

Correct answers are in **bold, red type**.

1. Which statement about sensory receptors is TRUE?
 - a. Refraction is the maximal stimulus intensity that will still generate an action potential.
 - b. Sensory perception is the process by which graded potentials are converted into stimuli.
 - c. Sensory receptors are designed to respond equally to many kinds of stimuli.
 - d. Each type of sensory receptor has a preferred or 'adequate' stimulus.**
 - e. All sensory receptor cells are neurons with long axons.

2. All sensory pathways except olfaction project to the thalamus, which acts
 - a. as an inhibitory gate.
 - b. as a relay and processing station.**
 - c. as a supplementary association area.
 - d. as a major construction site.
 - e. as a bridge between the cerebellum and the spinal cord.

3. Phasic sensory receptors
 - a. are quick to adapt to a constant stimulus.**
 - b. slowly increase the frequency of action potentials generated in response to a constant stimulus.
 - c. cannot detect the intensity of a stimulus.
 - d. sustain action potential generation throughout the application of a steady stimulus.
 - e. are only found in the retina.

4. Which of the following sensations is not detected by the somatosensory system?
 - a. touch
 - b. cold
 - c. vibration
 - d. heat
 - e. light**

5. Sharp, localized pain is transmitted to the central nervous system along
 - a. large, myelinated A-beta fibers
 - b. small, myelinated A-delta fibers**
 - c. small, unmyelinated C fibers

6. Pain sensation can be partially suppressed by
 - a. electrical stimulation of A-delta fibers.
 - b. mechanical stimulation of A-beta fibers.**
 - c. activation of C-fibers.
 - d. heat stimulation of the A-delta fibers
 - e. heat stimulation of the A-beta fibers

7. Which of the following is a correct list of the primary gustatory (taste) sensations?
 - a. sweet, salty, bitter, sour, umami**
 - b. spicy, salty, bitter, sour, umami
 - c. sweet, salty, floral, sour, umami
 - d. hot, salty, bitter, dry, umami
 - e. sweet, salty, bitter, sour, crunchy

8. The depolarization of olfactory sensory neurons depends on
 - a. increases in ATP release.
 - b. the extrusion of potassium ions.
 - c. the extrusion of sodium ions.
 - d. increases in adenylyl cyclase activity and cAMP concentrations.**
 - e. the activation of voltage-gated channels.

9. The relative motion of the tectorial and basilar membranes leads to the activation of ion channels on the _____ in the cochlea.
 - a. sarcoplasmic reticulum membrane
 - b. tympanic membrane
 - c. helicotrema membrane
 - d. utricular membrane
 - e. stereocilia of hair cells**

10. High frequency sounds are detected by
 - a. unique hair cells tuned to high frequencies.
 - b. the middle of the basilar membrane.
 - c. hair cells located near the oval window end of the basilar membrane.**
 - d. hair cells located near the helicotrema end of the basilar membrane.
 - e. the vibration of the tympanic window.

11. Which sense organs detect tilting of the head?
- the cochlea and entorhinal organ
 - the Pacinian and the Meissner's corpuscles
 - the baroreceptors and chemoreceptors
 - the utricles and saccules**
 - the basilar and tectorial membranes

NOTE: The kinocilium is the long stereocilium located at one side of the bundle of stereocilia in a vestibular hair cell.

12. The release of neurotransmitter from a vestibular hair cell at its synapse with a primary vestibular sensory neuron decreases
- in response to any mechanical stimulation of the hair cell.
 - when the stereocilia of the hair cell are displaced away from the kinocilium.**
 - when the stereocilia are equally displaced to either side of the kinocilium.
 - when the stereocilia of the hair cell are displaced toward the kinocilium.
 - when the stereocilia and kinocilium of a hair cell are displaced in opposite directions.

13. Compensatory eye movements in response to rapid head movements are generated automatically by the
- flexion reflex
 - vestibulo-ocular reflex**
 - pupillary light reflex
 - the clasp-knife reflex
 - visual cortex

14. Accommodation by changing the shape of the lens aids in
- night vision.
 - repairing corneal damage.
 - changing the size of visual receptive fields.
 - focusing light on the retina.**
 - eliminating the 'blind spot'.

