1. **Which of the following mature cells do not have nuclei?**

   A. Red blood cells
   B. Astrocytes
   C. Neurons
   D. Columnar epithelial cells

2. **Which of the following is true about the smooth endoplasmic reticulum?**

   A. It is devoid of ribosomes
   B. It is involved in lipid synthesis
   C. It is involved in protein synthesis
   D. Both A) and B)
   E. Both A) and C)

3. **Which of the following is true about the lysosomes?**

   A. They store proteins and lipids produced at the endoplasmic reticulum
   B. They contain proteolytic enzymes
   C. Their main function is to neutralize free radicals
   D. They contain their own DNA

4. **Peroxisomes:**

   A. absorb nutrients from digested food and store them for future use
   B. produce mucus that protects parts of the digestive organs from the effects of powerful enzymes
   C. provide protection against free radicals and toxins
   D. secrete buffers in order to keep the pH of the digestive tract close to neutral

5. **Cell types likely to be found in areolar connective tissue include:**

   A. fibroblasts
   B. macrophages
   C. mast cells
   D. all of the above

6. **Mitochondria:**

   A. are double membrane structures involved in breakdown of ATP
   B. synthesize proteins for use outside of cell
   C. are involved in production of ATP
   D. are found only in muscle cells

7. **The plasma membrane of human cells:**

   A. is semi-permeable
   B. contains phospholipids and cholesterol
   C. contains protein channels and receptors
   D. A) and B)
   E. all of the above

8. **Movement of swater through a selectively permeable membrane is called:**

   A. diffusion
   B. facilitated diffusion
   C. osmosis
   D. active transport
   E. endocytosis

9. **Glucose and amino acids can cross cellular membranes of the intestinal epithelium and enter the epithelial cells together with sodium ions:**

   A. via simple diffusion
   B. via facilitated diffusion
   C. via active transport
   D. using clathrin-coated vesicles that capture glucose and sodium molecules via pinocytosis
   E. using the difference in sodium concentration gradient created by the action of the sodium-potassium pump

10. **Select the correct statement(s) regarding epithelia:**

    A. stratified epithelia are present where protection from abrasion is needed
    B. cells of the skin epithelium easily separate when skin is poked with a finger or pinched
    C. simple squamous epithelium line blood vessels
    D. both A) and B)
    E. both A) and C)

11. **The principal function of cholesterol within the cell membrane is to:**

    A. provide an energy source
    B. provide a means of communication among cells
    C. stabilize the membrane and regulate its fluidity
    D. act as transporter

12. **Which of the characteristics of lose connective tissue is TRUE?**

    A. It is usually well vascularized and innervated
    B. It is usually arranged in a single layer of cells
    C. It is primarily concerned with secretion
    D. It lines all of the body's cavities and chambers

13. **Which of the following junctions binds neighboring cells and is linked to intracellular actin filaments?**

    A. Tight junction
    B. Desmosome
    C. Glycocalyx
    D. Adherens junction

14. **Which of the following statements is CORRECT regarding diffusion?**

    A. The rate of diffusion is independent of temperature
    B. Molecular weight of a substance does not affect the rate of diffusion
    C. The lower the difference in concentration gradient between two sides of the membrane, the faster the rate of diffusion
    D. The greater the difference in concentration gradient between two sides of the membrane, the faster the rate of diffusion

15. Goblet cells:

A. produce hormones and secrete them to blood
B. secrete their products onto body surfaces and body cavities via active transport
C. are numerous in the digestive and respiratory systems
D. all of the above

16. High body content of the adipose tissue:

A. has been associated with chronic inflammation
B. may lead to insulin resistance and type 2 diabetes mellitus
C. has been associated with elevated CRP levels reflecting increased number but not size of the adipose cells
D. both A) and B)
E. both B) and C)

17. The region of neurons where the secretory vesicles with neurotransmitters are stored is called:

A. soma
B. axon terminal
C. Nissl body
D. dendrite

18. An excitatory neurotransmitter that leads to change in hillock's membrane potential from -70 to -65 mV causes:

A. production of an action potential at the hillock
B. opening of the ligand-gated channels at the hillock
C. partial depolarization at the hillock
D. hyperpolarization at the hillock

19. Soma (cell body) of postsynaptic neurons:

A. stores neuroransmitters
B. contains centrioles and mitotic spindles needed for cell division
C. contains voltage-gated channels
D. contains ligand-gated postsynaptic receptors

