STUDENT NAME: ……..……..

STUDENT NUMBER: ……..

University of Ottawa

ANP 1105C

Midterm #2

Date: November 16, 2010 Duration: 1 hr 20 min

Instructor: Joanna Komorowski

INSTRUCTIONS:

1. **51 multiple choice questions** (1 mark/1 correct answer per question) plus **one comparison question** (2 marks) and **one bonus question** (2 marks).

2. Please answer the multiple choice questions on the on the exam and on the computer sheet that is provided

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4. Please **put your name and student number at the top of this page** and at the top of the final page. **Please do not forget to put your course code (ANP 1105C), your surname (last name) and the initials, on the first page of the scantron sheet!!!**

5. Make sure this exam is complete. This exam contains **11 pages.**

6. The excuse of missing a page will not be accepted after the examination.

Good luck!!!!!

1. **Anterior pituitary hormones include all but one of the following:**

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

2. **An example of a short loop negative feedback control would be:**

   A. regulation of insulin levels by glucose
   B. regulation of blood calcium levels
   C. suppression of LH production by thyroid hormones
   D. suppression of ACTH production by cortisol

3. **The posterior pituitary:**

   A. is the site of ADH storage
   B. is the site of storage of the "hormone of love and trust"
   C. is linked to the hypothalamus via the hypophyseal portal system
   D. both A) and B)
   E. all of the above

4. **Hypersecretion of GH in an adult may produce:**

   A. gigantism
   B. goiter
   C. dwarfism
   D. acromegaly
   E. exophthalmos

5. **Which of the following is TRUE?**

   A. Protein hormones are water soluble and travel in blood in a free form
   B. Thyroid hormone receptors are located on the cellular membrane
   C. Hormone receptors become up-regulated by persistently high levels of a specific hormone
   D. Protein hormones do not require any receptors to exert their effect on DNA and initiate gene transcription

6. **The sympathetic division of the autonomic nervous system:**

   A. Is stimulated during a flight or fight stress response
   B. is concerned with resting and digesting
   C. is responsible for vasoconstriction of most blood vessels
   D. both A) and B)
   E. both A) and C)

7. The integration and regulation centre for the cardiovascular system is the:

A. brain cortex
B. hypothalamus
C. vagus nerve
D. medulla oblongata

8. Insulin secretion can be stimulated by:

A. tropic hormones
B. releasing hormones
C. increasing blood glucose levels
D. decreasing blood glucose levels

9. Which of the following statements is TRUE?

A. Metabolic rate and glucose as well as fat metabolism are regulated by both the sympathetic and parasympathetic nervous system.
B. Under stressful conditions, the sympathetic nervous system dominates over the parasympathetic system.
C. Sympathetic cardiac nerves slow down HR whereas parasympathetic nerves increase it
D. The paraympathetic nervous system has a more widespread effect in the body than does the sympathetic nervous system.

10. Which of the following is TRUE about hormones?

A. Thyroid hormones directly stimulate gene transcription via binding to DNA associated receptors
B. Steroid hormone receptors are located on the cell membrane of target cells
C. All hormones are released from the cells producing them via exocytosis.
D. Protein hormones are carried in blood by albumin

11. Which of the following is TRUE about the autonomic nervous system?

A. The regulatory responses of the autonomic nervous system to homeostatic imbalance are faster than responses of the endocrine system.
B. The parasympathetic nervous system is mobilized during a "fight or flight" situation.
C. The parasympathetic nervous system causes an increase in heart rate and blood pressure.
D. The adrenergic receptors are always stimulatory

12. Steroid hormones influence cellular activities by:

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

13. Choose the TRUE statement about endocrine regulation:

A. Endocrine organs secrete hormones into a series of ducts.
B. Releasing hormones from the hypothalamus are delivered directly to the anterior pituitary cells by hypothalamic neurons.
C. An example of humoral stimulation would be increased secretion of the parathyroid hormone in response to a drop in blood calcium levels levels.
D. Endocrine regulation involves positive feedback to prevent severe changes in the body.

