1. Which transport process allows for the movement of solid particles across the plasma membrane from the cell interior to the cell exterior?
   a) Exocytosis
   b) osmosis
   c) primary active transport
   d) endocytosis
   e) facilitated diffusion

2. During muscle contraction, myosin cross bridges attach to which active sites?
   a) myosin filaments
   b) actin filaments
   c) Z discs
   d) thick filaments

3. _____ epithelium appears to have two or three layers of cells, but all the cells are in contact with the basement membrane.
   a) Stratified cuboidal
   b) Stratified columnar
   c) Transitional
   d) Pseudostratified columnar

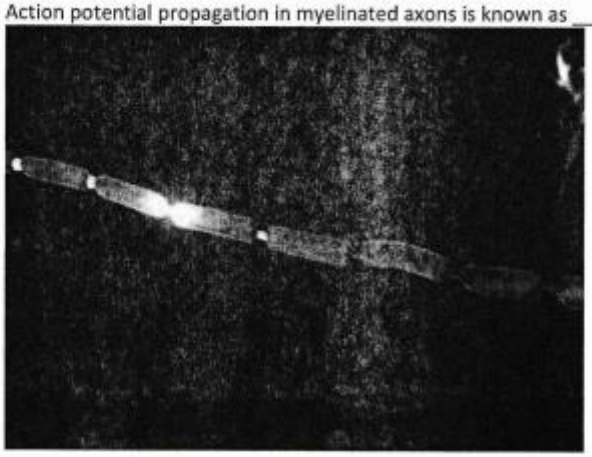
4. The stiffness of muscle tissue in rigor mortis partially results from:
   a) excessive acetycholine activity on muscle
   b) excessive ATP build up in muscle
   c) excessive lactic acid build up
   d) excessive contraction of the fibers

5. Myelin sheaths in the CNS are produced by the _____.
   a) astrocytes
   b) microglia
   c) oligodendrocytes
   d) Schwann cells

6. What is the role of tropomyosin in skeletal muscles?
   a) Tropomyosin is the chemical that activates the myosin heads.
   b) Tropomyosin serves as a contraction inhibitor by blocking the myosin binding sites on the actin molecules
   c) Tropomyosin serves as a contraction inhibitor by blocking the actin binding sites on the myosin molecules.
   d) Tropomyosin is the receptor for the motor neuron neurotransmitter.

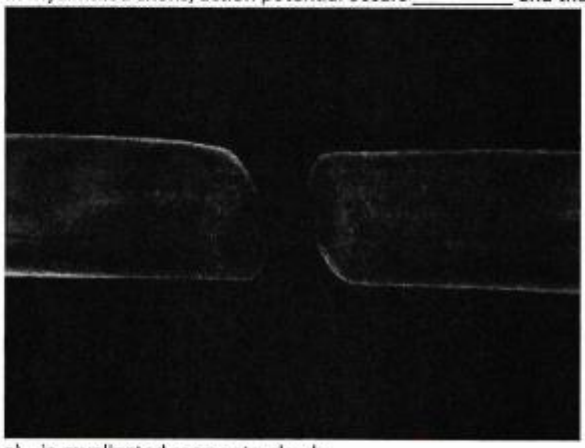
7. A motor unit is made up of _____.
   a) all the muscle fibers within a given muscle
   b) a motor neuron and the muscle fibers it innervates
   c) all the neurons going into an individual section of the body
   d) a fascicle and a nerve

8. Action potential propagation in myelinated axons is known as _____.



a) continuous conduction
b) gradual conduction
c) constant conduction
d) spontaneous conduction
e) salutatory conduction

9. In myelinated axons, action potential occurs _____ and they propagate _____.



a) in myelinated segments; slowly
b) in myelinated segments; rapidly
c) at nodes of Ranvier; slowly
d) at nodes of Ranvier; rapidly
e) in myelinated and unmyelinated segments; rapidly

10. Place the following in correct sequence from simplest to most complex:
    1. molecules
    2. atoms
    3. tissues
    4. cells
    5. organs

    2-1-4-3-5

    a) 1-2-3-4-5
    b) 2-1-4-3-5
    c) 2-1-3-4-5
    d) 1-2-4-3-5

11. The influx of sodium ions in one segment of an unmyelinated axon initiates which of the following events?
    a) an action potential in that segment
    b) a depolarizing current that brings the adjacent segment to threshold
    c) a repolarizing current that brings the adjacent segment to threshold
    d) all of the above
    e) a and b