20. Which of the following is true about the saltatory conduction?

A. It takes place in myelinated fibers only
B. It takes place in all types of axons
C. It takes place in dendrites

21. A positive feedback is observed:

A. between sodium influx and depolarization during a depolarizing phase of action potential
B. between potasium influx and depolarization during a depolarizing phase of action potential
C. between sodium influx and repolarization
D. between sodium and potassium

22. During an absolute refractory period:

A. sodium gates are closed and potassium gates are opened
B. sodium and potassium gates are opened
C. all of the gates are closed
D. sodium gates are opened and potassium gates are closed

23. The part of a neuron that generates and conducts impulses (action potentials) is called:

A. soma
B. axon
C. dendrite
D. neurolemma
E. Schwann cell

24. Neuroglia of the CNS that can modulate the availability of neurotransmitters and/or postsynaptic binding of neurotransmitters, are called:

A. ependymal cells
B. Schwann cells
C. oligodendrocytes
D. astrocytes
E. microglia

25. Which of the following is TRUE about the electrical synapses?

A. Their communication is usually unidirectional
B. They use gap junctions for fast and synchronized impulse transmission
C. They are found in the neuromuscular junctions
D. All of the above

26. Which of the following will occur when an excitatory postsynaptic potential (EPSP) is being generated on the dendritic spike's membrane?

A. Specific sodium gates will open and an action potential will be produced
B. Specific potassium gates will open and a neuron will become hyperpolarized
C. Sodium gates will open first, then close as potassium gates open leading to production of an action potential and opening of the postsynaptic gates
D. A single type of channel for sodium and potassium will open leading to depolarization and a graded potential

27. Factor(s) contributing to a negative resting membrane potential of neurons include(s):

A. leakage of sodium ions out of the neuron
B. leakage of potassium ions out of the neuron
C. presence of the negatively charged organic molecules inside the neurons
D. Both A) and B)
E. Both B) and C)

28. A neuronal circuit in which a single impulse is transmitted over and over again is a:

A. diverging circuit
B. converging circuit
C. parallel circuit
D. reverberating circuit

29. The point at which one neuron communicates with another neuron is called:

A. synapse
B. cell body
C. receptor
D. effector
E. axon hillock

30. Calcium ions play an essential role in chemical synapses. They:

A. are responsible for generation of the action potentials on the soma of postsynaptic membranes
B. are necessary for exocytosis of neurotransmitters from the presynaptic terminal knobs of axons
C. are responsible for opening of the chemically-gated ions channels on the postsynaptic membrane

31. Which of the following statements is TRUE?

A. Myelination of neuronal axons in the peripheral nervous system is performed by oligodendrocytes.
B. The afferent nerve fibers carry impulses from the CNS to the effectors
C. Neurons are characterized by a long lifespan
D. Regions of the brain and spinal cord containing dense collection of myelinated fibers are called ganglia

32. When acetylcholine binds to chemically-gated postsynaptic receptors it can:

A. lead to fast opening of the ion channels letting both sodium and potassium move into the postsynaptic neuron
B. lead to slower opening of the ion channels via the G-protein associated mechanism
C. lead to fast opening of the voltage-gated ion channels on the postsynaptic membrane
D. lead to opening of the ligand-gated channels on the presynaptic membrane

33. During the hyperpolarization phase of an action potential, which of the following situations exists?

A. The inside of the membrane is becoming less negative with respect to the outside
B. The inside of the membrane is becoming more positive with respect to the outside
C. The membrane potential remains equal to the resting membrane potential
D. The inside of the membrane is becoming more negative with respect to the resting membrane potential

34. The major function of the sarcoplasmic reticulum in muscle cells is to:

A. conduct nerve impulses
B. store of calcium
C. synthesize actin and myosin myofilaments
D. provide a source of myosin for the contraction process

35. Calcium ions binding to ..... in the skeletal muscle cells leads to……..

A. troponin;	uncovering of the active sites on actin
B. motor unit;	muscle contraction
C. tropomyosin;	muscle relaxation
D. actin;	uncovering of the active sites on actin

36. In a relaxed muscle fiber, which of the following are found in the H zone?

A. thick filaments only
B. thin filaments only
C. cross bridges
D. both thick and thin filaments
E. thick filaments and cross bridges