

A&P I Exam 3

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) In muscle contraction, calcium apparently acts to:
 - A) release the inhibition on Z discs.
 - B) remove the blocking action of tropomyosin.
 - C) cause ATP to bind to actin.
 - D) increase the action potential transmitted along the sarcolemma.

- 2) Calcium ions bind to the _____ molecule in skeletal muscle cells.
 - A) actin
 - B) tropomyosin
 - C) myosin
 - D) troponin

- 3) An elaborate network of membranes in skeletal muscle cells that functions in calcium storage is the:
 - A) intermediate filament network.
 - B) myofibrillar network.
 - C) sarcoplasmic reticulum.
 - D) mitochondria.

- 4) A sarcomere is:
 - A) the area between two Z discs.
 - B) found in smooth muscle only
 - C) the area between two intercalated discs.
 - D) the wavy lines on the cell seen in the microscope.

- 5) Immediately following the arrival of the stimulus at a skeletal muscle cell there is a short period called the _____ period during which the events of excitation-contraction coupling occur.
 - A) latent
 - B) relaxation
 - C) contraction
 - D) refractory

- 6) Creatine phosphate functions in the muscle cell by:
 - A) inducing a conformational change in the myofilaments.
 - B) forming a chemical compound with actin.
 - C) forming a temporary chemical compound with myosin.
 - D) storing energy that will be transferred to ADP to resynthesize ATP as needed.

- 7) The major function of the sarcoplasmic reticulum in muscle contraction is to:
 - A) regulate intracellular calcium concentration.
 - B) provide a source of myosin for the contraction process.
 - C) synthesize actin and myosin myofilaments.
 - D) make and store phosphocreatine.

- 8) The striations of a skeletal muscle cell are produced, for the most part, by:
 - A) the sarcoplasmic reticulum.

- B) a difference in the thickness of the sarcolemma.
- C) the arrangement of myofilaments.
- D) the T tubules.

9) Which of the following are composed of myosin?

- A) all myofilaments
- B) Z discs
- C) thick filaments
- D) thin filaments

10) During muscle contraction, myosin cross bridges attach to which active sites?

- A) thick filaments
- B) actin filaments
- C) Z discs
- D) myosin filaments

11) Which of the following surrounds the individual muscle cell?

- A) endomysium
- B) epimysium
- C) perimysium
- D) fascicle

12) The oxygen-binding protein found in muscle cells is:

- A) myoglobin.
- B) hemoglobin.
- C) immunoglobulin.
- D) ATP.

13) One functional unit of a skeletal muscle is:

- A) a myofilament.
- B) the sarcoplasmic reticulum.
- C) a myofibril.
- D) a sarcomere.

14) The functional role of the T tubules is to:

- A) enhance cellular communication during muscle contraction.
- B) hold cross bridges in place in a resting muscle.
- C) stabilize the G and F actin.
- D) synthesize ATP to provide energy for muscle contraction.

15) The role of calcium ions in muscle contraction is to:

- A) initiate the conversion of carbon dioxide to oxygen for storage.
- B) act as a third messenger.
- C) reestablish glycogen stores.
- D) bind to regulatory sites on troponin, changing their shape.

16) Athletes sometimes complain of oxygen debt, a condition that results when insufficient oxygen is available to completely break down pyruvic acid. As a result, the pyruvic acid is converted to:

- A) hydrochloric acid.
- B) lactic acid.

- C) stearic acid.
- D) a strong base.

- 17) In an isotonic contraction, the muscle:
- A) rapidly resynthesizes creatine phosphate and ATP.
 - B) does not change in length but increases tension.
 - C) never converts pyruvate to lactate.
 - D) changes in length and moves the "load."

- 18) The muscle cell membrane is called a(n):
- A) endomysium.
 - B) sarcolemma.
 - C) epimysium.
 - D) perimysium.

- 19) The sliding filament model of contraction involves:
- A) the Z discs sliding over the myofilaments.
 - B) the shortening of thick filaments so that thin filaments slide past.
 - C) actin and myosin sliding past each other but not shortening.
 - D) actin and myosin shortening but not sliding past each other.

