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STUDENT NUMBER: 5953168

University of Ottawa
ANP 1105B
Midterm #1

Date: October 4, 2010 Duration: 1 hr 20 min
Instructor: J. Carnegie

INSTRUCTIONS:

1) 53 multiple choice questions (1 mark/1 correct answer per question) plus 7 marks for fill-in-the-blank questions and diagram- labeling.

2) Please answer the multiple choice questions on the computer sheet that is provided and answer the remaining questions right on the last page of this exam.

3) Please put your name and student number at the top of this page, on the top of the last page and on the computer sheet. ***Hand in the last page of the exam and your computer sheet*** when you have finished. You may keep the rest of the exam; correct answers for the MCQs will be posted.

4) Make sure this exam is complete. This exam contains **9** pages **and is printed double sided**. The excuse of missing a page will not be accepted after the examination.

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1. The functional role of the T tubules is to:

   A. stabilize the G and F actin
   B. enhance cellular communication during muscle contraction
   C. hold across bridges in place in a resting muscle
   D. synthesize ATP to provide energy for muscle contraction
   E. none of the above

2. An exocrine gland in which a cell filled with secretory product ruptures and dies in the process of releasing that product is called a(n):

   A. acinar gland
   B. apocrine gland
   C. merocrine gland
   D. simple gland
   E. holocrine gland

11. Pseudostratified cuboidal epithelium:

A. lines the respiratory tract
B. aids in digestion
C. possesses numerous goblet cells
D. is not an epithelial classification

12. Which of the following transport mechanisms is driven by hydrostatic pressure?

A. filtration
B. facilitated diffusion
C. active transport
D. secondary active transport
E. pinocytosis

13. Which statement best describes connective tissue?

A. usually contains a large amount of matrix
B. always arranged in a single layer of cells
C. primarily concerned with secretion
D. usually lines a body cavity

14. All of the following are true for epithelial tissues EXCEPT:

A. they attach to connective tissue via a basement membrane
B. they have a rich blood supply
C. they have a high rate of cell division
D. they have a nerve supply
E. there is little extracellular space between adjacent plasma membranes

15. Which of the following statements is TRUE regarding diffusion?

A. The rate of diffusion is independent of temperature.
B. The steeper the concentration gradient, the faster the rate of diffusion.
C. The molecular weight of a substance does not affect the rate of diffusion.
D. The lower the temperature, the faster the diffusion rate.

16. When ions move across the membrane to cause the depolarization phases of an action potential, they are moving by:

A. primary active transport
B. secondary active transport
C. exocytosis
D. filtration
E. diffusion

17. 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. ATP, creatine phosphate and glucose
E. A band, I band and H band

25. Which of the following statements is TRUE?

A. Almost all of the gated calcium channels are concentrated at the nodes of Ranvier of myelinated axons.
B. Chemically gated channels open when the membrane potential changes.
C. The intensity of a stimulus is indicated by the frequency of nerve impulses (action potentials).
D. The relative refractory period is the period during which the outward current carried by K+ is exactly equal to the inward current carried by Na+.
E. None of the above statements is true.

26. 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

27. The term that means a continued mild or partial contraction in muscle is:

A. tone
B. summation
C. stimulation
D. tetanus
E. twitch

28. 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

29. The threshold of the neuron is the:

A. time between binding of the neurotransmitter and firing of an action potential
B. voltage at which the inflow of sodium ions causes the spike of an action potential
C. total number of sodium ions that enters the cell before the sodium inactivation gates close
D. total amount of neurotransmitter it takes to cause an action potential
E. voltage across the resting cell membrane

30. In an isotonic contraction, the muscle:

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

31. Which of the following is NOT a characteristic of facilitated diffusion?

A. movement of solute down concentration gradient
B. specificity
C. ATP-requiring
D. can be saturated
E. involves a plasma membrane carrier

