Neurophysiology Past Paper & Test Bank.

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- Micro stimulation of which of the following would lead to contraction of individual muscle fibers:
- a. Primary motor cortex.
- b. Premotor cortex.
- c. Supplementary motor cortex.
- d. Somatosensory association area of the cortex.
- e. The limbic association area.
- Answer: A

- The precentral gyrus and corticospinal tract are essential for which of the following:
- a. Voluntary movement.
- b. Vision.
- c. Olfaction.
- d. Proprioception.
- e. Auditory identification.
- Answer: a

- The place which is responsible of arranging the muscles during speaking is:
- a. Broca’s area.
- b. Werneck's area.
- c. sensory aphasia.
- d. area in temporal lobe.
- e. area in occipital lobe.
- Answer: a

- The “limb” regions of the motor homunculus are involved in activating motor neurons that move the arms, hands, and legs primarily on the _____, and the trunk regions of the motor homunculus are primarily involved in activating motor neurons that move the trunk primarily on the _____.
- a. same side of the body; opposite side of the body.
- b. opposite side of the body; opposite side of the body.
- c. same side of the body; same side of the body.
- d. opposite side of the body; opposite side of the body.
- e. both sides of the body; both sides of the body.
- Answer: d

- The area of the motor cortex that is devoted to a particular region of the body is proportional to the:
- a. distance of the body area from the brain.
- b. number of sensory receptors in the area of the body.
- c. size of the body area.
- d. number of motor units in that region.
- e. size of the nerves that serve the area of the body.
- Answer: d

- Which of the following comments regarding lateral corticospinal tract is FALSE:
- a. It contains around 90% fiber of the corticospinal pathway.
- b. It decussates at the level of medullary pyramids.
- c. It innervates lateral nuclei in the anterior horn.
- d. It controls axial muscle mainly and so is important for posture regulation.
- e. It originates from large areas from the cerebral cortex.
- Answer: d

- Cortical representation of somatic sensation lies in:
- a. Central sulcus.
- b. Frontal lobe.
- c. Posterior temporal cortex.
- d. Parietal lobe.
- e. Pre-central gyrus.
- Answer: d

- Muscle rigidity demonstrated in basal ganglia diseases is caused primarily by:
- a. A resting high tonic discharge of globes pallidus to thalamus.
- b. A resting high tonic discharge of substantia nigra reticulata to thalamus.
- c. Disinhibition of subthalamic output caused by increased striatal output to globus pallidus.
- d. Disinhibition of thalamus output caused by increased striatal (caudate and putamen) output to globus pallidus.
- e. Overstimulation of substantia nigra compacta dopaminergic neurons to striatum.
- Answer: d

- Regarding the role of the basal ganglia in motor control:
- a. Disorders of the basal ganglia produce a marked loss of both sensation and motor control.
- b. Parkinsonism is caused by neuronal degeneration within the substantia nigra.
- c. The globes pallidus projects directly to the cerebral cortex.
- d. Acetylcholine is the predominant neurotransmitter of the substantia nigra.
- e. Chorea is a speech disorder caused by disease of basal ganglia.
- Answer: b

- Concerning the functions of the basal ganglia:
- a. is mainly stimulatory to muscle tone.
- b. degeneration of the substantia nigra dopaminergic neurons might lead to action tremor.
- c. putamen circuit helps corticospinal system to execute conscious learned complex patterns of movements.
- d. caudate nucleus in association with motor cortex achieve complex ipsilateral movements.
- e. plays a very important role in sensory perception.
- Answer: b

- Which of the following is NOT a sign of basal ganglia disease:
- a. Athetosis.
- b. Nystagmus.
- c. Chorea.
- d. Increased muscle tone.
- e. Ballismus.
- Answer: b

- Chief inhibitory neurotransmitter in the basal ganglia is:
- a. Acetylcholine.
- b. Noradrenaline.
- c. Dopamine.
- d. GABA.
- e. Glutamate.
- Answer: d

- The cerebellum:
- a. Is unable to make corrective adjustment to the movement once it is performed.
- b. Is not involved in the planning of a movement, only its execution.
- c. Does not receive feedback from muscles that execute the actual movement.
- d. Directly stimulates motor neurons required to make a movement.
- e. Plays an active role in the coordination of muscles required to make a movement.
- Answer: e

- Destruction of cerebellum leads to the following EXCEPT:
- a. Impaired learning of coordination of repetitive tasks.
- b. Dysmetria.
- c. Dysdiadochokinesia.
- d. Hypertonia (rigidity).
- e. Ataxia.
- Answer: d

