Practice exam

ANP 1105

Midterm #1

Date: October 11, 2012

Duration: 1 hr 20 min

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1. **Which of the following mature cells do not divide (undergo mitosis)?**

   A. Neurons
   B. Red blood cells
   C. Epithelial cells
   D. Both A) and B)
   E. Both B) and C)

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

   A. It is involved in energy production
   B. It is involved in lipid synthesis
   C. It is involved in protein synthesis
   D. It stores proteolitic enzymes

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

   A. They store proteins and lipids produced at the endoplasmic reticulum
   B. Their main function is to neutralize free radicals
   C. They contain their own DNA
   D. Their damage may lead to digestion of cell organelles

4. **Peroxisomes:**

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

5. **Which of the following fiber types predominate in tendons?**

   A. Collagen fibres
   B. Elastic fibres
   C. Reticular fibres
   D. Muscle fibres

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 permeable to almost all solutes
   B. contains phospholipids and cholesterol
   C. contains protein channels and receptors
   D. B) and C)
   E. all of the above

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

   A. osmosis
   B. diffusion
   C. facilitated diffusion
   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 symport with sodium ions
   C. using clathrin-coated vesicles that capture glucose and sodium molecules via pinocytosis
   D. using the difference in potassium 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 lines blood vessels and lung alveoli
    D. both A) and B)
    E. both A) and C)

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

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

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

    A. It is usually arranged in a single layer of cells
    B. It is usually well vascularized and innervated
    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 keratin filaments?**

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

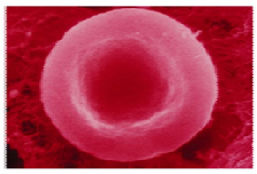
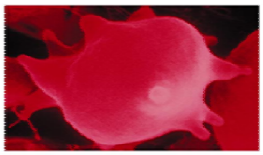
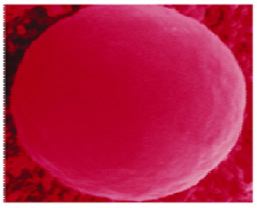
14. Which of the following statements is CORRECT regarding diffusion?

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. High body content of the adipose tissue:

A. has been associated with chronic inflammation
B. has been associated with 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. all of the above

16. **Which of the following (A), (B), or (C) would happen to the red blood cell placed in a hypertonic solution?**

A  B  C 

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

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

18. Dendrites of the excitatory synapses:

A. store dendritic neuroransmitters
B. contain centrioles and mitotic spindles needed for cell division
C. contain dendritic voltage-gated channels
D. contain dendritic spines

19. 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
D. It depends on the content of salt in the intracellular space

20. During an absolute refractory period:

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

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

A. axon
B. soma
C. dendrite
D. neurolemma

22. Neuroglia of the CNS that can phagocyte microorganisms are called:

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

23. 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

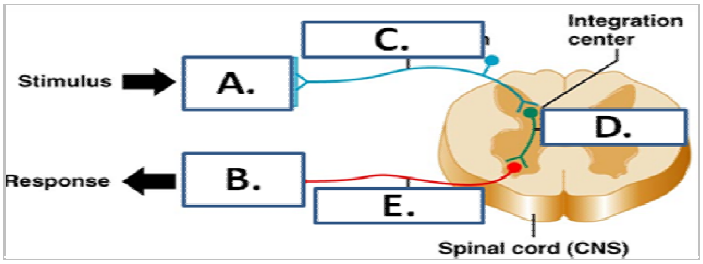
24. Which of the following will occur when an excitatory postsynaptic potential (EPSP) is being generated on the neurons' soma and dendritic membranes?

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

25. One of the main factors contributing to a negative resting membrane potential of neurons is:

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 outside the neurons
D. Influx of chloride ions into the neuron

26. Which of the following represents the motor neuron?



27. Which of the following statements is TRUE?

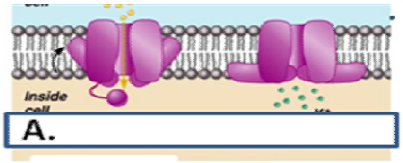
A. Myelination of neuronal axons in the peripheral nervous system is performed by oligodendrocytes.
B. Astrocytes provide oxygen and nourishment to neurons
C. The afferent nerve fibers carry impulses from the CNS to the effectors
D. Regions of the brain and spinal cord containing dense collection of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

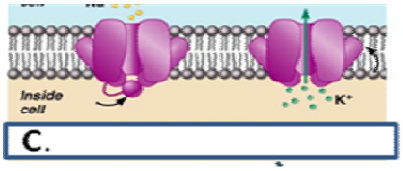
28. The point at which one neuron communicates with another neuron is called:

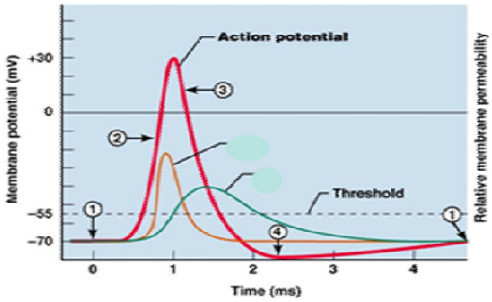
A. synapse
B. cell body
C. receptor
D. effector
E. axon hillock

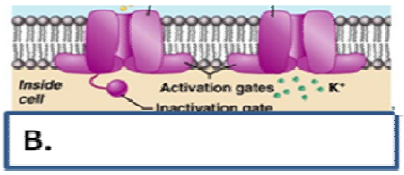
29. Which of the following represents repolarization?