12. Generation of an action potential can be inhibited by all of the following except: _____.
    a) IPSPs
    b) presynaptic inhibition
    c) depolarization
    d) hyperpolarization

13. In areas of the body subject to a higher degree of mechanical stress, which of the following types of membrane junctions would you expect to be most prevalent?
    a) Desmosomes
    b) Microvilli
    c) Tight junctions
    d) Gap junctions

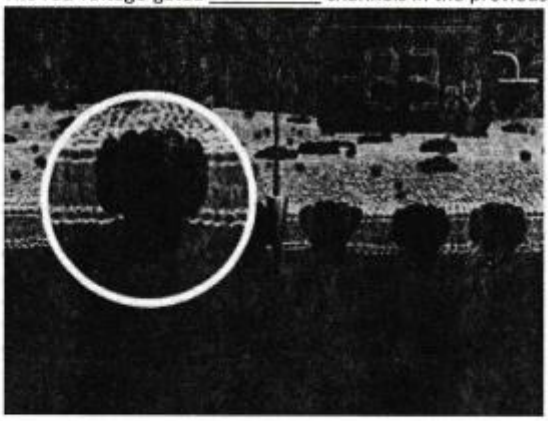
14. The sliding filament model of contraction involves _____.
    a) actin and myosin sliding past each other and partially overlapping
    b) the shortening of thick filaments so that thin filaments slide past
    c) actin and myosin lengthening in order to slide past each other
    d) the Z discs sliding over the myofilaments

15. A threshold stimulus immediately _____.
    a) opens voltage-gated potassium channels
    b) opens voltage-gated sodium channels
    c) inactivates voltage-gated sodium channels
    d) closes voltage-gated sodium channels
    e) closes voltage-gated potassium channels

16. What is a vertical section through the body, dividing it into left and right, called?
    a) frontal
    b) regional
    c) sagittal
    d) transverse

17. What are the three main components of connective tissue?
    a) ground substance, fibers, and cells
    b) alveoli, fibrous capsule, and secretory cells
    c) collagen, elastin, and reticular fibers
    d) fibroblasts, chondroblasts, and osteoblasts

18. The red voltage-gated _____ channels in the previous slide are _____.



    a) sodium; open
    b) potassium; open
    c) sodium; inactivated
    d) potassium; closed
    e) potassium; inactivated

19. When a molecule is transported via facilitated diffusion _____.
    a) transport increases linearly with the concentration gradient
    b) there is no transport maximum
    c) there is a transport maximum because transport proteins are required
    d) it moves directly through the phospholipid bilayer
    e) an input of energy is required

20. What structure in skeletal muscle cells functions in calcium storage?
    a) sarcoplasmic reticulum
    b) mitochondria
    c) intermediate filament network
    d) myofibrillar network

21. Which description of muscle contraction means that all of the fibers within a muscle are fully contracted?
    a) all-or-none law
    b) summation
    c) tetanic
    d) muscle twitching

22. Immediately following the arrival of the stimulus at a skeletal muscle cell there is a short period called the _____ period during which the neurotransmitter is released by exocytosis, diffuses across the synaptic cleft, and binds to its receptors.
    a) contraction
    b) relaxation
    c) latent
    d) refractory

23. Mitochondria _____.
    a) are always the same shape
    b) are single-membrane structures involved in the breakdown of ATP
    c) contain some of the DNA and RNA code necessary for their own function
    d) synthesize proteins for use outside the cell

24. Which of the following is NOT a function of lysosomes?
    a) digesting particles taken in by endocytosis
    b) degrading worn-out or nonfunctional organelles
    c) forming acid hydrolases which are necessary to help form cell membranes
    d) breaking down bone to release calcium ions into the blood

25. The resting membrane potential depends on each item below *except*:
    a) the concentration gradient for sodium ions
    b) the greater permeability of the plasma membrane to potassium ions
    c) the greater permeability of the membrane to anions rather than cations
    d) the greater number of potassium leak channels

26. The type of muscle found in the blood vessels is called _____.
    a) visceral smooth muscle
    b) striated muscle
    c) cardiac muscle
    d) skeletal muscle

