

- Cellular elements that produce the collagen fibers of bone matrix are:
 - collagen fibers
 - osteoblasts
 - reticular fibers
 - chondrocytes
 - osteoclasts
- After acetylcholine attaches to its receptors at the neuromuscular junction, the **next** step is:
 - potassium-gated channels open
 - the T-tubules depolarize
 - cross bridges attach
 - ATP is hydrolyzed
- The point at which an impulse from one nerve cell is communicated to another nerve cell is the:
 - cell body
 - synapse
 - receptor
 - effector
 - axon hillock
- _____ is found in the skeleton of the external ear.
 - fibrocartilage
 - irregular dense connective tissue
 - hyaline cartilage
 - elastic cartilage
 - elastic connective tissue
- In the contraction of skeletal muscle, calcium apparently acts to:
 - increase the action potential transmitted along the sarcolemma
 - release the inhibition on Z disks
 - remove the blocking action of tropomyosin
 - cause ATP binding to actin
 - all of the above
- A phospholipid is usually:
 - partially hydrophilic and partially hydrophobic
 - entirely hydrophobic
 - entirely hydrophilic
 - neither hydrophilic nor hydrophobic
 - none of the above
- When ions move through opened channels during the depolarization and repolarization phases of an action potential, they are moving by:
 - primary active transport
 - secondary active transport
 - exocytosis
 - filtration

ANP1105 - Study Group 4

- E. simple diffusion
8. Which of the following surrounds the individual muscle cell?
- A. perimysium
 - B. endomysium**
 - C. epimysium
 - D. fascicle
9. Immediately after the arrival of the stimulus at a skeletal muscle cell, there is a short period called the _____ during which the events of excitation-contraction coupling occur.
- A. precontraction period
 - B. relaxation period
 - C. latent period**
 - D. none of the above
10. Which of the following statements concerning types of muscle contraction is FALSE?
- A. in isometric contractions, the amount of tension produced by the muscle is constant**
 - B. in isotonic contractions, the muscle fiber shortens
 - C. both isotonic and isometric contractions involve excitation-contraction coupling
 - D. most body movements are produced by a combination of isotonic and isometric contractions
11. There is one-way conduction at a synapse because:
- A. only postsynaptic dendrites contain synaptic vesicles
 - B. acetylcholine prevents nerve impulses from traveling in both directions
 - C. only the postsynaptic dendrites possess neurotransmitter receptors**
 - D. only postsynaptic dendrites release neurotransmitters
12. Which of the following is NOT a **major** tissue type found in the human body?
- A. epithelial
 - B. connective
 - C. muscular
 - D. blood**
 - E. nervous
13. What structure in skeletal muscle cells functions in calcium storage?
- A. sarcoplasmic reticulum**
 - B. mitochondria
 - C. intermediate filament network
 - D. myofibrillar network
14. The function of myoglobin is to:
- A. bind oxygen for aerobic respiration**
 - B. bind actin to shorten myofibrils
 - C. block the myosin binding sites on thin filaments
 - D. store ATP
 - E. A) and D)

ANP1105 - Study Group 4

15. A cluster of rough endoplasmic reticulum, specific to neurons, is the:
- A. Nissl body
 - B. soma
 - C. axon terminal
 - D. node of Ranvier
16. The plasma membrane of a resting neuron is more permeable to potassium ions than to sodium ions because the membrane has:
- A. more voltage-gated sodium ion channels
 - B. more ligand-gated potassium ion channels
 - C. more potassium leakage channels
 - D. fewer voltage-gated sodium ion channels
 - E. more carrier molecules for potassium ions
17. Which of the following statements is FALSE?
- A. Epithelial cells always exhibit polarity; that is, they have a free surface and a basal surface
 - B. Stratified epithelia are always tall, narrow cells
 - C. In the respiratory tract, goblet cells are found with pseudostratified ciliated columnar epithelium
 - D. The shock-absorbing pads between the vertebrae are formed of fibrocartilage
 - E. All of the above statements are false
18. What is the main type of fiber in dense connective tissue?
- A. glia
 - B. elastin
 - C. collagen
 - D. reticular
19. The Na^+/K^+ ATPase:
- A. pumps 3 Na^+ ions outside the cell and 2 K^+ ions inside
 - B. pumps 3 Na^+ ions outside the cell and 3 K^+ ions inside
 - C. pumps 3 Na^+ ions inside the cell and 2 K^+ ions outside
 - D. pumps 2 Na^+ ions inside the cell and 3 K^+ ions outside
20. Detachment of the cross bridges is directly triggered by:
- A. repolarization of the T tubules
 - B. the power stroke
 - C. attachment of ATP to myosin heads
 - D. hydrolysis of ATP
21. Which of the following is TRUE?
- A. Chromatin consists of exclusively of DNA and RNA
 - B. The glycocalyx is somewhat fuzzy and sticky because of the numerous cholesterol chains sticking out from the surface of the cell membrane
 - C. Microtubules are hollow tubes made of the protein tubulin
 - D. Microfilaments are thin strands of the contractile protein myosin
22. The part of a neuron that conducts impulses away from its cell body is called a(n):
- A. axon