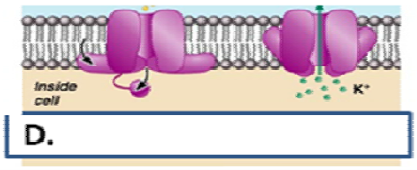
A. A2
B. C2
C. C3
D. D4











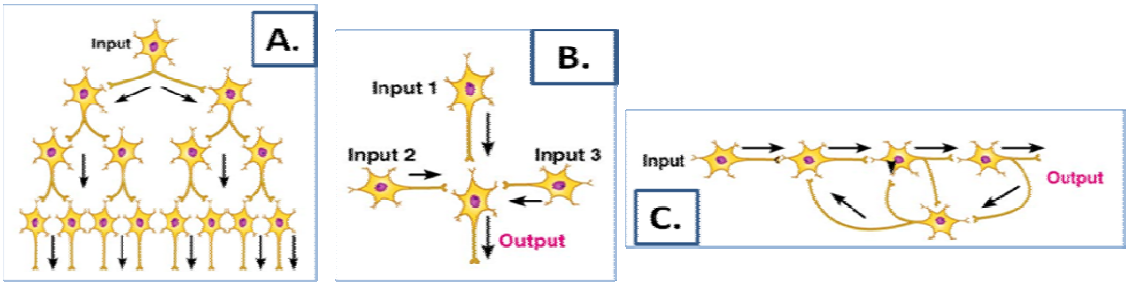
30. Neurons are characterized by:

A. longevity
B. lack of mitosis
C. low metabolic rate
D. both A) and B)
E. both A) and C)

31. Which of the following is true about the action potentials?

A. The amplitude of action potentials depends on the intensity of the stimuli
B. The stronger the stimulus the more frequently action potentials are produced
C. During the absolute refractory period a second action potential can be initiated however only by the stimulus stronger than a previous one
D. All of the above are true

32. Which of the following (A), (B) or (C) represents the reverberating circuit??



33. 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

34. 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

35. The basic contractile unit of a skeletal muscle fiber is:

A. a sarcomere
B. a myofilament
C. a myofibril
D. the sarcoplasmic reticulum

36. Cross-bridge formation (attachment of actin and myosin) requires:

A. breakdown of troponin that blocks active sites on actin
B. removal of tropomyosin from the active sites on actin
C. activation of myosin by hydrolysis of ATP on myosin heads
D. Both A) and B)
E. Both B) and C)

37. Titin is:

A. A protein that attaches actin filaments to Z-discs
B. A giant protein that connects Z-discs to M-line and connects the ends of myosin to the Z-discs
C. A protein that links myosin filaments to the integral proteins of sarcolemma

38. Which of the following statements regarding skeletal muscle is true?

A. Increasing the number of motor units that are activated (hence, muscle mass), increases overall force output during voluntary contraction
B. The smallest motorneurons have the lowest functional threshold and are recruited last
C. The smallest motorneurons innervate the largest muscle fibres
D. None of the above

39. During an isometric contraction, the muscle:

A. becomes longer and moves the load
B. becomes shorter and moves "the load"
C. does not change in length but increases tension
D. becomes shorter but does not change tension

40. Which of the following statements concerning the characteristics of different muscle fibres is TRUE?

A. Fast type IIa fibres produce the greatest force of all muscle fibers and fatigue most easily
B. Slow twitch muscle fibres have generous capillary supply and contain a large number of mitochondria
C. Oxidative, type I muscle fibres have very well developed sarcoplasmic reticulum and fatigue easily
D. Glycolytic (type IIb) muscle fibres have generous capillary supply, contain myoglobin and numerous lipid droplets

41. During a speedy activity such as the 400 meters sprint, the main energy source is:

A. anaerobic: ADP and phosphate
B. anaerobic: ATP and phospocreatine
C. anaerobic: glycogen
D. aerobic: blood glucose
E. aerobic: fatty acids

42. Fused tetanus:

A. is a phenomenon that occurs in striated and cardiac muscle cells
B. is a sustained contraction with partial relaxation between stimuli
C. results from a continuous stimulation
D. results from a very frequent stimulation without a sufficient time for relaxation

43. The force developed by skeletal muscle can be increased by:

A. increased frequency of stimulation
B. increased size and number of motor units recruited
C. increased calcium release from the sarcoplasmic reticulum to the cytosol of muscle fiber
D. Both A) and B)
E. all of the above

44. Muscle fatigue <u>IS NOT</u> caused by:

A. insufficient protein consumption before and during exercise
B. excessive hydrogen ions production during exercise
C. dehydration
D. glycogen depletion

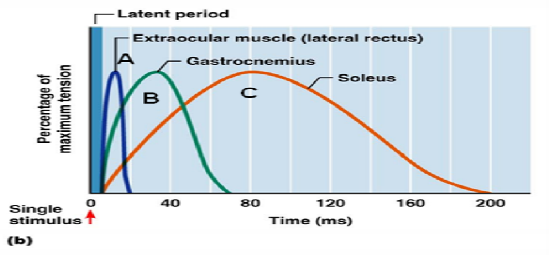
45. Which of the following statements is true about the skeletal muscle fibres?

A. Each skeletal muscle fibre is covered by epimysium
B. All skeletal muscle fibres are aerobic
C. During muscle contraction Z-discs move toward the center of the sarcomere
D. Sarcolemma of the neuromuscular junction contains voltage-gaited channels

46. Amino acids:

A. produce similar amount of energy as fatty acids
B. are usually used for energy during short bursts of intense exercise
C. are never used as energy source
D. may be used as energy source during starvation

47. **Which of the following (A), (B), or (C) represents a single twitch of the slow twitch muscle fibre?**



48. **The function of the T-tubules in skeletal muscle contraction is to:**

A. release calcium into the muscle fiber's cytosol
B. transmit the action potential deep into the muscle cells
C. form proteins
D. store glycogen