- The intermediate zone of the cerebellum:
- a. compares the intentions of the higher motor centers with the actual movement of the muscles and correct any deviations from the intended movement.
- b. plays a role in the planning and initiation of voluntary activity.
- c. inhibit muscle tone.
- d. controls eye movements.
- e. is important for the maintenance of balance.
- Answer: a

- Rigidity of the axial and antigravity muscles when cortical control over the brain stem is interrupted (decerebrate) is due to:
- a. over activity of rubrospinal tract.
- b. over activity of medullary reticulospinal tract.
- c. over activity of pontine reticulospinal tract.
- d. disruption of the dorsal spinocerebellar pathway.
- e. disruption of the lateral vestibulospinal tract.
- Answer: c (“midterm anatomy material”)

- Which of the following about the cerebellum are paired correctly:
- a. cerebellar dysfunction → athetosis and hemiballismus.
- b. spinocerebellum and sequencing → timing of motor movements.
- c. lateral cerebellar hemisphere → coordination of axial muscles.
- d. purkinje cells → inhibitory input to deep nuclear cells of cerebellum.
- e. vestibulocerebellum (flocculonodular lobe) → coordination of voluntary movements of the distal flexors.
- Answer: d

- The _____ controls the motor orders while the _____compares the intended movement with actual movement for the improvement of movement skill.
- a. Motor cortex; cerebellum.
- b. Cerebellum; basal ganglia.
- c. Basal ganglia; motor cortex.
- d. Basal ganglia; cerebellum.
- e. Cerebellum; red nucleus.
- Answer: A

- All of the following is Efferent pathway from the cerebellum, except:
- a. olivocerebellar tract.
- b. vestibulocerebellar tract.
- c. spinocerebellar tract.
- d. corticopontocerebellar pathway.
- e. corticomedullarycerebellar pathway.
- Answer: c

- A patient presents with an intention tremor, dysarthria (scanning speech), inability of the movements to reach the target accurately and "drunken" gait. This patient might be expected to have a lesion involving the:
- a. Red nucleus.
- b. Precentral gyrus.
- c. Cerebellum.
- d. Caudate and putamen.
- e. Vestibulocochlear nerve.
- Answer: c

- Inability of a person to understand the meaning of spoken words:
- a. Results from lesion in primary visual area.
- b. Results from lesion in the temporal lobe.
- c. Is a type of sensory aphasia.
- d. Results from lesion in Broca's area.
- e. Is a type of motor aphasia.
- Answer: c

- The area of the brain that is needed to understand the meaning of words and forms an idea is:
- a. Prefrontal cortex.
- b. Wernicke's area.
- c. Primary motor cortex.
- d. Broca's area.
- e. Premotor cortex.
- Answer: b

- Short term memory is characterized by:
- a. Has permanent anatomical and/or chemical changes in the brain areas.
- b. Has fast recall time.
- c. Does not need registration of information.
- d. Needs consolidation of information.
- e. It has large capacity.
- Answer: b

- A patient with an inability to write or to generate meaningful speech i.e (language, even though he can understand requesis and make sounds), most likely has a lesion in the:
- a. Left parietal lobe.
- b. Left temporal lobe.
- c. Right frontal lobe.
- d. Left frontal lobe.
- e. Right temporal lobe.
- Answer: d

- Lesions of the speech center in the frontal lobe results in:
- a. Inability to select appropriate words for use in speech-language comprehension.
- b. Failure of coordination of speech muscles.
- c. Inability to understand spoken language.
- d. Sensory aphasia.
- e. Paralysis of speech muscles.
- Answer: b

- A person with hemorrhage that affects the internal capsular fibers and hemiplegia and has aphasia, most probably his/her lesion is located at:
- a. Basal ganglia.
- b. Cerebellum.
- c. Hypothalamus.
- d. Left cerebral hemisphere.
- e. Right cerebral hemisphere.
- Answer: d

- A young college student was observed to have marked change of behavior following a fall on his head in which he sustained skull (broken) fracture. He is apathetic, unmotivated with poor judgment and inappropriate social behavior. These symptoms suggest dysfunction of what part of the brain:
- a. Temporal lobe.
- b. Prefrontal cortex.
- c. Broca's area.
- d. Visual association area.
- e. Somatosensory association area.
- Answer: b

- A 70-year-old man with a history of hypertension went to work and had sudden onset of nausea and vomiting. He was taken to ER, where his exam was notable for slurred speech(dysarthria), dysmetria on finger-to-nose testing on the left side. His gait was normal with normal equilibrium. Where is the lesion:
- a. Cerebellar vermis.
- b. Right cerebellar hemisphere.
- c. Left cerebellar hemisphere.
- d. Fastigial nucleus.
- e. Vestibular nuclei.
- Answer: c