39. A neurotransmitter that changes the membrane potential from -70 to -65 mV causes:

A. impulse conduction
B. partial depolarization
C. inhibition
D. hyperpolarization
E. production of an action potential

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

A. specific sodium gates will open
B. specific potassium gates will open
C. sodium gates will open first, then close as potassium gates open
D. a single type of channel will open, permitting simultaneous flow of sodium and potassium

41. Which of the following is TRUE for both EPSPs and action 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)

42. Both the electrical and chemical gradients for ..... are enhanced by the resting membrane potential.

A. Na+
B. K+
C. Cl-
D. None of the above

43. Calcium ions play an essential role in chemical synapses because they are necessary for:

A. the release of neurotransmitters by exocytosis.
B. the diffusion of neurotransmitters across the synaptic cleft.
C. the opening of the chemically-gated ions channels of the postsynaptic membrane.
D. the generation of the action potential on the postsynaptic membrane.

44. Phospholipids:

A. are exclusively hydrophilic molecules
B. contain polar tails and nonpolar head groups
C. are both hydrophilic and hydrophobic in nature
D. form the lipid bilayer with tails directed to the outside
E. are exclusively hydrophobic molecules

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

A. Nissl body
B. soma
C. axon terminal
D. node of Ranvier
E. axon hillock

STUDENT NAME: .....

STUDENT NUMBER: .....

University of Ottawa

ANP 1105B

Midterm #2

Date: November 15, 2010

Duration: 1 hr 20 min

Instructors: J. Copeland & J. Carnegie

INSTRUCTIONS:

1) 50 multiple choice questions (1 mark/1 correct answer per question) plus 2 definitions and 4 labels to put on diagrams.

2) Please answer the multiple choice questions on the computer sheet that is provided and answer the remaining questions right on the last page of this exam.

3) Please put your name and student number at the top of this page, the top of the last page and on the computer sheet. Hand in the last page of your exam exam and your computer sheet when you have finished. Keep the MCQ part of the exam; correct answers to the MCQs will be posted online.

4) Make sure this exam is complete. This exam contains **9** pages (printed double-sided). The excuse of missing a page will not be accepted after the examination.

9. The extrinsic pathway of coagulation is activated by the:

   A. sticking of platelets to roughened blood vessel walls
   B. activation of a proenzyme exposed to collagen
   C. release of heparin from the liver
   D. the conversion of prothrombin to thrombin
   E. the release of tissue factor by damaged tissue cells

10. Three discrete types of muscle fibers are identified on the basis of their size, speed and endurance. Which of the following athletic endeavors best represents the use of slow oxidative fibers?

   A. a sprint by an Olympic runner
   B. a long, relaxing swim
   C. lifting weights
   D. playing tennis

11. What is the difference between a thrombus and an embolus?

   A. An embolus is a thrombus that has become mobile.
   B. A thrombus occurs in the bloodstream whereas an embolus occurs outside the bloodstream.
   C. An embolus occurs in arteries and a thrombus occurs in veins.
   D. A thrombus is a blood clot and an embolus is a parasitic worm.

12. During the isovolumetric contraction, the atrioventricular valves are ....., the aortic and pulmonary valves are..... and aortic pressure is..... .

   A. open, open, increasing
   B. open, closed, decreasing
   C. closed, open, decreasing
   D. closed, closed, decreasing
   E. open, closed, increasing

13. The maintenance of continual partial constriction of the walls of blood vessels (vascular tone) is associated with the:

   A. sympathetic division of the autonomic nervous system
   B. parasympathetic division of the autonomic nervous system
   C. both the sympathetic and parasympathetic divisions of the autonomic nervous system
   D. neither the sympathetic nor parasympathetic divisions of the autonomic nervous system

14. Sympathetic stimulation causes:

   A. decreased blood glucose, increased GI activity, increased heart rate and blood pressure
   B. increased blood glucose, decreased GI activity, increased heart rate and blood pressure
   C. increased blood glucose, increased GI activity, decreased heart rate and blood pressure
   D. decreased blood glucose, increased GI activity, decreased heart rate and blood pressure

15. The deflection waves in an ECG tracing include:

   A. the P wave, which is present only in patients who have had a heart attack.
   B. the Q-T interval, which indicates the duration of atrial contraction.
   C. the PQRS complex, which follows ventricular contraction.
   D. the T wave, which indicates ventricular repolarization.

