

V1

STUDENT NAME:

STUDENT NUMBER:

University of Ottawa

ANP 1105C

Midterm #2

Date: November 15, 2011

Duration: 1 hr 20 min

Instructor: Joanna Komorowski

INSTRUCTIONS:

1. **43 multiple choice** questions (1 mark/1 correct answer per question) + 1 labelling question (4 marks) + 1 listing question (2 marks and one written (explanation) question, 6 marks).
Total number of marks = **57 + 2 marks bonus**
2. Please answer the multiple choice questions on the computer sheet provided
3. Please put your name and student number at the top of each page of this exam and on the computer sheet.
4. Make sure this exam is complete. This exam contains **11 pages**.
5. The excuse of missing a page will not be accepted after the examination

Good luck!!!!

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1. Which of the following is true about hormonal receptors?

- A. Receptors become down-regulated by persistently low levels of a specific hormone
- B. Receptors become up-regulated by persistently high levels of a specific hormone
- C. Steroid hormones do not require any receptors to exert their effect on DNA and initiate gene transcription
- D. Steroid hormone receptors are located on the cellular membrane
- E. Binding of peptide hormones to their receptors leads to production of second messengers

2. Which of the following is FALSE?

- A. Protein hormones are water soluble
- B. The parasympathetic nervous system is activated during a "flight or fight" situation
- C. Secretion of GH increases at night and during exercise
- D. Half-life of hormones released to blood is usually between a few minutes and a few hours
- E. Most of the effects of the parasympathetic and sympathetic nervous system are opposite

3. Which of the following hormones is regulated in a positive feedback manner during breastfeeding and child delivery?

- A. cortisol
- B. growth hormone
- C. thyroxine
- D. estrogen
- E. oxytocin

4. Which of the following hormones are produced by the hypothalamus?

- A. GH, prolactin, CRH and LHRH
- B. LHRH, GHRH, oxytocin and ADH (vasopressin)
- C. Somatomedin, somatostatin and GHRH
- D. TSH, CRH, oxytocin and ADH (vasopressin)

5. Which of the following IS NOT regulated by the parasympathetic nervous system?

- A. Elimination of urine and feces
- B. Decreased heart beat
- C. Shunting of blood from one area of the body to another
- D. Defecation

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6. Which of the following is true?

- A. Release of one hormone cannot stimulate release of another hormone
- B. Release of epinephrine and norepinephrine (catecholamines) from the adrenal medulla is stimulated by the somatic nervous system
- C. Release of insulin is stimulated by increasing blood glucose levels and release of glucagon is stimulated by decreasing blood glucose levels
- D. TSH stimulates release of TRF from the hypothalamus

7. All _____ release acetylcholine

- A. preganglionic neurons of the autonomic nervous system
- B. postganglionic neurons of the parasympathetic division of the autonomic nervous system
- C. postganglionic neurons of the sympathetic division of the autonomic nervous system
- D. both A) and B)
- E. both A) and C)

8. Which of the following is true about hormones?

- A. Cells of the anterior pituitary produce releasing hormones (factors)
- B. Steroid hormones require protein carriers for their transport in blood
- C. Production of somatomedin C (IGF-1) by the liver is stimulated by GHRH
- D. Release of hormones is most often regulated via a positive feedback mechanism
- E. All hormones produced in hypothalamus are transported to anterior and posterior pituitary gland via the portal veins

9. 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

10. bind to the receptors located in the nucleus and activate.....

- A. steroid hormones; enzymes
- B. thyroid hormones; gene transcription
- C. some of the protein hormones; gene transcription
- D. all hormones; protein synthesis

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11. Homeostatic balance in the body is maintained by:

- A. the endocrine system
- B. the autonomic nervous system
- C. the somatic nervous systems
- D. both A) and B)
- E. all of the above

12. Which of the following statements is **NOT TRUE** about GH?

- A. Excessive production of GH in children leads to gigantism
- B. GH increases uptake of amino acids and protein synthesis
- C. GH production increases with age
- D. Chronically elevated levels of GH may lead to insulin resistance
- E. GH increases fat metabolism

13. Which of the following is true about the autonomic nervous system?

- A. preganglionic axons of the ANS are myelinated
- B. The ganglia of the SNS are usually located within the visceral organs
- C. The PNS plays an important role in the regulation of carbohydrate and fat metabolism
- D. All of the SNS receptors are stimulatory
- E. The PNS can shunt blood from the gastrointestinal system to skeletal muscle

14. You have just discovered that your pants were unzipped the entire time you gave a speech to your class. Which of the following responses would you most likely experience?