- Total destruction of Wernicke's area in the dominant cerebral hemisphere leads to:
- a. Inability to see.
- b. Inability to comprehend spoken and written words and formulate thoughts.
- c. Inability to speak.
- d. Inability to perform purposeful movements in spite of the absence of any muscle paralysis.
- e. Inability to hear.
- Answer: b

- Which of the following statements is not matched:
- a. Retrograde amnesia → Lesion in the thalamus.
- b. Prefrontal cortex lesion → Socially disinhibited behavior.
- c. Basal ganglia lesion → Instability to perform rapid alternating movements with the hands.
- d. Cerebellum lesion → Nystagmus and wide gate (drunken gate).
- e. Upper motor neuron lesion → Hyperreflexia, fasciculation, and fibrillation.
- Answer: C

- Sensory areas responsible for vision are in:
- a. The frontal lobe.
- b. The insula of the parietal lobe.
- c. The temporal lobe.
- d. The occipital lobe.
- e. The parietal lobe.
- Answer: d

➢ Guyton Questions

- Which brain structure serves as the major controller of the limbic system:
- a. Hypothalamus.
- b. Hippocampus.
- c. Amygdala.
- d. Mammillary body.
- e. Fornix.
- Answer: a

- The gigantocellular neurons of the reticular formation release which neurotransmitter:
- a. Norepinephrine.
- b. Serotonin.
- c. Dopamine.
- d. Acetylcholine.
- e. Glutamate.
- Answer: d

- Which body part is represented most laterally and inferiorly within the primary motor cortex:
- a. Face.
- b. Hand.
- c. Neck.
- d. Abdomen.
- e. Lower limbs.
- Answer: a

- A large portion of the cerebral cortex does not fit into the conventional definition of motor or sensory cortex. Which term refers to the type of cortex that receives input primarily from several other regions of the cerebral cortex:
- a. Cortex that is agranular.
- b. Secondary somatosensory cortex.
- c. Association cortex.
- d. Supplementary motor cortex.
- e. Secondary visual cortex.
- Answer: c

- Which projection system is contained in the superior cerebellar peduncle:
- a. pontocerebellar.
- b. Cerebellothalamic.
- c. Posterior spinocerebellar.
- d. Carticospinal.
- e. medullarycerebellar.
- Answer: b

- Which statement best describes a functional role for the intermediate zone of the cerebellum:
- a. Controls and coordinates movements of the axial muscles, as well as the shoulder and hip.
- b. Controls movements that involve distal limb musculature.
- c. Functions with the cerebral cortex to plan movements.
- d. Stimulates motor neurons through its connections to the spinal cord.
- e. none of the above.
- Answer: b

- Which statement best describes a functional role for the cerebellar vermis:
- a. Controls and coordinates movements of the axial muscles, as well as the shoulder and hip.
- b. Controls movements that involve distal limb musculature.
- c. Functions with the cerebral cortex to plan movements.
- d. Stimulates motor neurons through its connections to the spinal cord.
- e. none of the above.
- Answer: A

- Which neurotransmitter is used by the axons of locus coeruleus neurons that distribute throughout much of the brain:
- a. Norepinephrine.
- b. Dopamine.
- c. Serotonin.
- d. Acetylcholine.
- e. GABA.
- Answer: A

- Which neurotransmitter is used by the axons of substantia nigra neurons that project to the caudate and putamen:
- a. Norepinephrine
- b. dopamine
- c. Acetylchaline
- d. GABA
- e. serotonin.
- Answer: b

- A 10-year-old girl is taken to the physician because of difficulty walking. Physical examination show loss of tendon reflexes in the knee and ankles and reduced two- point discrimination in the hands and feet. Repeat visits to the physician show a progressive worsening of these symptom during the next 2 years. However, the girl is always alert and seems to have normal reasoning abilities. Her uncle had similar problems at age 12 years and later developed scoliosis followed by loss of heating and vision. Answer the question in this page and in the next page too. What is the most likely diagnosis:
- a. Frederick's ataxia.
- b. Huntington's disease.
- c. Multiple sclerosis.
- d. Parkinson's disease.
- e. Poliomyelitis.
- Answer: a

- What is the most likely cause of these symptoms in this girl:
- a. a lesion in the premotor cortex.
- b. a lesion in the primary motor cortex.
- c. Malformation of the cerebellum.
- d. Nerve degeneration.
- e. Nerve proliferation.
- Answer: d

- Which epileptic condition involves a postictal depression period lasting from several minutes to perhaps as long as several hours:
- a. Generalized tonic-clonic seizure.
- b. Absence seizure.
- c. Jacksonian seizure.
- d. Phase-out clonic seizure.
- e. Temporal lobe seizure.
- Answer: a

