EPPP Biological Bases of Behavior Practice Exam (Sample)

Study Guide

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Questions

1. Which type of medical imaging requires anesthesia and is invasive to visualize the vasculature?

A. Neuroangiography

B. Magnetic Resonance Imaging

C. X-ray

D. Computed Tomography

2. Which type of dementia is associated with changes in personality, executive dysfunction, and language difficulties?

A. Alzheimer's Disease

B. Parkinson's Disease

C. Pick's Disease

D. Huntington's Disease

3. Which term describes the condition of having difficulty in coordinating movements?

A. Ataxia

B. Alexia

C. Agraphia

D. Apraxia

4. What term describes the loss of ability to comprehend or formulate language?

A. Aphasia

B. Apraxia

C. Dyslexia

D. Agnosia

5. What is the extending arm of the neuron called?

A. Axon

B. Dendrite

C. Cortex

D. Glia

6. What condition involves diseases of the brain's vasculature that can lead to strokes and lesions?

A. Cerebrovascular Disease

B. Alzheimer's Disease

C. Frontotemporal Dementia

D. Vascular Dementia

7. What type of brain cells are primarily responsible for transmitting and interpreting signals?

A. Glia

B. Neurons

C. Synapses

D. Axons

8. What term describes movement disorders that are induced by drugs?

A. Akathisia

B. Extrapyramidal Symptoms

C. Tardive Dyskinesia

D. Dystonia

9. What is the term for the controlling part of the nervous system that includes the brain and spinal cord?

A. Autonomic Nervous System

B. Central Nervous System

C. Peripheral Nervous System

D. Endocrine System

10. What term refers to the collection of neurons in the cerebrum specifically structured in six layers?

A. Cortex

B. Glia

C. Myelin Sheath

D. Synapse

Answers

1. A
2. C
3. A
4. A
5. A
6. A
7. B
8. B
9. B
10. A

Explanations

1. Which type of medical imaging requires anesthesia and is invasive to visualize the vasculature?

A. Neuroangiography

B. Magnetic Resonance Imaging

C. X-ray

D. Computed Tomography

Neuroangiography is the correct answer because it involves the use of a catheter that is inserted into the vascular system, typically through the groin or arm. This invasive procedure allows for the visualization of the brain's vascular structures and is particularly useful for diagnosing conditions such as aneurysms, arteriovenous malformations, and blockages. Anesthesia is often required to minimize discomfort and ensure the patient's stillness during the procedure, which allows for high-quality images to be captured. The other imaging methods listed do not share these characteristics. Magnetic Resonance Imaging (MRI) is a non-invasive imaging technique that does not require anesthesia, although it may sometimes be used in certain contexts to help patients remain still. X-ray imaging is also a standard non-invasive method that does not involve anesthesia or catheterization, focusing instead on providing quick imaging of structures based on their density. Computed Tomography (CT) scanning, like X-rays, is typically non-invasive; both techniques can visualize internal structures but do not require catheter insertion or anesthesia for standard applications.

2. Which type of dementia is associated with changes in personality, executive dysfunction, and language difficulties?

A. Alzheimer's Disease

B. Parkinson's Disease

C. Pick's Disease

D. Huntington's Disease

Pick's disease, also known as frontotemporal dementia, is characterized by early and prominent changes in personality, executive dysfunction, and language difficulties. This form of dementia primarily affects the frontal and temporal lobes of the brain, which are crucial for regulating behavior, decision-making, and language skills. Individuals with Pick's disease often exhibit significant personality changes, such as increased impulsivity, inappropriate social behavior, or apathy, which can drastically affect their interpersonal relationships and daily functioning. Furthermore, executive dysfunction manifests as challenges in planning, organizing, and managing tasks, making it hard for them to navigate everyday activities. Language difficulties, such as difficulties with word retrieval or understanding language, may also be prevalent, further impacting communication abilities. In contrast, Alzheimer's disease typically begins with memory loss and gradual cognitive decline but may not prominently feature the same degree of personality changes or executive dysfunction early on. Parkinson's disease is primarily motor-related and includes cognitive symptoms, but the main symptoms are related to movement and coordination. Huntington's disease involves a combination of movement, cognitive issues, and psychiatric symptoms but does not primarily center on the personality and language changes seen in Pick's disease. Thus, Pick's disease stands out for its distinctive symptom profile, particularly in relation to personality,