15. The region of the retina that contains only cones and is the site of sharpest vision acuity is called
- the sighted spot
 - the rod zone
 - the fovea**
 - the optic disc
 - the tapetum lucidum.

16. The exit point of the optic nerve from the retina creates
- a. amblyopia.
 - b. strabismus.
 - c. a blind spot in the visual field.**
 - d. the macula.
 - e. nearsightedness.
17. Which of the following events occurs in photoreceptors during phototransduction?
- a. Membrane cyclic nucleotide-gated (CNG) channels close
 - b. cGMP concentration is decreased
 - c. The membrane hyperpolarizes
 - d. Transducin is activated
 - e. ALL of the above occur**
18. During the execution of most voluntary movements, flexor and extensor muscles are activated
- a. at the same time.
 - b. alternately.**
 - c. by lengthening the tendons.
 - d. by relaxation of the tendons.
 - e. by cAMP.
19. The transverse or T-tubules in muscle fibers are designed to
- a. propagate action potentials into the interior of the cell.**
 - b. regulate the action of troponin.
 - c. align the actin and myosin filaments.
 - d. produce ATP in the mitochondria.
 - e. extend the range of the motor endplate
20. The formation of crossbridges between the heads of myosin molecules and actin filaments
- a. terminates muscle contraction.
 - b. is inhibited by calcium release.
 - c. is the essential mechanism generating muscle contraction.**
 - d. causes the actin molecule to shorten during the power stroke.
 - e. causes the actin molecule to lengthen during the power stroke.

21. The latent period is the time between the arrival of the action potential in the muscle and the beginning of _____.
- the refractory period.
 - the relaxation phase.
 - the repolarization phase.
 - muscle contraction.**
 - the inactivation phase.
22. Which of the following is not considered part of a motor unit?
- the oligodendrocytes**
 - the cell body of the motor neuron
 - all of the muscle fibers that the motoneuron innervates
 - the axon of the motor neuron
 - the neuromuscular junctions
23. Regardless of the type of movement performed or its speed, motor units are always recruited
- from largest to smallest.
 - in a random sequence.
 - in order of decreasing axonal conduction velocity.
 - in order of decreasing size.
 - in the same order.**
24. A cerebral stroke localized to one cortical hemisphere normally leads to motor deficits
- on the same side of the body.
 - only in the legs.
 - on the opposite side of the body.**
 - in the hands and feet only.
 - that are completely resolved within a few minutes.
25. At the synapses between postganglionic neurons and their target tissues, the parasympathetic branch of the autonomic nervous system releases
- norepinephrine.
 - glutamate.
 - sodium.
 - calcium.
 - acetylcholine.**

26. Which of the following responses is NOT a consequence of the activation of sympathetic autonomic neurons?
- pupil dilation
 - inhibition of insulin secretion
 - increased heart rate
 - fat breakdown
 - decreased heart rate**
27. Pharmacologic agents that block adrenergic receptors exert their most potent effects at the target tissues of _____ neurons.
- parasympathetic postganglionic
 - sensory
 - sympathetic postganglionic**
 - olfactory
 - cholinergic
28. Which of the following functions is not associated with the hypothalamus?
- maintenance of body temperature
 - control of ECF osmolarity
 - control of food intake
 - control of reproductive functions
 - control of skeletal muscle**
29. Which normal phase of human sleep is most like the “awake state”?
- slow-wave sleep
 - deep sleep
 - non-REM sleep
 - REM sleep**
 - stage 2-3 transitions
30. Lesions in the left cerebral hemisphere often result in profound deficits in
- control of muscles on the left side of the body and hearing.
 - control of muscles on the right side of the body and speech production.**
 - control of muscles on the left side of the body and visual acuity.
 - olfaction and gustation.
 - respiration and heart rate control.