

Advanced Neuroscience Principles

Neuroscience · Answer Key · 8 Questions

1. Which specific thalamic nucleus serves as the primary relay for visual information to the primary visual cortex?

- A) Pulvinar nucleus
- B) Lateral geniculate nucleus**
- C) Medial geniculate nucleus
- D) Ventral posterolateral nucleus

2. The Broca's area, responsible for speech production, is traditionally located in which lobe of the cerebral cortex?

- A) Temporal lobe
- B) Parietal lobe
- C) Frontal lobe**
- D) Occipital lobe

3. Which neurotransmitter is primarily responsible for inhibitory signaling in the adult mammalian central nervous system?

- A) Glutamate
- B) Gamma-aminobutyric acid**
- C) Acetylcholine
- D) Norepinephrine

4. What is the specialized extracellular matrix structure that surrounds certain neurons, particularly parvalbumin-expressing interneurons?

- A) Perineuronal nets**
- B) Nodes of Ranvier
- C) Astrocytic end-feet
- D) Synaptic clefts

5. In the human spinal cord, which tract is primarily responsible for carrying fine touch, vibration, and proprioceptive information to the brain?

- A) Spinothalamic tract
- B) Corticospinal tract
- C) Dorsal column-medial lemniscal pathway**
- D) Rubrospinal tract

6. Which cranial nerve is responsible for the motor innervation of the lateral rectus muscle of the eye?

- A) Oculomotor nerve
- B) Trochlear nerve
- C) Abducens nerve**
- D) Trigeminal nerve

7. What is the primary function of the locus coeruleus in the brainstem?

- A) Regulation of circadian rhythms
- B) Synthesis and release of norepinephrine**
- C) Control of saccadic eye movements
- D) Processing of gustatory stimuli

8. The 'saltatory conduction' of action potentials occurs primarily due to the presence of which structural feature?

- A) Dendritic spines
- B) Myelin sheath**
- C) Golgi apparatus
- D) Microtubules