

Please answer all questions on the answer sheet provided

Use only the designated letter for your answer; do not write the text as your answer.

In all cases, choose the selection which best serves as the answer; when in doubt, ask!

- In anatomic position, the dorsum of the hand is
 - anterior
 - posterior
 - superior
 - inferior
- In anatomic position, the relation of pedal digit III to pedal digit II is
 - proximal
 - distal
 - medial
 - lateral
 - median
- While the testis would be considered an organ of the reproductive system, the interstitial cells of Leydig produce testosterone, and so would belong to the
 - cardiovascular system
 - digestive system
 - urinary system
 - musculoskeletal system
 - endocrine system
- The interpubic j (the joint anteriorly between the two pubic bones) is what type of articulation?
 - synostosis
 - syndesmosis
 - synchondrosis [proper]
 - symphysis
 - synovial
- If a cell is in a solution which would cause the cell to shrink, the concentration of the solution is _____ the concentration inside the cell.
 - greater than
 - less than
 - equal to
- Acids are
 - proton acceptors
 - catalysts
 - hydrogen ions
 - proton donors
- A replacement of a cartilaginous "model" of a bone is seen in
 - periosteal ossification
 - articular ossification
 - intramembranous ossification
 - endochondral ossification
- The cartilaginous plates between the diaphysis and epiphysis are the
 - nuchal lines
 - epiphyseal growth plates
 - periosteal
 - medullary spaces
- If the concentration of sodium ions is 142 mEq outside the cell and 10 mEq inside, the *diffusional gradient* (chemical gradient) would favor the movement of sodium
 - from outside to inside
 - from inside to outside
 - in neither direction
- Calcium ions bind to the _____ molecule in skeletal muscle cells.
 - actin
 - tropomyosin
 - troponin
 - myosin
- A sarcomere is the
 - nonfunctional unit of smooth muscle.
 - area between two Z lines (or Z discs).
 - area between two intercalated discs.
 - cross-striation seen under the light microscope.
- The major function of the sarcoplasmic reticulum during muscle contraction is to
 - make and store phosphocreatine.
 - synthesize actin and myosin myofilaments.
 - provide a source of myosin for the contraction process.
 - regulate intracellular calcium concentration.
- Athletes sometimes complain of oxygen debt, a condition that results when insufficient oxygen is available to break down pyruvic acid completely. As a result, the pyruvic acid is converted to
 - a strong base.
 - stearic acid.
 - hydrochloric acid.
 - lactic acid.
- A muscle that provides the major force for producing a specific movement is called a(n)
 - synergist
 - agonist
 - antagonist
 - fixator

15. The elaborate network of membranes in skeletal and cardiac muscle that functions in calcium storage is the
 - a. sarcoplasmic reticulum
 - b. mitochondrion
 - c. intermediate filament network
 - d. myofibrillar network
16. After nerve stimulation of the muscle fiber has ceased, the calcium
 - a. is destroyed by cholinesterase
 - b. is chemically bound to the filaments
 - c. levels in the sarcoplasm drop
 - d. is actively pumped into the extracellular fluid for storage until the next contraction
17. Fast oxidative fibers contain
 - a. very little myoglobin
 - b. more mitochondria than fast glycolytic fibers
 - c. enough ATP to sustain rapid contractions for five minutes
18. The class III lever system is the commonest in the body. Which of these is a class III lever system?
 - a. triceps brachii m—elbow j—forearm
 - b. metatarsophalangeal j—leg—gastrocnemius m
 - c. forearm—biceps brachii m—elbow j
19. A large motor unit
 - a. has multiple axons
 - b. exhibits very delicate muscle control
 - c. is found in the quadriceps m of the thigh
20. Rigor mortis occurs because
 - a. the sarcoplasmic reticulum pumps the ATP out of the sarcoplasm
 - b. sodium ions leak out of the myofibril
 - c. ATP is required to release the cross-bridge assembly
 - d. proteins are beginning to break down (decay), thus preventing a flow of calcium ions
21. The T tubules
 - a. stabilize G- and F-actin
 - b. transmit sarcolemmal depolarization to the interior of the fiber
 - c. hold cross-bridges in place in a resting muscle
 - d. synthesize ATP to provide energy for muscle contraction
22. In muscle contraction, calcium ions
 - a. act as tertiary messengers
 - b. reestablish glycogen stores
 - c. bind to regulatory sites on troponin, changing the molecule's configuration
 - d. initiate the conversion of carbon dioxide to oxygen for storage
23. In a concentric (isotonic) contraction, the muscle
 - a. changes in length and moves the “load”
 - b. does not change in length but increases tension
 - c. never converts pyruvate to lactate
 - d. rapidly resynthesizes creatine phosphate and ATP
24. ATPase activity is found where?
 - a. troponin
 - b. myosin head
 - c. G-actin binding site
 - d. tropomyosin
25. The connective tissue investment about each fascicle of a gross muscle is the
 - a. endomysium
 - b. perimysium
 - c. epimysium
26. The thin filaments are attached to the
 - a. H zone
 - b. thick filaments via their troponin molecules
 - c. Z-line
27. What is the commonest neurotransmitter used to excite the muscle fiber?
 - a. dopamine
 - b. GABA
 - c. acetylcholine
 - d. norepinephrine
28. Where does the nerve innervating the skeletal muscle fiber have its terminus?
 - a. closest to the origin of the muscle
 - b. in the middle of the fiber
 - c. closest to the insertion of the muscle
 - d. wherever seemed best at the time
29. Direct-acting neurotransmitters
 - a. require cAMP
 - b. mediate very slow responses
 - c. open ion channels to provoke rapid responses
 - d. act through second messengers
30. The role of acetylcholinesterase is to
 - a. act as a transmitting agent
 - b. amplify or enhance the effect of ACh
 - c. destroy ACh a brief period of time after its release by the axonal endings
 - d. stimulate the production of serotonin
31. The substance released at axonal endings to propagate a nervous impulse is
 - a. an ion
 - b. a neurotransmitter
 - c. cholinesterase
 - d. an abiogenic amine

