1. The plasma membrane presents a(n) ..... barrier to free diffusion of solutes.

A. hydrophilic
B. semi permeable
C. hydrophobic
D. water-soluble

2. Osmosis is a special case of diffusion in which:

A. water moves down its concentration gradient.
B. water is moving against its concentration gradient.
C. water is moving from an area of high solute concentration to an area of low solute concentration
D. A. and C.

3. The most abundant chemical substance in the body accounting for 60 to 80% of body weight is

A. protein
B. water
C. oxygen
D. hydrogen

4. A multilayered 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
E. None of the above; there is no epithelium that matches this description.

5. Pseudostratified columnar epithelium ciliated variety _____.

A. lines most of the respiratory tract
B. aids in digestion
C. possesses no goblet cells
D. is not an epithelial classification

6. 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

7. Active transport:

A. is specific
B. involves carrier
C. moves substances against a concentration gradient
D. A., B. and C.

8. The process by which large particles may be taken into the protection of the body by invaders like bacteria, or for disposing of old or dead cells is called

A. Endocytosis
B. Pinocytosis
C. Phagocytosis
D. Exocytosis

9. The two layers of the basement membrane are the

A. apical and basal layers
B. parietal and visceral layers
C. lamina propria and epithelial layers
D. avascular and vascular layers
E. basal lamina and reticular lamina

10. Peripheral proteins are:

A. proteins that are attached to integral proteins (usually internal side of plasma membrane)
B. proteins of the extracellular matrix that bind to the plasma membrane
C. proteins of the plasma membrane that contact both the interstitial fluid and the cytoplasm
D. proteins of the extracellular matrix that don't interact with the plasma membrane

11. The function of cholesterol in the plasma membrane is to:

A. increase membrane fluidity (make it less rigid).
B. stabilize the cell membrane while decreasing the mobility of the phospholipids.
C. make the inside of the cell negative with respect to the outside
D. act as an energy store for nerve and muscle activity

12. Desmosomes:

A. Fuse the cell membranes of adjacent cells to prevent the diffusion of molecules in solution
B. Are clusters anchoring molecule, linking cells together to resist mechanical stress
C. Form molecular channels between cells to allow passage of small molecules and charged ions
D. All of the above are true

13. Which of the following statements is TRUE?

A. The basic difference between dense irregular and dense regular connective tissue is the amount of elastic fibers and adipose cells present.
B. Sweat glands are apocrine glands.
C. Blood is a type of connective tissue.
D. Connective tissues that possess a large quantity of collagen fibers often provide the framework for organs such as the spleen and lymph nodes.
E. All of the above statements are true.

14. The cell membrane is freely permeable to

A . Fat
B. Oxygen
C. Urea
D. All of the above

15. 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

16. The Na+/K+ ATPase:

A. pumps 3 Na+ ions outside the cells 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.

17. Multicellular exocrine glands can be classified:

A. structurally into alveolar and acinar types
B. structurally into ductless and ducted types
C. functionally into merocrine, holocrine, and apocrine divisions
D. All of the above are correct

18. Crenation (cell shrinking) occurs when a blood cell is placed in a(n) ..... solution.

A. isotonic
B. hypertonic
C. hypotonic
D. merotonic

19. Secondary active transport relies directly on

A. the concentration gradient for glucose
B. the hydrolysis of ATP
C. the resting membrane potential
D. the concentration gradient for Na+

20. In an axon, newly synthesized proteins move due to

A. retrograde transport
B. anterograde transport
C. carrier mediated Transport
D. action potentials

21. Select the correct statement concerning epithelia.

A. Stratified epithelia are tall, narrow cells.
B. Stratified epithelia are present where protection from abrasion is important.
C. Stratified epithelia are seldom found in the human body.
D. Pseudostratified epithelia consist of at least two layers of cells stacked on top of one another.

22. Regarding the membrane potential.

A. In their resting state, all body cells exhibit a resting membrane potential.
B. The resting membrane potential occurs due to active transport of ions across the membrane due to the sodium-potassium pump.
C. The resting membrane potential is determined mainly by the concentration gradients and differential permeability of the plasma membrane to K^+ and Na^+ions.
D. All of the above are true

23. 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 presynaptic dendrites release neurotransmitters.