- 20) The first thing that stops a contraction after the nerve stops sending ACh is:
- A) the action potential stops going down the T tubule.
 - B) calcium ions return to the terminal cisternae.
 - C) acetylcholinesterase destroys the ACh, and they are removed from the membrane receptors.
 - D) the tropomyosin blocks the myosin.

- 21) Ciliated CNS neuroglia that play an active role in moving the cerebrospinal fluid are:
- A) Schwann cells.
 - B) ependymal cells.
 - C) oligodendrocytes.
 - D) astrocytes.

- 22) Bipolar neurons are commonly:
- A) motor neurons.
 - B) found in ganglia.
 - C) found in the retina of the eye.
 - D) called neuroglia.

- 23) An excitatory neurotransmitter secreted by motor neurons innervating skeletal muscle is:
- A) norepinephrine.
 - B) acetylcholine.
 - C) gamma aminobutyric acid.
 - D) cholinesterase.

- 24) A neural circuit in which a single impulse is transmitted over and over is a:
- A) reverberating circuit.
 - B) repetitive circuit.
 - C) converging circuit.
 - D) diverging circuit.

- 25) A neuronal circuit that concentrates or directs a large number of incoming impulses to a rather small number of neurons is called a(n):
- A) diverging circuit.
 - B) parallel circuit.
 - C) oscillating circuit.
 - D) converging circuit.
- 26) Which of the following is not a structural feature of a neuron?
- A) Nissl bodies
 - B) synaptic cleft
 - C) axon
 - D) dendrites
- 27) The part of a neuron that conducts impulses away from its cell body is called a(n):
- A) Schwann cell.
 - B) dendrite.
 - C) axon.
 - D) neurolemma.
- 28) The point at which an impulse from one nerve cell is communicated to another nerve cell is the:
- A) receptor.
 - B) synapse.
 - C) cell body.
 - D) effector.
- 29) The role of acetylcholinesterase is to:
- A) amplify or enhance the effect of ACh.
 - B) stimulate the production of serotonin.
 - C) destroy ACh a brief period after its release by the axonal endings.
 - D) act as a transmitting agent.
- 30) The term *central nervous system* refers to the:
- A) spinal and peripheral nerves.
 - B) brain, spinal cord, and peripheral nerves.
 - C) spinal cord and spinal nerves.
 - D) brain and spinal cord.
- 31) The substance released at axonal endings to propagate a nervous impulse is called a(n):
- A) ion.
 - B) biogenic amine.
 - C) cholinesterase.
 - D) neurotransmitter.
- 32) A neuron that has as its primary function the job of connecting other neurons is called a(n):
- A) efferent neuron.
 - B) glial cell.
 - C) afferent neuron.
 - D) association neuron.
- 33) Saltatory conduction is made possible by:

- A) the myelin sheath.
 - B) erratic transmission of nerve impulses.
 - C) diphasic impulses.
 - D) large nerve fibers.
- 34) Which of these ions is actively transported through the cell membrane to establish a resting potential?
- A) Mg
 - B) Na
 - C) Cl
 - D) Ca
- 35) Schwann cells are functionally similar to:
- A) oligodendrocytes.
 - B) astrocytes.
 - C) ependymal cells.
 - D) microglia.
- 36) Immediately after an action potential has peaked, which cellular gates open?
- A) chloride
 - B) calcium
 - C) sodium
 - D) potassium
- 37) An inhibitory postsynaptic potential (IPSP) is associated with:
- A) lowering the threshold for an action potential to occur.
 - B) opening of voltage-gated channels.
 - C) a change in sodium ion permeability.
 - D) hyperpolarization.
- 38) Which of the following will occur when an excitatory postsynaptic potential (EPSP) is being generated on the dendritic membrane?
- A) A single type of channel will open, permitting simultaneous flow of sodium and potassium.
 - B) Sodium gates will open first, then close as potassium gates open.
 - C) Specific sodium gates will open.
 - D) Specific potassium gates will open.
- 39) All of the following are true of graded potentials except that they:
- A) can form on receptor endings.
 - B) increase amplitude as they move away from the stimulus point.
 - C) are short-lived.
 - D) can be called postsynaptic potentials.
- 40) In what way does the interior surface of a cell membrane of a resting (nonconducting) neuron differ from the external environment? The interior is:
- A) negatively charged and contains more sodium.
 - B) positively charged and contains less sodium.
 - C) positively charged and contains more sodium.
 - D) negatively charged and contains less sodium.
- 41) The arbor vitae refers to:
- A) cerebellar white matter.