14. Which of the following neurons is most likely to be adrenergic?

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

15. 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 limits.
D. a dynamic state with an unlimited range.

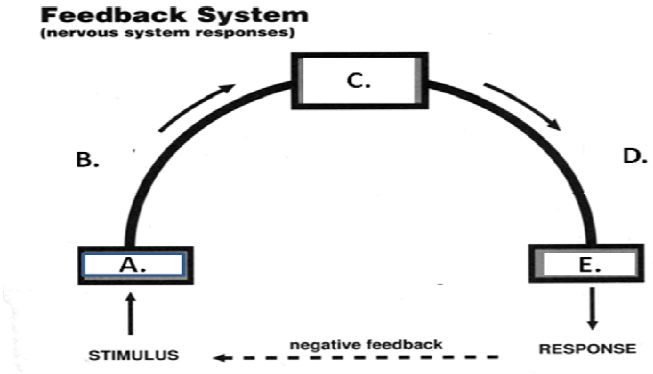
16. Which of the following is true about erythropoetine?

A. Its level increases at high altitudes
B. It induces proliferation of RBCs
C. Its level is regulated in a negative feedback fashion
D. Both A) and B)
E. All of the above

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

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

18. Which of the following (A, B, C, D or E) represents the sensory neuron?



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

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

20. A type of anemia which affects mainly people of the African origin is called……..anemia.

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

21. Which of the following initiates plug formation?

A. Thromboxan A2
B. VonWilebrand factor
C. release of heparin by the liver
D. the conversion of prothrombin to thrombin
E. the release of tissue factor by damaged tissue cells

22. Which of the following statements is TRUE?

A. Lack of the coagullation factor VIII is the main cause of sickle cell anemia.
B. Hemophilia A and B are the hereditary disorders affecting both men and women
C. Thalassemia is a hereditary disorder affecting structure of the hem part of hemoglobin.
D. Polycythemia vera is a cancer of blood characterized by a high number of RBCs.

23. The hormones needed to stimulate tropic hormones production and release are synthesized in the:

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

24. Which of the following might trigger erythropoiesis?

A. decreased tissue demand for oxygen
B. polycythemia
C. moving from a high altitude to a low altitude
D. climbing the Himalaya mountains
E. kidney failure

25. Which of the following is used in blood vessels for the dissolution of fibrin clot?

A. thrombin
B. plasmin
C. heparin
D. antitrypsin
E. vonWillebrand factor

26. Sylvie has a platelet count of 70,000 per microliter of blood. Which of the following statements is TRUE about Sylvie's platelets count?

A. it is normal
B. it indicates thrombocytosis
C. it indicates thrombocytopenia
D. none of the above

27. Macrocytic, megaloblastic anemia has been associated with:

A. lack of any animal products in the diet
B. lack of any green vegetables in the diet
C. lack of iron in the diet
D. Both A) and B)
E. all of the above

28. During blood vessel injury, the role of the thrombin is:

A. to release histamine that causes vasoconstriction of the injured vessel
B. to convert plasminogen to plasmin
C. to activate the clotting factor X and initiate the clotting cascade
D. to initiate release of prostacyclin

29. Which of the following statements is true?

A. The pluripotent red bone marrow stem cells that acquired the erythropoietin receptors can be stimulated by erythropoietin to become the RBCs
B. The pluripotent red bone marrow stem cells that acquired the thrombopoetin receptors can be stimulated by thrombopoetin to become the platelets
C. When folic acid is missing from the diet, RBCs become abnormally small and elongated
D. Both A) and B)
E. All of the above

30. Which of the following statements is FALSE?

A. The only complete cells in blood are leukocytes.
B. Platelets and mature RBCs do not contain nuclei
C. The heme portion of the hemoglobin molecule is capable of binding CO2.
D. Blood is considered a type of connective tissue.