16. Blood flows into the coronary arteries from the:

   A. coronary sinus
   B. superior vena cava
   C. pulmonary trunk
   D. base of the aorta
   E. descending of the aorta

25. The "resting and digesting" division of the autonomic nervous system is the:

A. parasympathetic division
B. sympathetic division
C. somatic division
D. peripheral division

26. If the vagal nerves to the heart were cut:

A. the heart would stop, since the vagal nerves trigger depolarization of the wall of the heart
B. the heart rate would increase
C. the AV node would become the pacemaker of the heart
D. parasympathetic stimulation would increase, causing a decrease in heart rate

27. The left ventricular wall of the heart is thicker than the right ventricular wall in order to:

A. accommodate a greater volume of blood
B. expand the thoracic cage during diastole
C. pump blood with greater pressure
D. pump blood through a smaller valve

28. A major difference between neurotransmitters and hormones is that hormones are secreted:

A. directly into their target cell
B. into the cerebrospinal fluid
C. into the blood
D. into ducts

29. Smooth muscle fibers:

A. all act as pacemakers
B. contain Z discs that anchor the thin contractile proteins
C. are innervated by the autonomic nervous system
D. can make their own connective tissue
E. all of the above

30. You are typing a sample of blood. When neither antiserum A nor antiserum B causes the appearance of a precipitate in the blood drops on the best slide, then the blood is type:

A. A
B. B
C. AB
D. O
E. cannot determine because a second test is required

31. All of the following are properties of erythrocytes EXCEPT:

A. biconcavity
B. reversible deformability
C. presence of hemoglobin in cytoplasm
D. presence of many mitochondria in cytoplasm

32. If the atria were unable to contract (SA node nonfunctional), approximately what percentage of ventricular filling would still be able to occur?

A. 25%
B. 35%
C. 50%
D. 70%
E. 85%

40. Damage to the ..... is referred to as heart block.

A. SA node
B. AV valves
C. Purkinje fibers
D. AV node
E. Ventricular node

41. The two hormones released from the posterior pituitary are synthesized in the:

A. anterior pituitary
B. posterior pituitary
C. hypothalamus
D. infundibulum
E. none of the above

42. In a feedback system, what are the organs that change the internal environment of the body called?

A. hormones
B. stimulators
C. regulators
D. receptors
E. effectors

43. Cardiac muscle fibers remain depolarized longer than skeletal muscle fibers because:

A. voltage-gated sodium channels close more quickly to trap sodium inside longer
B. calcium enters the cytosol from the extracellular fluid to contribute more positive charge slightly after sodium has entered
C. voltage-gated potassium channels open at the same time as sodium channels, allowing more positively charged potassium to enter
D. it takes longer to reach threshold, and the duration of depolarization is directly proportional to the time it takes to reach threshold
E. the intercalated discs are very thick relative to the rest of the sarcolemma and it takes longer for potassium to exit the cell to cause repolarization

44. Which of the following is an enzyme that converts fibrinogen to fibrin?

A. plasmin
B. heparin
C. thrombin
D. a-1 antitrypsin
E. thrombinase

45. Cardiac muscle cells:

A. have proportionally more mitochondria than skeletal muscle
B. use both intra- and extracellular calcium for contraction
C. when stimulated contract simultaneously
D. both A) and B) are true
E. all of the above

46. Which of the following statements concerning fast glycolytic muscle fibers is/are TRUE?

A. They contain myosin molecules that break down ATP rapidly.
B. They have large deposits of myoglobin.
C. They are not well adapted to anaerobic metabolism.
D. They have a well-developed blood supply.