- B) the pleatlike convolutions of the cerebellum.
- C) cerebellar gray matter.
- D) flocculonodular nodes.

42) The brain stem consists of the:

- A) pons, medulla, cerebellum, and midbrain.
- B) midbrain only.
- C) midbrain, medulla, and pons.
- D) cerebrum, pons, midbrain, and medulla.

43) The spinal cord has gray matter on the:

- A) inside, white matter on the outside, and a dorsal motor root.
- B) outside, white matter on the inside, and a ventral motor root.
- C) outside, white matter on the inside, and a dorsal motor root.
- D) inside, white matter on the outside, and a ventral motor root.

44) The subarachnoid space lies between what two layers of meninges?

- A) arachnoid and pia
- B) arachnoid and dura
- C) dura and epidura
- D) arachnoid and epidura

45) The vital centers for the control of heart rate, respiration, and blood pressure are located in the:

- A) pons.
- B) cerebrum.
- C) midbrain.
- D) medulla.

46) Cell bodies of the sensory neurons of the spinal nerves are located in:

- A) the ventral root ganglia of the spinal cord.
- B) the thalamus.
- C) the dorsal root ganglia of the spinal cord.
- D) sympathetic ganglia.

47) The fissure separating the cerebral hemispheres is the:

- A) parieto-occipital fissure.
- B) lateral fissure.
- C) longitudinal fissure.
- D) central fissure.

48) The rough, thick, leathery meningeal layer is the:

- A) subarachnoid.
- B) arachnoid.
- C) pia mater.
- D) dura mater.

49) The cerebrospinal fluid:

- A) is secreted by the arachnoid villi.
- B) is formed mostly by the choroid plexuses.
- C) is secreted mostly by the ependymal cells lining the brain ventricles.
- D) enters the four ventricles after filling and circulating through the subarachnoid space.

- 50) Which of these would you not find in the cerebral cortex?
- A) cell bodies
 - B) dendrites
 - C) fiber tracts
 - D) unmyelinated axons
- 51) Ridges of tissue on the surface of the cerebral hemispheres are called:
- A) ganglia.
 - B) sulci.
 - C) fissures.
 - D) gyri.
- 52) The function of commissures is to connect:
- A) areas of cortex with lower centers.
 - B) corresponding areas of the two hemispheres.
 - C) adjacent areas of gray matter within a cerebral hemisphere.
 - D) pyramidal cells with corresponding cerebellar cells.
- 53) The process of linking new facts with old facts already stored in the memory bank is called:
- A) rehearsal.
 - B) long-term memory.
 - C) consolidation.
 - D) automatic memory.
- 54) Which of the following would you not find in normal cerebrospinal fluid?
- A) red blood cells
 - B) potassium
 - C) protein
 - D) glucose
- 55) Storing information in long-term memory:
- A) usually proceeds from information in the short term memory.
 - B) is interfered with by emotional arousal.
 - C) depends on the remaining capacity of long-term memory.
 - D) is always dependent on the formation of conscious impressions.
- 56) Which statement is true of short-term memory?
- A) It lasts from a few seconds to a few hours.
 - B) It has a capacity of 15-20 chunks of information.
 - C) Its contents are generally permanent.
 - D) It lasts from a few hours to a few weeks.
- 57) Fact memory:
- A) is the ability to learn specific information.
 - B) is best remembered in the doing.
 - C) usually involves motor skills.
 - D) is hard to unlearn when learned once.

58) White matter (myelinated fibers) is found in all of the following locations, with the exception of the:

- A) corticospinal tracts.
- B) cerebral cortex.
- C) outer surface of the spinal cord.
- D) corpus callosum.

59) _____ waves are not normal for adults but are common for children.

- A) Beta
- B) Alpha
- C) Delta
- D) Theta

60) Spinocerebellar tracts:

- A) extend from the spinal cord into the cerebellum.
- B) terminate in the spinal cord.
- C) are found in the dorsal columns of the spinal cord.
- D) give rise to conscious experience of perception.