27. Into what does the neuron release its neurotransmitter at the neuromuscular junction?
    a) motor end plate
    b) cytoplasm of the muscle cell
    c) cisternae
    d) synaptic cleft

28. Which of the following surrounds the individual muscle cell?
    a) perimysium
    b) endomysium
    c) epimysium
    d) fascicle

29. Excitation-contraction coupling requires which of the following substances?
    a) Ca2+ and ATP
    b) Ca2+ only
    c) ATP only
    d) ATP and glucose

30. Myoglobin _____.
    a) breaks down glycogen
    b) is a protein involved in the direct phosphorylation of ADP
    c) stores oxygen in muscle cells
    d) produces the end plate potential

31. What is the functional role of the T tubules?
    a) stabilize the G and F actin
    b) enhance excitation-contraction coupling in muscle
    c) hold cross bridges in place in a resting muscle
    d) synthesize ATP to provide energy for muscle contraction

32. Muscles that are not used, may degenerate or undergo a process of _____.
    a) atrophy
    b) hypertrophy
    c) fatigue
    d) tetany

33. Cells that store large quantities of chemicals to be releases do so in structures called _____.
    a) snares
    b) docking sacs
    c) fusion sacs
    d) vesicles

34. The nodes of Ranvier are found _____.
    a) in the CNS only
    b) on dentraites
    c) on the neuroglia
    d) on myelinated axons

35. Neurotransmitters are removed from the synaptic cleft by all of the following *except*: _____.
    a) reuptake by a presynaptic neuron
    b) simple diffusion
    c) enzymatic degradation
    d) presynaptic inhibition

36. The presynaptic neuron releases neurotransmitters in response to an influx of _____ ions.
    a) sodium
    b) potassium
    c) calcium
    d) sodium and potassium

37. The space between the presynaptic and postsynaptic membranes is called the _____.
    a) synaptic cleft
    b) neurotransmitter
    c) synaptic delay
    d) synaptic vesicle

38. The action potential is initiated in the _____.
    a) axon terminals
    b) dendrites
    c) cell body
    d) initial segment
    e) axon hillock

39. The smallest contractile unit of skeletal muscle is a:
    a) sarcomere
    b) motor unit
    c) synapse
    d) thin filament

40. The Na+/K+ pump transports _____.
    a) Na+ into and K+ out of the cell
    b) Na+ out of and K+ into the cell
    c) equal numbers of Na+ out of and K+ into the cell
    d) more K+ into than Na+ out of the cell

41. The plasma membrane is more permeable to _____.
    a) sodium ions
    b) potassium ions
    c) Calcium ions
    d) Magnesium ions

42. Select the correct statement regarding adipose tissue.
    a) It is composed mostly of extracellular matrix.
    b) Its primary function is nutrient storage.
    c) Mature adipose cells are highly mitotic.
    d) Most of the cell volume is occupied by the nucleus.

43. The value of the resting membrane potential in a neuron is _____.
    a) -70 mV
    b) +30 mV
    c) -90 mV
    d) -55 mV

44. A many-layered epithelium with cuboidal basal cells and flat cells at its surface would be classified as _____.
    a) simple cuboidal
    b) simple squamous
    c) transitional
    d) stratified squamous

45. Which statement best describes connective tissue?
    a) usually contains a large amount of matrix
    b) typically arranged in a single layer of cells
    c) primarily concerned with secretion
    d) usually lines a body cavity

46. The shape of the external ear is maintained by _____.
    a) adipose tissue
    b) elastic cartilage
    c) hyaline cartilage
    d) fibrocartilage

47. Peroxisomes _____.
    a) are also called microbodies, and contain acid hydrolases
    b) are able to detoxify substances by enzymatic action
    c) function to digest particles ingested by endocytosis
    d) sometimes function as secretory vesicles

48. The dorsal body cavity is the site of which of the following?
    a) intestines
    b) brain
    c) lungs
    d) liver

49. Which term means toward or at the back of the body, behind?
    a) anterior
    b) lateral
    c) distal
    d) dorsal

50. The anatomical position is characterized by all of the following except _____.
    a) body erect
    b) arms at sides
    c) palms turned posteriorly
    d) thumbs pointed laterally