University of Ottawa
ANP 1105B
Midterm #2

Date: November 12, 2012 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 **10** pages **and is printed double-sided**. The excuse of missing a page will not be accepted after the examination.

1. Thrombopoietin is a hormone that:

   A. activates thrombin
   B. stimulates platelet production
   C. blocks the activity of thrombin
   D. dissolves thrombi (plural of thrombus)

2. 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

3. Which of the following statements is FALSE?

   A. Fast glycolytic rather than slow oxidative muscle fibers are best for weight-lifting.
   B. Slow oxidative muscle fibers are more powerful than fast glycolytic muscle fibers.
   C. Fast oxidative muscle fibers are more fatigue-resistant than fast glycolytic fibers.
   D. Most body muscles have a mixture of muscle fiber types.
   E. Genetics can influence the relative distribution of fiber types within muscles.

4. A patient with primary hypertension may have a blood pressure as high as 200/120. This hypertensive state can be associated with all of the following EXCEPT:

   A. increased workload by the left ventricle
   B. increased damage to blood vessel endothelium
   C. increased aortic afterload
   D. decreased thickness of the left ventricular wall

5. A good example of a positive feedback mechanism would be:

   A. body temperature regulation
   B. regulation of blood glucose levels
   C. regulation of uterine contractions by oxytocin during labour
   D. regulation of blood calcium levels

6. Which of the following statements is FALSE?

   A. Under stressful conditions, the sympathetic nervous system dominates over the parasympathetic.
   B. Sympathetic cardiac nerves stimulate heart rate whereas parasympathetic cardiac nerves slow down heart rate.
   C. The sympathetic nervous system has a more widespread effect in the body than does the parasympathetic nervous system.
   D. The blood vessels of the skin are one of the few areas of the body where the vessels are innervated by both the sympathetic and parasympathetic nervous system.

7. Which of the following neurons is most likely to be adrenergic (neurotransmitter = norepinephrine)?

   A. preganglionic sympathetic neurons
   B. preganglionic parasympathetic neurons
   C. postganglionic parasympathetic neurons
   D. postganglionic sympathetic neurons

8. The P wave of a normal electrocardiogram indicates _____.

   A. ventricular repolarization
   B. ventricular depolarization
   C. atrial repolarization
   D. atrial depolarization

9. Which of the following are involved directly in the pulmonary circulation?

A. superior vena cava, right atrium, and left ventricle
B. right ventricle, pulmonary artery, and left atrium
C. left ventricle, aorta, and inferior vena cava
D. right atrium, aorta, and left ventricle

10. Releasing and inhibiting hormones are produced by the ..... to control the ..... .

A. hypothalamus // posterior pituitary
B. posterior pituitary // hypothalamus
C. pineal gland // hypothalamus
D. hypothalamus // anterior pituitary
E. anterior pituitary // hypothalamus

11. Regulating hormones from the hypothalamus:

A. enter the venous circulation and travel to the heart that then pumps the hormone-containing blood to the pituitary
B. are delivered directly to the anterior pituitary cells by the hypothalamic neurons
C. travel by arteries to the pituitary
D. first enter into the hypophyseal portal system
E. none of the above

12. During blood vessel injury, the role of the von Willebrand factor is:

A. to initiate platelets adhesion to the exposed collagen fibers
B. to release histamine that causes vasoconstriction of the injured vessel
C. to convert plasminogen to plasmin
D. to initiate release of prostacyclin

13. The pericardial cavity:

A. is another name for the chambers of the heart
B. is a space between the fibrous pericardium and the serous pericardium
C. is the region of the thoracic cavity that contains the heart
D. contains a lubricating fluid called serous fluid

14. Antibodies against both type A and type B antigens are found in the plasma of a person who is blood type:

A. A
B. B
C. AB
D. O
E. Any of these types

15. During a short and powerful exercise lasting about 6 seconds, the main source(s) of energy is (are) ..... stored in muscle cells.

A. ADP and phosphate
B. ATP and phosphocreatine
C. glycogen
D. fatty acids

16. Which of the following is NOT innervated by the autonomic nervous system?

A. sweat glands
B. smooth muscle
C. skeletal muscle
D. cardiac muscle
E. gastric glands

17. When red blood cells wear out, the iron is saved and the heme portion of the hemoglobin molecule is:

A. also saved
B. excreted as bile pigments
C. rearranged into gamma globulins
D. broken down by plasmin
E. used as an anticoagulant

18. The atrioventricular valves open when:

A. the chordae tendineae contract
B. they are stimulated by the AV node
C. ventricular pressure falls below atrial pressure
D. atrial pressure falls below ventricular pressure
E. the papillary muscles contract

19. The mechanism of contraction in smooth muscle parallels that of skeletal muscle in the following ways:

A. Actin and myosin interact by the sliding filament mechanism.
B. The trigger for contraction is a rise in intracellular calcium.
C. ATP energizes the sliding process.
D. All of the above are correct.

