bodily functions.

**12. What is the function of the hypothalamus in the brain?**

- A) Coordinating muscle movements
- B) Regulating body temperature
- C) Relay station for sensory information
- D) Emotional processing

**Answer: B**

Explanation: The hypothalamus is involved in regulating body temperature among other functions.

**13. Which part of the brain is responsible for the regulation of sleep and wake cycles?**

- A) Medulla oblongata
- B) Pons
- C) Thalamus
- D) Pineal gland

**Answer: D**

Explanation: The pineal gland, through the secretion of melatonin, regulates sleep and wake cycles.

**14. What is the primary function of the amygdala in the brain?**

- A) Memory formation
- B) Emotional processing, including fear and pleasure
- C) Motor coordination
- D) Language comprehension

**Answer: B**

Explanation: The amygdala is involved in emotional processing, including fear and pleasure.

**15. Which part of the peripheral nervous system is responsible for transmitting sensory information to the central nervous system?**

- A) Somatic nervous system
- B) Autonomic nervous system
- C) Sympathetic nervous system
- D) Sensory nervous system

**Answer: D**

Explanation: The sensory nervous system transmits sensory information to the central nervous system.

**16. In which stage of sleep do rapid eye movements (REM) occur?**

- A) Stage 1
- B) Stage 2
- C) Stage 3
- D) REM Sleep

**Answer: D**

Explanation: Rapid eye movements (REM) occur during the REM sleep stage.

**17. What is the function of the corpus callosum in the brain?**

- A) Regulating body temperature
- B) Connecting the left and right hemispheres
- C) Coordinating muscle movements
- D) Controlling hormone production

**Answer: B**

Explanation: The corpus callosum connects the left and right hemispheres of the brain, facilitating communication between them.

**18. Which neurotransmitter is associated with mood regulation and is often targeted in the treatment of depression?**

- A) Serotonin

- B) Dopamine
- C) Acetylcholine
- D) GABA

**Answer: A**

Explanation: Serotonin is associated with mood regulation, and deficiencies are linked to depression.

**19. What is the role of the medulla oblongata in the brainstem?**

- A) Coordinating voluntary muscle movements
- B) Regulating heartbeat and breathing
- C) Emotional processing
- D) Relay station for sensory information

**Answer: B**

Explanation: The medulla oblongata is responsible for regulating heartbeat and breathing.

**20. Which part of the nervous system is responsible for reflex actions that occur without conscious thought?**

- A) Somatic nervous system
- B) Autonomic nervous system
- C) Sympathetic nervous system
- D) Reflexive nervous system

**Answer: A**

Explanation: Reflex actions are controlled by the somatic nervous system.



**21. What is the primary function of the frontal lobe in the cerebral cortex?**

- A) Processing visual information
- B) Motor control and decision-making
- C) Auditory processing
- D) Memory formation

**Answer: B**

Explanation: The frontal lobe is involved in motor control and decision-making.

**22. Which neurotransmitter is inhibitory and is often associated with relaxation and reduced anxiety?**

- A) Serotonin
- B) Dopamine
- C) Acetylcholine
- D) GABA

**Answer: D**

Explanation: GABA (gamma-aminobutyric acid) is an inhibitory neurotransmitter associated with relaxation.

**23. What is the main function of the Broca's area in the brain?**

- A) Visual processing
- B) Speech production and language comprehension
- C) Motor coordination
- D) Emotional processing

**Answer: B**

Explanation: Broca's area is associated with speech production and language comprehension.

**24. Which part of the brain is responsible for long-term memory formation?**

- A) Hippocampus
- B) Amygdala
- C) Thalamus
- D) Cerebellum

**Answer: A**

Explanation: The hippocampus is crucial for long-term memory formation.

**25. What is the function of the pituitary gland in the brain?**

- A) Regulating body temperature
- B) Producing neurotransmitters
- C) Controlling hormone production
- D) Motor coordination

**Answer: C**

Explanation: The pituitary gland controls hormone production and is often referred to as the "master gland."