24. Action potential travel down the axon is associated with:

A. graded potentials
B. chemically gated ion channels
C. hyperpolarization
D. voltage-gated sodium channels

25. Phrases that describe cartilage include:

A. avascular
B. holds large volumes of water
C. is not innervated
D. contains collagen fibers
E. All of the above

26. A cluster of neuron cell bodies in the peripheral nervous system is known as a/an:

A. nissl body
B. axon hillock
C. ganglion
D. node of Ranvier

27. Dendrites:

A. conduct action potentials away from the cell body
B. are the site of neurotransmitter release
C. are generally long and unbranched
D. produce only graded potentials

28. The area on an axon between 2 Schwann cell sheaths is the:

A. nissl body
B. soma
C. node of Ranvier
D. axon hillock

29. Collagen in connective tissue proper is produced by:

A. macrophages
B. fibroblasts
C. hemocytoblasts
D. osteoblasts
E. chondroblasts

30. Which of these features does not distinguish neurons from most other cells?

A. Extreme longevity
B. Amitotic
C. High metabolic rate
D. Negative potential across the plasma membrane

31. What types of gated channels are found in the conductive region of a neuron?

A. Ligand gated Na+ channels
B. Voltage gated Na+ channels
C. Voltage gated K+ channels
D. B and C are correct

32. White matter in the brain looks white because of the many

A. synapses
B. astrocytes
C. neuronal cell bodies
D. processes of oligodendrocytes

33. Most exocrine glands in the human body are classified as:

A. acinar
B. apocrine
C. holocrine
D. merocrine
E. endocrine

34. Creatine phosphate functions in the muscle cell by

A. forming a temporary chemical compound with myosin
B. forming a chemical compound actin
C. storing energy that will be transferred to ADP to resynthesize ATP
D. inducing a conformational change in the myofilaments

35. What is the role of tropomyosin in skeletal muscles?

A. Tropomyosin serves as a contraction inhibitor by blocking the myosin binding site on the actin molecules
B. Tropomyosin serves as a contraction inhibitor by blocking the actin binding site on the myosin molecule
C. Tropomyosin is the chemical that activates the myosin head
D. Tropomyosin is the receptor for the motor neuron transmitter

36. The major function of the sarcoplasmic reticulum in muscle contraction is to:

A. make and store creatine phostphate
B. synthesize actin and myosin myofilaments
C. provide a source of myosin for the contraction process
D. regulate intracellular calcium concentrations

37. In a skeletal muscle fiber, which of the following best describes the composition of the structure known as a triad?

A. Actin, troponin and tropomyosin
B. Sarcolemma, sarcoplasm and sarcoplasmic reticulum
C. Terminal cisterna, transverse tubule and terminal cisterna
D. A band, I band and H band

38. Muscle tone is:

A. also called treppe
B. the feeling of well-being following exercise
C. a state of sustained partial muscle contraction
D. the condition of an athlete after intensive training

39. Muscle tissue has all the properties except

A. secretion
B. excitability
C. contractility
D. extensibility

40. 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

41. Which of the following is considered a unicellular exocrine gland?

A. mast cell
B. plasma cell
C. fibroblast
D. adipocytes
E. goblet cell

42. The "cis" face of the Golgi apparatus:

A. is where products are dispatched in vesicles
B. is its concave face
C. receives transport vesicles from the rough endoplasmic reticulum
D. is in the centre of the Golgi stack
E. is continuous with the nuclear membrane

43. Centrioles:

A. are the site of growth of microtubules during mitosis
B. provide a whip like beating motion to move substances along cell surfaces
C. serve as the site for ribosomal RNA synthesis
D. produce ATP

44. One of the key contractile mechanism protein found in skeletal muscle but not in smooth muscle is

A. Tropomyosin
B. Myosin
C. Actin
D. troponin

45. What is the role of calcium ions in muscle contraction?

A. form hydroxyapatite crystals
B. reestablish glycogen stores
C. bind to regulatory sites on troponin to remove contraction inhibition
D. increase levels of myoglobin

46. Which of the following is the connective tissue sheath that wraps individual muscle fibers?

A. endomysium
B. perimysium
C. epimysium
D. aponeurosis

47. During vigorous exercise, there may be insufficient oxygen available to completely break down pyruvic acid for energy. As a result, the pyruvic acid is converted to _____.

A. a strong base
B. stearic acid
C. hydrochloric acid
D. lactic acid