

6. An aphasia is most likely to be associated with a lesion of

- a. The hippocampus
- b. The temporal lobe
- c. The parietal lobe
- d. The limbic system
- e. The reticular activating system

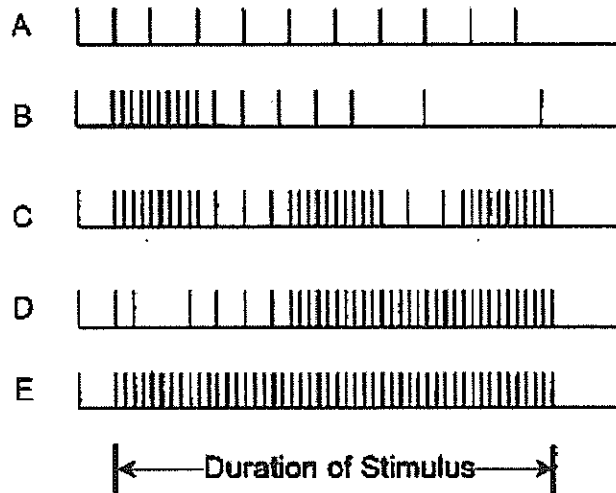
7. Depolarization of the hair cells in the cochlea is caused primarily by the flow of

- a. K^+ into the hair cell
- b. Na^+ into the hair cell
- c. Cl^- out of the hair cell
- d. Ca^{2+} into the hair cell
- e. Mg^{2+} into the hair cell

8. The most important role of the gamma motoneurons is to

- a. Stimulate skeletal muscle fibers to contract
- b. Maintain Ia afferent activity during contraction of muscle
- c. Generate activity in Ib afferent fibers
- d. Detect the length of resting skeletal muscle
- e. Prevent muscles from producing too much force

9. Each of the figures in the diagram below illustrates a train of action potentials in response to a sudden limb movement. The sensory neuron encoding the velocity of the limb movement is illustrated by which figure?



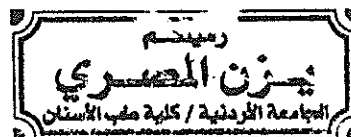
- a. A
- b. B
- c. C
- d. D
- e. E

10. Which of the following receptors is responsible for measuring the intensity of a steady pressure on the skin surface?

- a. Pacinian corpuscle
- b. Ruffini ending
- c. Merkel's disk
- d. Meissner's corpuscle
- e. Krause ending

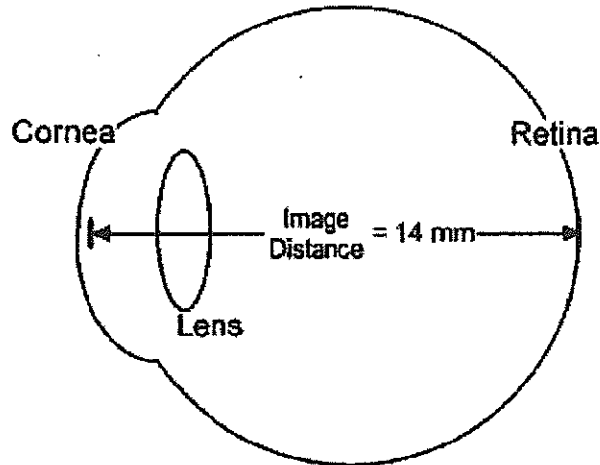
11. The middle cerebellar peduncle contains afferent fibers conveyed in which of the following tracts?
- Dorsal spinocerebellar
 - Ventral spinocerebellar
 - Tectocerebellar
 - Pontocerebellar**
 - Vestibulocerebellar
12. The precentral gyrus and corticospinal tract are essential for
- Vision
 - Olfaction
 - Auditory identification
 - Kinesthesia
 - Voluntary movement**
13. A patient who presents with an intention tremor, "past-pointing," and a "drunken" gait might be expected to have a lesion involving the
- Cerebellum**
 - Medulla
 - Cortical motor strip
 - Basal ganglia
 - Eighth cranial nerve
14. The otolith organs (utricle and saccule) are responsible for
- Producing the vestibular-ocular reflex
 - Detecting the position of the head in space**
 - Producing rotary nystagmus
 - Detecting angular acceleration
 - Producing the stretch reflex
15. Which one of the reactions in the retinal rods is caused directly by the absorption of light energy?
- Dissociation of scotopsin and metarhodopsin
 - Decomposition of scotopsin
 - Transformation of 11-cis retinal to all-trans retinal**
 - Transformation of metarhodopsin to lumirhodopsin
 - Transformation of vitamin A to retinene
16. Which of the following statements about the cerebrospinal fluid (CSF) is true?
- It is absorbed by the choroid plexus
 - Its absorption is independent of CSF pressure
 - It circulates in the epidural space
 - It has a lower glucose concentration than plasma**
 - It has a higher protein concentration than plasma
17. When a person slowly rotates toward the right,
- The stereocilia on the hair cells in the right horizontal semicircular canal bend away from the kinocilium
 - Both the left and right eyes deviate toward the left**
 - The hair cells in the left horizontal semicircular canal become depolarized
 - The visual image on the retina becomes unfocused
 - The endolymph in the left and right horizontal semicircular canals moves in opposite directions
18. During a normal voluntary movement
- Large muscle fibers are recruited before small muscle fibers
 - Fast muscle fibers are recruited before slow muscle fibers
 - Weak muscle fibers are recruited before strong muscle fibers**
 - Poorly perfused muscle fibers are recruited before richly perfused muscle fibers
 - Anaerobic fibers are recruited before aerobic fibers