20. Which of the following statements is/are TRUE?

A. The blood in the right chambers of the heart has a higher oxygen content than the blood in the left chambers.
B. At the point where intra-arterial pressure surpasses ventricular pressure, semilunar valves open.
C. The normal cardiac cycle does not require direct stimulation by the autonomic nervous system.
D. The pulmonary artery carries oxygenated blood from the lungs to the left atrium.
E. B) and C)

21. From the coronary sinus, blood normally flows into the:

A. aorta
B. pulmonary trunk
C. right atrium
D. left atrium

22. Slow oxidative fibers are said to be "slow" because they:

A. break down acetylcholine slowly
B. conduct action potentials slowly
C. manufacture creatine phosphate slowly
D. recover from fatigue slowly
E. hydrolyze ATP slowly

23. The fossa ovalis is a prominent depression seen in the:

A. wall of the aorta
B. interventricular septum
C. coronary sinus
D. semilunar valves
E. interatrial septum

24. Which of the events below does *not* occur when the semilunar valves are open?

A. Ventricles are in diastole.
B. Blood enters pulmonary arteries and the aorta.
C. AV valves are closed.
D. Ventricles are in systole.

25. Within a physiologic range, an increase in left ventricular end diastolic volume (preload) leads to:

A. an increase in cardiac output and an increased force of contraction
B. a decrease in cardiac output and a decreased force of contraction
C. an increase in cardiac output and a decreased force of contraction
D. a decrease in cardiac output and an increased force of contraction

26. Which of the following cause ONLY the extrinsic pathway of blood coagulation to be followed?

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

27. Normal resting cardiac output for an average adult is approximately:

A. 70ml/min
B. 1 litre/min
C. 2 litres/min
D. 5 litres/min
E. 10 litres/min

28. Which of the following is TRUE regarding hemostasis?

A. Plasmin induces clot formation.
B. Thromboxane A2 is needed for conversion of prothrombin to thrombin.
C. Fibrinolysis is necessary for prevention of blood loss.
D. Thromboxane A2 causes vasoconstriction of the injured blood vessel's smooth muscle.

29. Which of the following statements about smooth muscle is TRUE?

A. Contractions are rapid and forceful.
B. Branching fibers are characteristic.
C. Nuclei are peripherally located in the fibers.
D. Smooth muscle is striated and involuntary.
E. Fibers are small and spindle-shaped.

30. The most abundant plasma protein is:

A. gamma globulin
B. plasminogen
C. albumin
D. fibrin
E. fibrinogen

31. Which of the following describes the means by which blood vessels are kept in a continual state of partial vasoconstriction?

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

32. The endocrine control system that directly responds to changing blood levels of ions and nutrients is:

A. the rapid oxidation of carbohydrates
B. catabolic inhibition
C. protein synthesis
D. humoral stimulation
E. hemo-regulatory mechanism

33. A type of anemia in which hemoglobin molecules assume rod shapes that alter shape of RBCs is:

A. iron-deficiency
B. sickle cell
C. hemorrhagic
D. pernicious

34. Which hormone is NOT secreted by the anterior pituitary gland?

A. GH (growth hormone)
B. ADH (antidiuretic hormone)
C. TSH (thyroid stimulating hormone)
D. FSH (follicle stimulating hormone)
E. ACTH (andrenocorticotropic hormone)

35. As a muscle begins to work, ATP stores are rapidly exhausted. The NEXT energy source tapped by a skeletal muscle fiber would be:

A. glucose via anaerobic glycolysis
B. creatine phosphate to convert ADP to ATP
C. glucose via aerobic respiration
D. all of the above would be tapped at the same time

36. The force of cardiac muscle contraction is influenced primarily by the:

A. intracellular calcium ion availability
B. afterload
C. the parasympathetic nervous system
D. the size of the heart

37. The resting heart in a healthy person is primarily under the control of the ..... nervous system.

A. sympathetic
B. parasympathetic
C. somatic
D. spinal

38. An individual with type B blood can donate to:

A. only type B recipients
B. only type O recipients
C. only type AB recipients
D. both type B and type O recipients
E. both type B and type AB recipients