ANP1105 - Study Group 4

- B. dendrite
- C. neurolemma
- D. Schwann cell
- E. Nissl body

23. In what way does the interior surface of a cell membrane of a resting neuron differ from the environment immediately outside that neuron?

- A. positively charged and contains less sodium
- B. negatively charged and contains less sodium**
- C. negatively charged and contains more sodium
- D. positively charged and contains more sodium

24. Histology could be defined as a study of:

- A. cells
- B. tissues**
- C. cell chemistry
- D. the gross structures of the body

25. A macrophage encounters a bacterium. What must it do first in order to be able to digest that bacterium?

- A. pinocytosis
- B. exocytosis
- C. phagocytosis**
- D. mitosis
- E. leukocytosis

26. During the depolarizing spike of an action potential:

- A. K^+ gates are open
- B. Na^+ gates are open**
- C. Na^+/K^+ ATPase is maximally active
- D. A) and B)
- E. none of the above

27. Simple columnar epithelium of absorptive areas of the gastrointestinal tract such as the small intestine is characterized by:

- A. dense microvilli**
- B. a rich vascular supply
- C. fibroblasts
- D. cilia

28. An epithelium "built" to withstand friction is:

- A. simple squamous
- B. simple cuboidal
- C. pseudostratified columnar
- D. stratified squamous**
- E. simple columnar

ANP1105 - Study Group 4

29. Which of the following is composed of myosin?
- A. thick filaments
 - B. thin filaments
 - C. all myofilaments
 - D. Z disc
 - E. A) and D)
30. The junctions that link cells strongly together so that they can resist mechanical stress are called:
- A. gap junctions
 - B. tight junctions
 - C. desmosomes
 - D. receptor junctions
 - E. anchoring junctions
31. The role of acetylcholinesterase is to:
- A. act as transmitting agent
 - B. amplify or enhance the effect of acetylcholine
 - C. destroy acetylcholine a brief period after its release by the axonal endings
 - D. stimulate the production of serotonin
 - E. catalyze the synthesis of acetylcholine
32. Which of the following statements concerning the **resting membrane potential** is TRUE?
- A. Na^+ tends to diffuse out of the cell
 - B. The resting membrane potential exists because the cell membrane is more permeable to Cl^- than it is to K^+
 - C. K^+ tends to diffuse out of the cell
 - D. The cell membrane is more permeable to Na^+ than to K^+
 - E. K^+ tends to diffuse towards the axonal terminals
33. Which of the following statements is TRUE?
- A. When a muscle fiber contracts strongly, the I bands diminish in size, the H zones disappear and the A bands move closer together but do not diminish in length
 - B. Cardiac muscle cells are relatively short, tapering cells with a single, centrally located nucleus
 - C. The thin filaments (actin) contain a polypeptide subunit G-actin that seems to have no function
 - D. A nerve cell and all the muscle cells it stimulates are referred to as a motor end plate
34. You have a 2.0 molar solution of NaCl. You want to make a solution of glucose that has the same osmolarity as this NaCl solution. What concentration (molar) should this glucose solution be?
- A. 0.5
 - B. 1.0
 - C. 2.0
 - D. 4.0
 - E. 8.0
35. Crenation (cell shrinking) occurs when red blood cells are placed in a(n):

