STUDENT NAME: ……..……..

STUDENT NUMBER: ……..

University of Ottawa

ANP 1105

Midterm #2

Date: July 8, 2009

Duration: 1 hr 20 min

Instructor: Joanna Komorowski

INSTRUCTIONS:

1. 54 multiple choice questions (1 mark/1 correct answer per question)
2. Please answer the multiple choice questions on the computer sheet that is provided
3. Please **put your name and student number at the top of this page** and at the top of the last two pages. **Please do not forget to put your course code (ANP 1105), your surname (last name) and the initials, on the first page of the scantron sheet!!!**
4. Make sure this exam is complete. This exam contains **10 pages.**
5. The excuse of missing a page will not be accepted after the examination.

Good luck!!!!

1. 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

2. Which of the following characteristics is/are NOT applicable to a fast glycolytic fiber?

    A. slow contraction speed
    B. low resistance to fatigue
    C. rapid firing frequency
    D. glycolysis metabolism
    E. B) and D)

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 fibers.
    C. Most body muscles have a mixture of muscle fiber types.
    D. Genetics can influence the relative distribution of fiber types within muscles.
    E. Paralyzed muscle (no neuronal input) can atrophy by up to 75%.

4. The compound that is stored as an energy reserve for skeletal muscle contraction is:

    A. creatine phosphate
    B. ADP
    C. magnesium phosphate
    D. calcium phosphate
    E. calmodulin

5. 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

6. Muscle tone is:

    A. also called treppe
    B. the felling of well-being following exercise
    C. a state of sustained partial contraction
    D. the condition of athletes after intensive training
    E. none of the above

7. As an axon enters a muscle, it branches into a number of axonal terminals, each of which forms a junction with a single muscle fiber. A neuron and all the muscle fibers it supplies is called a:

    A. synaptic knob
    B. neuromuscular junction
    C. synaptic cleft
    D. motor end plate
    E. motor unit

8. In an isotonic contraction, the muscle:

    A. changes in length and moves the "load"
    B. does not change in length but increases in tension
    C. never converts pyruvate to lactate
    D. rapidly resynthesizes creatine phosphate and ATP
    E. maintains posture

9. The warm-up period required of athletes to bring their muscles to peak performance is:

    A. twitch
    B. wave summation
    C. treppe
    D. incomplete tetanus
    E. none of the above

10. 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.
    E. All of the above statements are true.

11. Holding up the corner of a heavy couch while someone else vacuums under it involves which type(s) of muscle contractions?

    A. tetanic
    B. isotonic
    C. isometric
    D. A) and B)
    E. A) and C)

12. Which muscle type(s) would contain large myoglobin stores?

    A. slow oxidative
    B. fast glycolytic
    C. fast oxidative
    D. A) and B)
    E. A) and C)

13. 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
E. A) and D)

14. 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.

15. Creatine phosphate functions in the muscle cell by:

A. forming a temporary chemical bond with myosin
B. forming a chemical compound with actin
C. inducing a conformational change in the myofilaments
D. storing energy that will be transferred to ADP to resynthesize ATP as needed
E. acting as a calcium-binding protein

16. Smooth muscle is characterized by all of the following EXCEPT:

A. it appears to lack troponin
B. there are more thick filaments than thin filaments
C. there are no sarcomeres
D. there are non-contractile intermediate filaments that attach to dense bodies
E. there are no T-tubules

17. 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)

18. Fused tetanus is:

A. a pathological condition in which stimulation of one muscle triggers contraction of all others in the same motor unit
B. a sustained contraction with partial relaxation between stimuli
C. a sustained contraction in which individual twitches cannot be discerned
D. a brief contraction of all the fibers in a motor unit
E. a phenomenon that occurs in only muscle cells without refractory periods

19. Which of the following substances are used to prevent undesirable clot?

A) Warfarin
B) Heparin
C) Thrombin
D) A and B
E) A and C

20. Which of the following is NOT true about hemophilia?

A) It is a genetic disorder.
B) It is caused by lack of clotting factors.
C) It is caused by the lack of oxygen.
D) Type A Hemophilia is the most common type.