19. Correct statements regarding rapid eye movement (REM) sleep include which of the following?
- It is the first state of sleep entered when a person falls asleep
 - It is accompanied by loss of skeletal muscle tone**
 - It is characterized by a slow but steady heart rate
 - It occurs more often in adults than in children.
 - It lasts longer than periods of slow-wave sleep
20. When emmetropic persons become presbyopic, their
- Visual acuity increases
 - Near point increases**
 - Far point decreases
 - Total refractive power increases
 - Ability to see distant objects decreases
21. When light strikes the eye there is an increase in
- The activity of the transducin**
 - The amount of transmitter released from the photoreceptors
 - The concentration of all-trans retinal within the photoreceptors
 - The concentration of calcium within the photoreceptors
 - The activity of guanylyl cyclase
22. Spasticity can be caused by sectioning
- The corticospinal fibers
 - The vestibulospinal fibers
 - The Ia afferent fibers
 - The corticoreticular fibers**
 - The reticulospinal fibers
23. Activation of transducin by light activates an enzyme which
- Hydrolyzes cGMP**
 - Increases the dark current
 - Activates adenylyl cyclase
 - Releases calcium from intracellular stores
 - Depolarizes the membrane
24. If nystagmus is a prominent symptom of a cerebellar lesion, the lesion is within
- The dentate nucleus
 - The flocculonodular lobe**
 - The lateral cerebellum
 - The cerebrocerebellar cortex
 - The superior cerebellar peduncle
25. The alpha rhythm appearing on an electroencephalogram has which of the following characteristics?
- It produces 20 to 30 waves per second
 - It disappears when a patient's eyes open**
 - It is replaced by slower, larger waves during REM sleep
 - It represents activity that is most pronounced in the frontal region of the brain
 - It is associated with deep sleep



Questions 26-27

The image distance of a normal relaxed eye is indicated in the diagram below.



26. The focal length of the eye is

- a. 14 mm
- b. 15 mm
- c. 17 mm
- d. 19 mm
- e. 21 mm

27. If an object is placed 25 cm away from the eye, the image will be focused on the retina if the refractive power of the eye is increased to

- a. 64 diopters
- b. 68 diopters
- c. 70 diopters
- d. 72 diopters
- e. 75 diopters

28. Tapping the patella tendon elicits a reflex contraction of the quadriceps muscle. During the contraction of the quadriceps muscle,

- a. The Ib afferents from the Golgi tendon organ increase their rate of firing
- b. The Ia afferents from the muscle spindle increase their rate of firing
- c. The alpha motoneurons innervating the extrafusal muscle fibers decrease their rate of firing
- d. The gamma motoneurons innervating the intrafusal muscle fibers increase their rate of firing
- e. The alpha motoneurons to the antagonistic muscles increase their rate of firing

29. Increased activity of the sympathetic nervous system causes

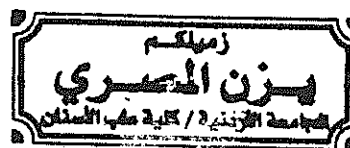
- a. Penile erection
- b. Pupillary constriction
- c. Accommodation for near vision
- d. **Bronchiolar dilation**
- e. Gallbladder emptying

30. Norepinephrine will cause contraction of the smooth muscle in the

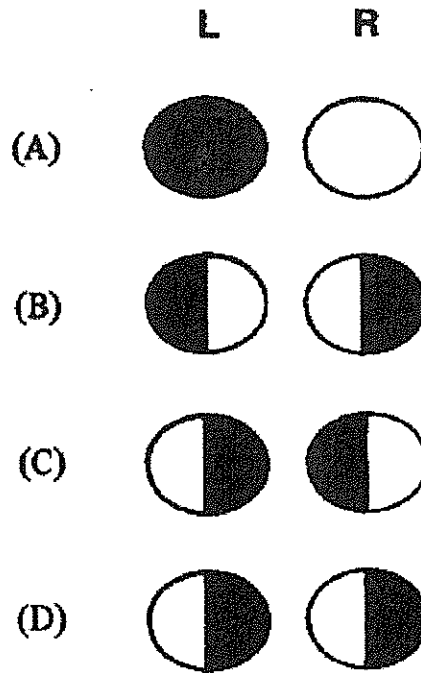
- a. Bronchioles
- b. Pupils
- c. Intestine
- d. **Arterioles**
- e. Ciliary body