3. Which term describes the condition of having difficulty in coordinating movements?

A. Ataxia

B. Alexia

C. Agraphia

D. Apraxia

Ataxia refers specifically to a lack of voluntary coordination of muscle movements, which can manifest as difficulties with balance, gait, and fine motor skills. It is often caused by damage to the cerebellum, the area of the brain that plays a crucial role in regulating movement and coordination. Individuals with ataxia may experience unsteady walking or issues with tasks that require precise movements, such as writing or buttoning a shirt. Understanding ataxia is important in various contexts, such as neurology and rehabilitation, where interventions might be tailored to improve motor coordination. The identification of ataxia can also aid in diagnosing underlying neurological issues that may be contributing to the coordination problems.

4. What term describes the loss of ability to comprehend or formulate language?

A. Aphasia

B. Apraxia

C. Dyslexia

D. Agnosia

The term that describes the loss of ability to comprehend or formulate language is aphasia. This condition is typically the result of damage to specific areas of the brain that are responsible for language processing, such as Broca's area or Wernicke's area. Individuals with aphasia can experience a range of difficulties, including issues with speaking, understanding spoken language, reading, and writing, depending on the subtype and severity of the condition. Aphasia can arise from various causes, most commonly stroke, head injury, or brain tumors, and it highlights the critical role of certain brain structures in our ability to communicate effectively. Understanding aphasia is essential for those studying biological bases of behavior, as it exemplifies the connection between neurological function and cognitive abilities.

5. What is the extending arm of the neuron called?

A. Axon

B. Dendrite

C. Cortex

D. Glia

The extending arm of the neuron is known as the axon. The axon is a long, thin projection that conducts electrical impulses away from the neuron's cell body to other neurons, muscles, or glands. This structure is crucial for transmitting information throughout the nervous system, allowing for communication between brain regions and between the brain and the rest of the body. The axon can vary in length and is often surrounded by a myelin sheath, which enhances the speed of impulse transmission. In contrast, dendrites are branched extensions from the neuron's cell body that receive signals from other neurons. The cortex refers to the outer layer of the brain, involved in higher-level functions such as perception and decision-making. Glia, or glial cells, provide support and protection for neurons but do not transmit information in the same manner as axons do. Understanding the function and anatomy of the axon is key to grasping how neurons communicate and how information processing occurs in the nervous system.

6. What condition involves diseases of the brain's vasculature that can lead to strokes and lesions?

A. Cerebrovascular Disease

B. Alzheimer's Disease

C. Frontotemporal Dementia

D. Vascular Dementia

Cerebrovascular disease encompasses a range of disorders that affect the blood vessels of the brain, which can result in strokes and lesions. This condition is primarily related to issues such as reduced blood flow, blockages, or bleeding within the brain's vascular system. Strokes, which can be ischemic or hemorrhagic, are a direct consequence of cerebrovascular disease. While other conditions like vascular dementia are indeed associated with impaired blood flow and may lead to cognitive decline, cerebrovascular disease is broader and includes all pathology affecting the brain's circulation. Alzheimer's disease and frontotemporal dementia are primarily neurodegenerative disorders associated with specific types of brain cell damage rather than direct vascular issues. Thus, cerebrovascular disease is the most accurate term to describe conditions related to diseases of the brain's vasculature leading to strokes and lesions.