21. Which blood type is called a universal donor?

A) A
B) B
C) AB
D) O

22. Sharon's blood was determined to be AB positive. This means that

A) there are no antibodies to A, to B, or to Rh antigens in her plasma.
B) there are antibodies to A and B present her plasma
C) her blood lacks the Rh antigen.
D) she can only receive blood from a donor who is AB positive.

23. Functions of the blood include all of the following, ***EXCEPT***

A) transport of nutrient and wastes
B) body defense
C) regulation of pH and electrolyte concentration.
D) production of heat

24. Which of the following statements about platelets is ***INCORRECT***?

A) Platelets are fragments of megakaryocytes
B) Their granules contain ions, enzymes and stimulatory factors
C) Their stem cells are erythroblasts
D) They form a temporary plug that helps seal breaks in blood vessels

25. Hemolytic anemia results from

A) excessiveblood loss
B) prematurely ruptured erythrocytes
C) a deficiency of vitamin B_{12}
D) absent or faulty globin chain in hemoglobin
E) inadequate intake of iron

26. Thrombocytopenia is a condition with

A) an increased number of circulating platelets
B) a decreased number of circulating platelets
C) an increased number of red blood cells
D) a decreased number of red blood cells

27. Why is blood doping dangerous? It

A) raises oxygen delivery to all tissues to unnaturally high levels
B) increases blood viscosity
C) increases the blood concentration of white blood cells
D) raises the blood concentration of platelets to unnaturally high levels

28. Which of the following may trigger erythropoiesis?

A) Moving from high altitude to low altitude.
B) Decreased tissue demand for oxygen.
C) Increased number of RBCs.
D) Increased tissue demand for oxygen.

29. Place the following in correct developmental sequence:

1. reticulocyte
2. proerythroblast
3. normoblast
4. late erythroblast

A) 1, 2, 3, 4
B) 1, 3, 2, 4
C) 2, 1, 3, 4
D) 2, 4, 3, 1

30. Which of the following is not a phase of hemostasis?

A) Vascular spasm
B) Fibrinolysis
C) Platelet plug formation
D) Coagulation

31. Which is the correct sequence for the following events?

1. fibrinogen --> fibrin
2. formation of prothrombin activator
3. Intrinsic & extrinsic pathways → Factor X
4. prothrombin --> thrombin

A) 3, 2, 4, 1
B) 1, 2, 3, 4
C) 3, 2, 1, 4

32. Which of the following is true regarding the extrinsic pathway of coagulation?

A) It does not require calcium.
B) It is slower than intrinsic pathway.
C) It involves factors that are present only in the blood.
D) It involves a factor from damaged vascular wall cells known as tissue factor.

33. Which of the following statement is NOT true about blood?

A) Blood has a pH of 7.35 - 7.45
B) Blood accounts for approximately 8% of body weight
C) Blood has a temperature of 37C
D) Average volume of blood is 5–6 L for males, and 4–5 L for females

34. What organ in the body regulates erythrocyte production?

A) Kidney
B) Brain
C) Liver
D) Pancreas

35. One molecule of hemoglobin

A) can transport 2 oxygen molecules because globin has two alpha chains
B) can transport 1 oxygen molecule because heme contains one iron atom
C) can transport 4 oxygen molecules because it contains 4 heme group
D) can transport 1 oxygen molecule because each iron atom of the heme can bind one oxygen

36. Which of the following is NOT found in platelet granules?

A) Serotonin
B) ADP
C) Collagen
D) Calcium

37. The majority of the iron in the body is found

A) as hemosiderin
B) as ferritin
C) as transferrin
D) in the liver
E) in hemoglobin

38. Homeostasis is the condition in which the body maintains _____.

A) the lowest possible energy usage
B) a relatively stable internal environment, within limits
C) a static state with no deviation from preset points
D) a dynamic state within an unlimited range

39. Which of the following statements is TRUE concerning feedback mechanisms?

A) Positive feedback mechanisms always result in excessive damage to the host
B) Negative feedback mechanisms tend to increase the original stimulus.
C) Negative feedback mechanisms work to prevent sudden severe changes within the body
D) Blood glucose levels are regulated by positive feedback mechanisms.