ANP1105 - Study Group 4

- A. isotonic solution
 - B. hypertonic solution**
 - C. hypotonic solution
 - D. plasma
36. Which of the following statements is TRUE?
- A. A myelin sheath increases conduction velocity because it contains many ion channels
 - B. The conduction velocity of an axon increases with increasing axon diameter**
 - C. Neurons are the only polarized cells in the body
 - D. A myelinated fiber conducts impulses more slowly than an unmyelinated fiber
 - E. The conduction velocity of axons is always the same
37. In a **relaxed** muscle fiber, which of the following are found in the H zone?
- A. thick filaments**
 - B. thin filaments
 - C. cross bridges
 - D. both thick and thin filaments
 - E. thick filaments and cross bridges
38. An organ is defined as a structure that is composed of two or more different types of:
- A. molecules
 - B. cells
 - C. systems
 - D. tissues**
 - E. membranes
39. Which of the following is TRUE for both EPSPs and actions potentials?
- A. membrane depolarization**
 - B. simultaneous movement of Na^+ and K^+
 - C. graded depolarization
 - D. sequential movement of Na^+ and then K^+
 - E. A) and D)
40. The functional role of the T tubule is to:
- A. stabilize the G and F actin
 - B. enhance cellular communication during muscle contraction**
 - C. hold cross bridges in place in a resting muscle
 - D. synthesize ATP to provide energy for muscle contraction
 - E. none of the above
41. Osmosis is a special case of diffusion in which:
- A. a solute moves against its concentration gradient
 - B. water moves down its concentration gradient**
 - C. water is moving against its concentration gradient
 - D. water is moving from an area of high solute concentration to an area of low solute concentration
 - E. B) and D)

ANP1105 - Study Group 4

42. Cells try to move sodium ions from the cytoplasm to the outside of the cell where the sodium concentration is 14 times higher than in the cytoplasm. This means sodium ions are moved out of the cells by:
- A. simple diffusion
 - B. facilitated diffusion
 - C. osmosis
 - D. active transport**
 - E. exocytosis
43. What would happen if a resting neuron suddenly became very permeable to Na^+ ?
- A. Na^+ would move out of the cell
 - B. The membrane potential would become more negative
 - C. There would be no net movement of Na^+
 - D. Na^+ would move into the cell**
 - E. There would be no net change in membrane potential
44. If a 0.9% saline solution is isotonic to the cell, then a 0.5% saline solution:
- A. is hypertonic to the cell
 - B. will cause crenation (shrinking of the cell)
 - C. is hypotonic to the cell**
 - D. B) and C)
45. Fused tetanus is:
- A. a phenomenon that occurs in striated and cardiac muscle cells
 - B. a sustained contraction with partial relaxation between stimuli
 - C. a sustained contraction in which individual twitches cannot be discerned**
 - D. a brief contraction of all the fibers in a motor unit
46. The type of cell junction that prevents the contents of the stomach or urinary bladder from leaking into surrounding tissues is the:
- A. adherens junction
 - B. gap junction
 - C. desmosomes
 - D. integral junction
 - E. tight junction**
47. The electrochemical gradient for _____ is enhanced by the resting membrane potential of a neuron.
- A. Na^+**
 - B. K^+
 - C. Ca^+
 - D. none of the above
48. Which of the following is a characteristic of a graded potential?
- A. produced at axon hillock
 - B. all-or-none
 - C. current decreases with distance travelled**
 - D. always induces membrane hyperpolarization
 - E. causes release of neurotransmitters

ANP1105 - Study Group 4

49. The type of epithelium seen in the urinary bladder is:
- A. simple squamous epithelium
 - B. simple cuboidal epithelium
 - C. pseudostratified columnar epithelium
 - D. stratified squamous epithelium
 - E. transitional epithelium**
50. Glands, such as the thyroid, that secrete their products directly into the blood rather than through ducts are classified as:
- A. exocrine
 - B. endocrine**
 - C. sebaceous
 - D. apocrine