39. Which of the following is NOT a phase of erythropoiesis?

A. mitosis of reticulocytes
B. production of ribosomes
C. ejection of the nucleus
D. synthesis of hemoglobin molecules
E. all of the above are phases of erythropoiesis

40. Which of the following statements is TRUE?

A. Cardiac muscle has more mitochondria and depends less on a continual supply of oxygen than does skeletal muscle.
B. Tissues damaged by myocardial infarction are replaced by fibrous connective tissue.
C. An ECG tracing provides direct information about heart valve function.
D. The bicuspid (mitral) valve has chordae tendinae but the tricuspid valve does not.

MYO. INF. = complete blockage, heart attack → B

41. The main integration center responsible for the homeostatic balance in the body is:

A. the hypothalamus
B. the anterior pituitary
C. the posterior pituitary
D. the adrenal medulla

42. After erythrocytes have circulated for about 120 days, they are removed by macrophages found chiefly in the:

A. liver
B. spleen
C. appendix
D. bone marrow
E. heart

43. If a patient has a stenosis of the bicuspid (mitral) valve, there is a reduced rate of blood flow:

↳ Abnormal narrowing, Not complete opening vs. valvular insufficiency (not complete closing)

A. from the left ventricle to the aorta
B. from the left atrium into the left ventricle
C. from the inferior vena cava into the right atrium
D. from the right atrium into the right ventricle
E. from the right ventricle into the pulmonary artery

44. Each hemoglobin molecule consists of:

A. a single polypeptide chain plus 4 heme groups
B. 4 polypeptide chains plus a single central heme group
C. 4 polypeptide chains, each of which has a central heme group
D. a single polypeptide chain with a central heme group
E. none of the above

45. Which of the following might trigger erythropoiesis?

Too few RBC's = Too little O_2 → A

A. renal hypoxia
B. an increased number of RBC's
C. moving from a high altitude to a low altitude
D. increased blood pressure
E. A) and C)

46. Which of the following statements is NOT true about the shape, position and location of the heart?

A. The heart is situated obliquely with the base facing the right shoulder.
B. Approximately 2/3 of the heart is found to the left of the midline.
C. The heart is located between the two lungs within the mediastinum.
D. The heart is enclosed in a double-layered sac called the pleural membrane.

47. 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

48. When paying back the oxygen debt:

A. ATP formation requires creatine phosphate
B. muscle cells utilize glycogen reserves
C. lactic acid is formed
D. lactic acid is reconverted to pyruvic acid
E. B) and C)

49. Platelets initially stick to the wall of a damaged blood vessel because:

histamine → inflam. chem. which causes vasodilation

A. exposed collagen fibers make a rough surface to which the platelets are attracted
B. histamine causes vasoconstriction so that platelets can't fit through the opening
C. fibrin threads act like glue to hold them there
D. prothrombinase alters the electrical charge of the vessel wall
E. the intracellular fluid released by damaged cells in the blood vessel wall has a higher viscosity than plasma

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

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

51. Cardiac muscle cells remain depolarized longer than skeletal muscle fibers because:

A. voltage-gated Na+ channels close more quickly to trap Na+ inside longer
B. Ca++ enters the cardiac muscle cells from the extracellular fluid to continue contributing positive charges after the influx of Na+ ions
C. voltage-gated K+ channels open at the same time as Na+ channels, allowing more K+ ions to enter the cardiac muscle cells
D. they are smaller cells, so take longer to repolarize
E. it takes longer to reach threshold, and the duration of depolarization is directly proportional to the time it takes to reach threshold

52. Steroid hormones primarily influence cellular activities by:

A. activating the second messenger cyclic AMP
B. binding to DNA and initiating the transcription of a specific gene
C. using calcium ions as a second messenger
D. changing the permeability of the cell membrane
E. all of the above

53. Smooth muscle fibers:

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

ANP1105 MIDTERM 2

1	B
2	D
3	B
4	D
5	C
6	D
7	D
8	D
9	B
10	D
11	D
12	A
13	D
14	D
15	B
16	C
17	B
18	C
19	D
20	C
21	C
22	E
23	E
24	A
25	A
26	E
27	D
28	D
29	E
30	C
31	A
32	D
33	B
34	B
35	B
36	A
37	B
38	E
39	A
40	B
41	A
42	B
43	B
44	C
45	A
46	D
47	C
48	D
49	A
50	A
51	B
52	B
53	D