40. The nervous system has three overlapping functions. Which of the following represents a logical sequence of these three functions?

A) Sensory input, motor output, integration
B) Motor output, integration, sensory input
C) Sensory input, integration, motor output
D) Integration, sensory input, motor output

41. While studying for an exam, you reach for a beverage. To extend your arm, your _____ nervous system is activated.

A) afferent
B) autonomic
C) sympathetic
D) somatic

42. Erection of the penis or clitoris _____

A) is primarily under sympathetic control
B) is primarily under parasympathetic control
C) is the result of coordinated activation by both sympathetic and parasympathetic input
D) depends very little on autonomic activation

43. Several hormones act via a mechanism which includes adenylate cyclase. This enzyme

A) acts as a receptor for the hormone
B) activates protein kinase
C) activates protein G
D) catalyzes the formation of cyclic AMP
E) catalyzes the formation of IP3

44. In order for a hormone to activate a target cell, the target cell must possess _____.

A) a receptor
B) a second messenger
C) the hormone
D) a chaperone

45. All somatic neurons and all _____ release acetylcholine.

A) postganglionic fibers of the parasympathetic division
B) preganglionic fibers of the parasympathetic division
C) preganglionic fibers of the autonomic nervous system
D) adrenal fibers

46. One of the endocrine control systems responds to changing blood levels of ions and nutrients. Which of the following describes this mechanism?

A) The rapid oxidation of carbohydrates
B) Hormonal stimulation
C) Protein synthesis
D) Humoral stimulation

47. Which of the following is not a function of the autonomic nervous system?

A) Innervation of smooth muscle of the digestive tract
B) Innervation of skeletal muscle
C) Innervation of cardiac muscle
D) Innervation of glands

48. The neurohypophysis or posterior lobe of the pituitary gland is not a true endocrine gland because

A) it is strictly a part of the neural system and has little or nothing to do with hormonal release
B) embryonically it was an endocrine tissue, but in the adult human it is no longer functional
C) it is unable to function as an endocrine tissue because it is actually part of the neural system due to its location
D) it is only a hormone storage area that receives hormones from the hypothalamus for release

49. The second-messenger mechanism of hormone action operates by _____

A) synthesizing more of the hormone than is actually needed
B) increasing the basal metabolic rate in the target organ
C) not responding to a feedback mechanism
D) binding to specific plasma membrane receptors and employing the services of G proteins, Ca^{2+} and cAMP

50. When an infant suckles at his mother's breast, the mother's neurohypophysis releases oxytocin. This is an example of _____ regulation.

A) humoral
B) neural
C) hormonal
D) negative feedback

51. A major difference between neurotransmitters and hormones is that hormones are secreted _____.

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

52. All of these hormones are secreted by the anterior lobe of the pituitary gland EXCEPT:

A) GH (Growth hormone)
B) TSH (Thyroid stimulating hormone)
C) FSH (Follicle stimulating hormone)
D) TH (thyroid hormone)

53. Receptors for steroid hormones are commonly located _____

A) inside the target cell
B) on the plasma membrane of the target cell
C) in the blood plasma
D) in the extracellular fluid

54. The only amine hormone to act like a steroid is:

A) TH (thyroid hormone)
B) ACTH (adrenocorticotropic hormone)
C) GH (growth hormone)
D) ADH (antidiuretic hormone)