31. If the threshold for hearing increases 1000 times, the hearing loss is
- 20 decibels
 - 30 decibels
 - 40 decibels
 - 50 decibels
 - 60 decibels
32. If a patient is unable to hear high-frequency sounds, the damage to the basilar membrane is closest to the
- Oval window
 - Helicotrema
 - Stria vascularis
 - Modiolus
 - Spiral ganglion
33. An abnormal Babinski reflex indicates damage to the
- Spinal cord
 - Brainstem
 - Cerebellum
 - Basal ganglia
 - Pyramids
34. Which of the following hypothalamic nuclei is responsible for controlling the normal circadian rhythm?
- Paraventricular nucleus
 - Ventromedial nucleus
 - Arcuate nucleus
 - Lateral nucleus
 - Suprachiasmatic nucleus
35. Presynaptic inhibition in the central nervous system affects the firing rate of alpha motoneurons by
- Increasing the chloride permeability of the presynaptic nerve ending
 - Decreasing the potassium permeability of the alpha motoneuron
 - Decreasing the frequency of action potentials by the presynaptic nerve ending
 - Increasing (hyperpolarizing) the membrane potential of the alpha motoneuron
 - Increasing the amount of the neurotransmitter released by the presynaptic nerve ending
36. Which one of the following events accompanies the rapid voluntary flexion of the arm?
- An increase in the activity of the Ia afferent fibers from the biceps (the agonist)
 - A decrease in the activity of the Ib afferent fibers from the biceps (the agonist)
 - An increase in the activity of the Ia afferent fibers from the triceps (the antagonist)
 - A decrease in the activity of the Ib afferent fibers from the triceps (the antagonist)
 - An increase in the activity of the alpha motoneurons to the triceps (the antagonist)
37. The sympathetic response in a "fight or flight" reaction causes a decrease in
- The arterial blood pressure
 - The diameter of the pupil
 - The resistance of the airways
 - The blood glucose concentration
 - The heart rate



38. Which one of the optic field defects listed in the following diagram is produced by a pituitary gland tumor?



- a. A
- b. B
- c. C
- d. D

39. Which one of the following visual lesions will produce extensive loss of peripheral vision in the left visual fields of both eyes?

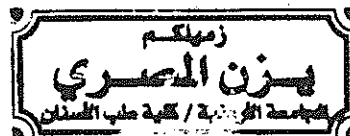
- a. A lesion of the left lateral geniculate
- b. Section of the left optic nerve
- c. A lesion of the right visual cortex
- d. Removal of the right lens
- e. Section of the left optic tract

40. The pain produced by ischemia is poorly localized and throbbing while pain from a needle stick is well localized and sharp. Which of the following comparisons of ischemic and needle stick pain is correct?

- a. Ischemic pain sensory fibers are classified as A delta (A \otimes) sensory fibers
- b. Ischemic pain is produced by overstimulating somatic touch receptors
- c. Ischemic pain is transmitted to the brain through the neospinothalamic tract
- d. Ischemic pain receptors quickly adapt to a painful stimulus
- e. Ischemic pain sensory fibers terminate within the substantia gelatinosa of the spinal cord

41. Which one of the following hypothalamic nuclei is responsible for the detection of the core body temperature?

- a. The lateral hypothalamus
- b. The arcuate nucleus
- c. The posterior nucleus
- d. The paraventricular nucleus
- e. The anterior hypothalamus

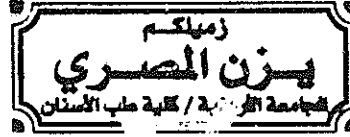


42. In which one of the following sensory systems does stimulation cause the receptor cell to hyperpolarize?

- a. Vision
- b. Hearing
- c. Taste
- d. Touch
- e. Smell

43. The Klüver-Bucy syndrome is characterized by decreased emotional expression, loss of fear, excessive oral behavior, and increase in sexual activity. These characteristics of the Klüver-Bucy syndrome are produced by bilateral lesions of the

- a. Hippocampus
- b. Amygdala.
- c. Ventral hypothalamus.
- d. Corpus callosum.
- e. Cingulate gyrus.



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