31. Select the correct statement regarding RBCs:

A. each RBC contains about 250 million haemoglobin molecules
B. the main sites of RBCs formation are the spleen and the liver
C. RBCs live around 120 days
D. Both A) and C) are true
E. Both B) and C) are true

32. After erythrocytes become old and rigid, they are removed by macrophages found chiefly in the spleen. Which of the haemoglobin breakdown products is removed from the body?

A. Iron
B. Bilirubin
C. Ferritin
D. Amino acids
E. All of them

33. Which of the following is true about anemia?

A. Iron deficiency without anemia is characterized by low ferritin but normal Hb levels
B. Iron deficiency with anemia is characterized by high hematocrit
C. Sports anemia is characterized by low RBC count and can be cured by iron supplements
D. Pernicious anemia is due to low iron content in the diet

34. 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 through a smaller valve
D. pump blood with greater pressure and against greater resistance

35. Compared to skeletal muscle, cardiac muscle:

A. has desmosomes that prevent cell separation
B. lacks striations
C. has more nuclei per cell
D. cells are larger than skeletal muscle cells

36. The papillary muscles function to:

A. close the semilunar valves
B. prevent backward expulsion of the atrioventricular valves
C. close the atrioventricular valves
D. prevent backward expulsion of the semilunar valves
E. all of the above

37. Untreated strep throat can lead to calcification of the bicuspid (mitral) valve and regurgiration of blood from:

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

38. Leon, age 22, is admitted to the cardiac unit with a diagnosis of pericarditis. He asks you, the nurse, to explain where the pericardium is. You tell him that the pericardium is:

A. the outermost muscular layer of the heart
B. the innermost lining of the heart
C. the thick muscular layer of the heart that provides pumping action
D. a double-walled membranous sac that encloses the heart

39. Foramen ovale:

A. connects the two atria in the fetal heart
B. is a condition in which the heart valves do not completely close
C. is a shallow depression in the interventricular septum
D. is a connection between the pulmonary trunk and the aorta in the fetus

40. Chose a correct order of blood flow, starting at the superior vena cava: 1) left atrium, 2) right atrium, 3) left ventricle, 4) pulmonary artery, 5) aorta 6) right ventricle

A. 1, 3, 4, 2, 6, 5
B. 2, 6, 4, 1, 3, 5
C. 2, 1, 6, 3, 4, 6

41. Oxygenated blood flows through the:

A. superior vena cava
B. pulmonary veins
C. pulmonary artery
D. coronary veins

42. The coronary sinus empties into the:

A. right atrium
B. left atrium
C. right ventricle
D. left ventricle

43. Cardiac muscle cells remain depolarized longer than skeletal muscle fibres 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

44. The cardiac electrical impulse normally begins spontaneously in the SA node because:

A. of its superior location in the right atrium
B. it is the only area of the heart capable of spontaneous depolarization
C. it has rich sympathetic innervation via the vagus nerve
D. it depolarizes more rapidly than other autorhythmic cells of the heart
E. B) and D)

45. The heart in a healthy person during exercise is primarily under the control of the ..... nervous system.

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

46. Normal heart sounds are caused by which of the following events?

A. friction of blood against the chamber walls
B. excitation of the SA node
C. closure of the heart valves
D. opening of fast potassium channels

47. Which of the following is true about the autorhythmic cardiac cells?

A. their depolarization is initiated by the influx of calcium through the leaky channels
B. their auto-rhythm can be modulated by the autonomic nervous system
C. their action potentials have a plateau
D. they have stable resting potentials

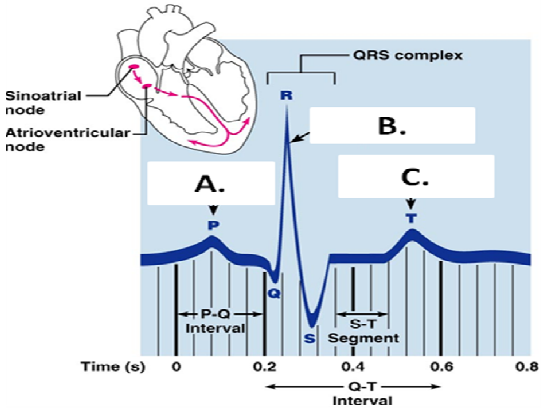
48. When threshold is reached in cardiac pacemaker (autorhythmic) cells, the next event is:

A. opening of fast calcium channels
B. opening of fast sodium channels
C. opening of slow calcium channels
D. opening of slow sodium channels

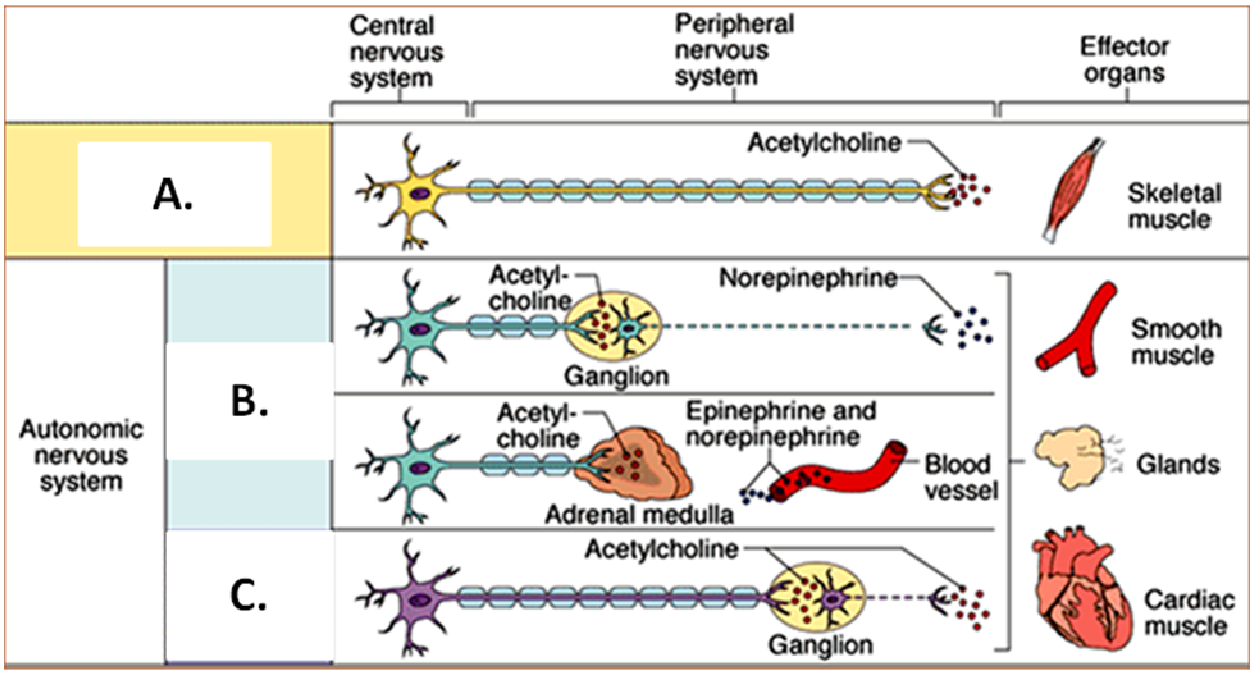
49. The changes in deflection waves of the ECG tracing in a myocardial infarction patient often include:

A. Lack of P wave
B. elevated or depressed Q-S interval
C. smaller than usual Q wave
D. flattened or inverted T wave
E. two T waves

50. Which of the following waves on the EKG (A, B or C) represents atrial contraction?



51. Which of the following (A, B or C) represent the sympathetic stimulation?



52: COMPARE, in a table form, four (4) STRUCTURAL differences between the skeletal and cardiac muscle cells (2 marks)

53. BONUS Question:

Label the following (0.5 mark each label, 2 marks total)