32. A neuron that has as its primary function the job of connecting other neurons is
- an afferent neuron
 - an efferent neuron
 - an association neuron
 - a glial cell
33. The sodium-potassium pump pumps _____ sodium ions _____ the cell and _____ potassium ions _____.
- three | outside | two | inside
 - two | outside | three | inside
 - three | inside | two | outside
 - two | inside | three | outside
34. An action potential
- is essential for impulse propagation
 - involves the influx of negative ions to depolarize the membrane
 - is initiated by potassium ion movement
 - involves impulse propagation dependent on chemically gated ion channels
35. Select the correct statement about synapses.
- Cells with interconnected cytoplasm are chemically coupled.
 - The release of neurotransmitter molecules gives cells the property of being electrically coupled.
 - Neurotransmitter receptors are located on the axons of cells.
 - The synaptic cleft prevents an impulse from being transmitted directly from one neuron to another.
36. If the concentration of sodium ions is 142 mEq outside the cell and 10 mEq inside, the *diffusional gradient* (chemical gradient) would favor the movement of sodium
- from outside to inside
 - from inside to outside
 - in neither direction
37. The period after an initial stimulus when a neuron is not sensitive to another stimulus is the
- resting period.
 - repolarization.
 - depolarization.
 - refractory period.
38. Saltatory conduction is made possible by
- the myelin sheath.
 - large nerve fibers.
 - diphasic impulses.
 - erratic transmission of nerve impulses.
39. All the following are true about graded potentials except that they
- are short-lived.
 - can form on receptor endings.
 - increase amplitude as they move away from the stimulus point.
 - can be called postsynaptic potentials.
40. Which of these cells forms myelin sheaths within the central nervous system?
- perikarya
 - the epineurium
 - oligodendrocytes
 - ependymal cells
41. The voltage-gated potassium channel has how many gates?
- one
 - two
 - three
42. An action potential generated in a membrane will, if possible,
- propagate in both directions
 - diminish in intensity gradually
 - stay localized to the point of stimulation
43. Which ions are moving into and out of the cell during depolarization? [NB: In a question like this, assume that you are being asked about movement greater than the normal leakage that would occur. After all, in its resting state, a membrane is not totally refractory to ion movements in and out. Also, discount any effects of the sodium-potassium pump.]
- sodium
 - potassium
 - both of these
 - none
44. Which of these values would represent reverse polarization, given a resting membrane potential of -85 mV?
- 55 mV
 - +35 mV
 - 90 mV
45. Our reduced view of the Nernst equation states that
- $$EMF = \pm 60 \log_{10} C_1/C_2$$
- If $C_1=200$ mEq, and the ion is positive, and $C_2=20$ mEq, what is the potential difference across the membrane? [$\log_{10}100=2$, $\log_{10}1000=3$...]
- + 60 mV
 - 60 mV
 - + 600 mV
 - 600 mV

46. An inhibitory postsynaptic potential (IPSP) is associated with
- a change in sodium ion permeability
 - hyperpolarization
 - opening of voltage-gated channels
47. The nuclei for cranial nerves V, VI, and VII are found in the
- diencephalon
 - midbrain
 - pons
 - medulla
48. The brainstem includes the
- cerebral hemispheres, midbrain, pons, and medulla
 - midbrain, pons, and medulla
 - diencephalon, pons, cerebellum, and medulla
 - midbrain alone
49. The subarachnoid space lies between which two layers of the meninges?
- arachnoid and epidura
 - arachnoid and pia
 - arachnoid and dura
 - dura and epidura
50. The vital centers for the control of heart rate, respiration, and blood pressure are found in the
- pons
 - medulla
 - diencephalon
 - midbrain
51. The outermost meninx is the
- dura mater
 - arachnoid
 - pia mater
52. If the posterior part of the neural tube were to fail to close properly,
- spinal bifida might result
 - cranial nerves would fail to form
 - there would be no hindbrain
53. The connecting channel between the third and fourth ventricles is the
- foramen of Magendie
 - sinus of Valsalva
 - cerebral aqueduct
 - hypophyseal infundibulum
54. The fourth ventricle of the brain lies dorsal to the
- thalamus
 - corpus callosum
 - pons and medulla
 - pituitary infundibulum
55. Which of these is not a midbrain structure?
- third ventricle
 - cerebral peduncles
 - corpora quadrigemina
 - red nucleus
56. Which of these is not a hindbrain structure?
- fourth ventricle
 - pons
 - medulla
 - basal nuclei
57. The brain area that regulates activities that control the state of wakefulness or alertness of the cerebral cortex is the
- thalamus
 - reticular formation
 - pyramids
 - limbic system
58. The functions of the vestibulocochlear nerves include
- vision and hearing
 - smell and taste
 - hearing and balance
 - fine and gross muscle control

Name: _____

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1. b _____
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34. a _____
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36. **a** _____
37. d _____
38. a _____
39. c _____
40. c _____
41. a _____
42. a _____
43. c _____
44. b _____
45. b _____
46. b _____
47. c _____
48. b _____
49. b _____
50. b _____
51. a _____
52. a _____
53. c _____
54. c _____
55. a _____
56. d _____
57. b _____
58. c _____