**26. Which neurotransmitter is involved in muscle contraction and is released at the neuromuscular junction?**

- A) Serotonin

- B) Dopamine
- C) Acetylcholine
- D) GABA

**Answer: C**

Explanation: Acetylcholine is the neurotransmitter responsible for muscle contraction at the neuromuscular junction.

**27. What is the role of the Wernicke's area in the brain?**

- A) Emotional processing
- B) Speech comprehension and language understanding
- C) Motor coordination
- D) Visual processing

**Answer: B**

Explanation: Wernicke's area is associated with speech comprehension and language understanding.

**28. Which part of the brainstem is responsible for regulating sleep and wake cycles, as well as arousal?**

- A) Pons
- B) Medulla oblongata
- C) Reticular formation
- D) Hypothalamus

**Answer: C**

Explanation: The reticular formation is involved in regulating sleep and wake cycles and arousal.

**29. What is the function of Schwann cells in the nervous system?**

- A) Transmitting signals
- B) Insulating the axon
- C) Releasing neurotransmitters
- D) Receiving signals

**Answer: B**

Explanation: Schwann cells provide insulation to the axon, facilitating faster signal transmission.

**30. Which part of the autonomic nervous system is responsible for "rest and digest" activities?**

- A) Sympathetic nervous system
- B) Parasympathetic nervous system
- C) Enteric nervous system
- D) Central nervous system

**Answer: B**

Explanation: The parasympathetic nervous system is responsible for "rest and digest" activities.

**31. In the context of neural coordination, what is synaptic plasticity?**

- A) The ability of neurons to transmit signals rapidly
- B) The strengthening or weakening of synapses over time

- C) The automatic response to a stimulus
- D) The insulation of the axon

**Answer: B**

Explanation: Synaptic plasticity refers to the ability of synapses to strengthen or weaken over time.

**32. Which neurotransmitter is associated with mood stabilization and is targeted in the treatment of bipolar disorder?**

- A) Serotonin
- B) Dopamine
- C) Acetylcholine
- D) Lithium

**Answer: D**

Explanation: Lithium, not a neurotransmitter, is used for mood stabilization in bipolar disorder treatment.

**33. What is the primary function of the reticular activating system (RAS) in the brainstem?**

- A) Regulating body temperature
- B) Coordinating voluntary muscle movements
- C) Controlling arousal and attention
- D) Emotional processing

**Answer: C**

Explanation: The reticular activating system is responsible for controlling arousal and attention.

**34. Which division of the nervous system is responsible for voluntary muscle movements and sensory perception?**

- A) Sympathetic nervous system
- B) Parasympathetic nervous system
- C) Somatic nervous system
- D) Autonomic nervous system

**Answer: C**

Explanation: The somatic nervous system controls voluntary muscle movements and sensory perception.

**35. In the context of neural coordination, what is the role of a neurotransmitter inhibitor?**

- A) Enhancing the effect of neurotransmitters
- B) Blocking the release of neurotransmitters
- C) Increasing the number of receptors
- D) Facilitating reuptake of neurotransmitters

**Answer: B**

Explanation: Neurotransmitter inhibitors block the release of neurotransmitters.

**36. What is the function of the limbic system in the brain?**

- A) Regulating body temperature
- B) Coordinating voluntary muscle movements
- C) Emotional processing and memory formation
- D) Controlling hormone production

**Answer: C**

Explanation: The limbic system is involved in emotional processing and memory formation.

**37. Which part of the brain is responsible for the production of melatonin, influencing sleep patterns?**

- A) Hypothalamus
- B) Thalamus
- C) Pineal gland
- D) Amygdala

**Answer: C**

Explanation: The pineal gland produces melatonin, influencing sleep patterns.

**38. What is the primary function of the enteric nervous system?**

- A) Regulating body temperature
- B) Controlling hormone production
- C) Coordinating digestion and gut function
- D) Relay station for sensory information

**Answer: C**

Explanation: The enteric nervous system coordinates digestion and gut function.