- In controlling the fine muscles of the hands and fingers, corticospinal axons can synapse primarily with which of the following:
- a. Posterior horn neurons.
- b. Spinal cord interneurons.
- c. Spinal cord motor neurons.
- d. Purkinje cells.
- e. Renshaw cells.
- Answer: c

- In a neurophysiology experiment conducted with monkeys, the amygdalae are surgically ablated bilaterally. Which of the following is most likely to be increased 6 months after ablation of the amygdala:
- a. Despondence.
- b. Memory.
- c. Paranoia.
- d. Sex drive.
- e. Tremors.
- Answer: d

- Which of the following foramina allows cerebrospinal fluid to pass directly from the ventricular system into the subarachnoid space:
- a. Foramen of Magendie.
- b. Aqueduct of Sylvius.
- c. Third ventricle.
- d. Lateral ventricle.
- e. Arachnoid villi.
- Answer: A

- Afferent signals from the periphery of the body travel to the cerebellum in which nerve tract:
- a. Ventral spinocerebellar.
- b. Fastigioreticular.
- c. Vestibulocerebellar.
- d. Reticulocerebellar.
- e. Dorsal spinocerebellar.
- Answer: e

- Motor cortex neurons receive feedback from muscles activated by the corticospinal system. This feedback arises from which of the following structures:
- a. Red nucleus.
- b. Spinocerebellar tracts.
- c. Skin surface of fingers used to grasp an object.
- d. Muscle spindles in muscles antagonistic to those used to make the movement.
- e. Vestibular nuclei.
- Answer: c

- Like the primary visual cortex, the primary motor cortex is organized into vertical columns composed of cells linked together throughout the six layers of the cortex. The cells that contribute axons to the corticospinal tract are concentrated in which cortical layer:
- a. Layer 1.
- b. Layer 11.
- c. Layer III.
- d. Layer IV.
- e. Layer V.
- Answer: e

- A vascular lesion that causes degeneration of corticospinal axons in the basilar pons will most likely lead to:
- a. Paralysis primarily involving muscles around the contralateral shoulder and hip joints.
- b. paralysis of the muscles of mastication.
- c. Loss of voluntary control of discrete movements of the contralateral hand and fingers.
- d. Inability to speak clearly.
- e. Inability to convert short term memory into long term memory.
- Answer: c

- Fine motor movement of the index finger can be elicited by stimulation of which brain area:
- a. Primary motor cortex.
- b. Lateral cerebellar hemisphere
- c. Premotor cortex
- d. Supplemental motor areas.
- e. red nucleus.
- Answer: a

- A 23-year-old basketball player mentally rehearses free throw shots while lying in bed. Which option best de scribes the area of the brain that is involved in generating a motor image of this action in the absence of actual movement:
- a. Basal ganglia.
- b. Cerebellum.
- c. limbic system.
- d. Premotor cortex.
- e. Primary motor cortex.
- Answer: d

- Which type of seizure is associated with a spike and dome electroencephalogram pattern during the seizure activity:
- a. generalized tonic-clonic.
- b. Temporal lobe
- c. Larkinian.
- d. absence.
- e. Apoplectic.
- Answer: d

- Which activity will increase the sensitivity of the stretch reflex:
- a. Cutting the dorsal root fibers associated with the muscle in which the stretch reflex is being examined.
- b. Increasing the activity of the medullary reticular nuclei.
- c. Bending the head forward.
- d. Enhanced activity in the fusimotor (gamma motor neuron) system.
- e. Stimulating the lateral hemispheres of the cerebellum.
- Answer: b

- Neurological disease associated with the cerebellum produces which type of symptoms:
- a. Resting tremor.
- b. Athetosis.
- c. Rigidity.
- d. Ataxia.
- e. Akinesia.
- answer: d

- A complex spike pattern in the Purkinje cells of the cerebellum can be initiated by stimulation of which brain area:
- a. Inferior olivary complex.
- b. Brain stem reticular nuclei.
- c. Neurons in red nucleus.
- d. Superior olivary complex.
- e. Dorsal vestibular nucleus.
- Answer: a

- Which structure serves as an “alternative pathway” for signals from the motor cortex to the spinal cord:
- a. Red nucleus.
- b. Basilar pontine nuclei.
- c. Caudate nucleus.
- d. Thalamus.
- e. Dorsal column nuclei.
- Answer: a

- The phenomenon of decerebrate rigidity can be explained, at least in part, by which of the following:
- a. Stimulation of type 1b sensory neurons.
- b. Loss of cerebellar inputs to the red nucleus.
- c. Overactivity of the medullary reticular nuclei involved in motor control.
- d. Unopposed activity of the pontine reticular nuclei.
- e. Degeneration of the nigrostriatal pathway.
- Answer: d

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