7. What type of brain cells are primarily responsible for transmitting and interpreting signals?

A. Glia

B. Neurons

C. Synapses

D. Axons

Neurons are the fundamental units of the nervous system that are primarily responsible for transmitting and interpreting signals. These specialized cells are equipped with the ability to generate and conduct electrical impulses, known as action potentials, which enable communication within the brain and between the brain and the rest of the body. Neurons consist of three major parts: the cell body (soma), dendrites, and axons. Dendrites receive incoming signals from other neurons, while axons transmit signals to other neurons or muscle cells. The synapses are the junctions where neurons communicate, but they are not cells themselves; rather, they are structures that facilitate communication between neurons. Glial cells, on the other hand, provide support, protection, and nourishment to neurons but do not transmit signals. Axons are parts of neurons that specifically carry electrical signals away from the cell body but cannot function on their own without the neuronal structure. Thus, neurons are the primary cells responsible for the processes of signal transmission and interpretation.

8. What term describes movement disorders that are induced by drugs?

A. Akathisia

B. Extrapyramidal Symptoms

C. Tardive Dyskinesia

D. Dystonia

The term that describes movement disorders induced by drugs is extrapyramidal symptoms. These symptoms are often associated with the use of antipsychotic medications, particularly first-generation antipsychotics, which can interfere with the normal functioning of the extrapyramidal system—the part of the central nervous system that coordinates movement. Extrapyramidal symptoms encompass a range of movement-related side effects, including tremors, rigidity, bradykinesia, and postural instability, which mimic disorders such as Parkinson's disease. These reactions occur due to the blockage of dopamine receptors in the basal ganglia, which plays a critical role in the regulation of smooth and coordinated muscle movements. While akathisia, tardive dyskinesia, and dystonia are specific types of movement disorders that can also be classified under extrapyramidal symptoms, they represent more narrowly defined conditions. Akathisia is a state of restlessness and an urgent need for movement; tardive dyskinesia involves repetitive, involuntary movements often occurring after long-term use of antipsychotics, and dystonia is characterized by sustained muscle contractions. However, extrapyramidal symptoms is the overarching term encompassing these various movement disorders induced by drugs.

9. What is the term for the controlling part of the nervous system that includes the brain and spinal cord?

A. Autonomic Nervous System

B. Central Nervous System

C. Peripheral Nervous System

D. Endocrine System

The term that refers to the controlling part of the nervous system, encompassing the brain and spinal cord, is the Central Nervous System. This system is integral to the processing and integration of sensory information, as well as controlling voluntary and involuntary movements. It is the main command center for the body, coordinating actions and responses based on incoming stimuli. The Central Nervous System is distinct from the Peripheral Nervous System, which includes all the nerves outside of the brain and spinal cord and is primarily responsible for carrying signals to and from different parts of the body. Understanding the roles of these systems is fundamental in neuroscience and psychology, as it highlights how the brain and spinal cord function as the core processors of information for behavior and bodily functions.

10. What term refers to the collection of neurons in the cerebrum specifically structured in six layers?

A. Cortex

B. Glia

C. Myelin Sheath

D. Synapse

The term that refers to the collection of neurons in the cerebrum specifically structured in six layers is the cortex. The cerebral cortex is the outermost layer of the brain, composed of gray matter and is predominantly made up of neuronal cell bodies. This intricate arrangement allows for complex processing and integration of information. The six-layered structure results in different types of neurons and varying functions, contributing to higher cognitive functions, such as language, perception, and decision-making. The other terms in the options do not refer to this specific structure. Glia are support cells in the nervous system, which facilitate communication, maintain homeostasis, and provide support and protection for neurons, but they do not consist of layered neurons like the cortex does. Myelin sheath refers to the fatty insulating layer around the nerves that helps increase the speed of electrical impulses along the axon but does not involve neuron layers. Synapse denotes the junction between two neurons where communication occurs, rather than a collection or structure of neurons themselves. Thus, the cortex is the appropriate answer, given its distinct six-layered neuronal organization.