- A. Increased sympathetic stimulation to the heart
- B. Increased parasympathetic stimulation to the heart
- C. Increased parasympathetic stimulation to the stomach
- D. Decreased blood pressure due to vasodilation in blood vessels

15. Choose a correct order of events leading to release, action and feedback inhibition of the GH secretion from the anterior pituitary:

1. release of the GHRH
2. release of IGF-1
3. release of GH
4. release of somatostatin
5. effect on most target tissues

- A) 3, 1, 2, 4, 5
- B) 1, 3, 2, 5, 4
- C) 4, 1, 3, 2, 5

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16. The postganglionic motor neurons of the SNS:

- A. Release norepinephrine (NE) that binds to the muscarinic receptors
- B. Release acetylcholine (ACh) that binds to the nicotinic cholinergic receptors
- C. Release norepinephrine (NE) that binds to the adrenergic α - or β -receptors
- D. Are short and myelinated

17. All of the following characterize ANS, EXCEPT:

- A. two neuron efferent chain
- B. innervation of the heart muscle
- C. presence of nerve cell bodies in ganglia
- D. involuntary stimulation
- E. two neuron afferent chain

18. Which of the following statements is true?

- A. Platelets have nuclei but do not contain other organelles
- B. RBC's occupy about 35% of a total blood volume
- C. The number of RBC's is higher in females than in males
- D. Reticulocytes are immature RBCs

19. Select the correct statement regarding RBCs:

- A. hemoglobin is made up of two α - and two β -globin chains
- B. each RBC contains about 500 million hemoglobin molecules
- C. spleen is the main site of RBCs formation in adults
- D. each iron atom combines reversibly with one molecule of CO₂

20. Which of the following is true?

- A. Thalassemia is a hereditary disorder affecting formation of the hem part of hemoglobin
- B. "Sports anemia" can be treated by iron supplements
- C. Chemotherapy may lead to anemia
- D. Lysis of blood clots is initiated 2-3 months after blood clot formation

21. Which of the following is true about the RBCs?

- A. Mature RBCs divide in response to hypoxia
- B. When pluripotent stem cells in red bone marrow develop receptors for erythropoietin, they become committed to differentiate into RBCs
- C. RBCs colour depends on the number of RBCs per unit of blood
- D. Production of RBCs stops at low altitudes

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22. Sophie has a platelet count of 400,000 per microliter of blood. Which of the following statements is true about Sophie's platelets count?

- A. It indicates thrombocytosis
- B. It indicates thrombocytopenia and increased chance of bleeding
- C. It is normal
- D. It indicates hemophilia

23. Which of the following is true about the sickle cell anemia:

- A. it is a hereditary disease affecting people of African origin
- B. sickling of the RBCs is promoted by hypoxia
- C. treatment of the sickle cell anemia involves exercise at high altitudes
- D. Both A) and B)
- E. All of the above

24. Which of the following is NOT TRUE about hemostasis?

- A. Thrombin induces clot lysis (dissolution)
- B. Conversion of prothrombin to thrombin requires calcium
- C. Fibrinolysis is conducted by plasmin and heparin
- D. Thromboxane A₂ released from platelets initiates vasoconstriction of an injured blood vessel

25. Hematocrit of a person with polycythemia is:

- A. 34-37%
- B. 37-47%
- C. 45-50%
- D. >50%

26. During blood vessel injury, the role of the von Willbrand factor is to:

- A. initiate platelet plug formation
- B. release histamine that causes vasoconstriction of the injured vessel
- C. convert plasminogen to fibrin
- D. initiate release of prostacyclin

27. Which of the following is true?

- A. Hemophilia A and B are rare clotting disorders affecting both males and females
- B. Only males can be carriers of haemophilia A and B
- C. The function of intrinsic factor is to aid in absorption of vitamin B₁₂ in the small intestine
- D. β -Thalassemia can be treated by iron supplements

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28. Mr. Pixel from Montreal, age 20, just came back from Peru where he lived for 10 months. Which of the following represents his adaptation to high altitude?

- A. Increased number of all blood cells
- B. Increased number of red blood cells
- C. Increased number of platelets
- D. Decreased number of RBCs

29. Which of the following statements is true?

- A. When ferritin levels in the body increase, transferrin levels increase as well
- B. Plasmin converts soluble fibrinogen into insoluble fibrin
- C. Ferritin is stored in skeletal muscle fibres
- D. When ferritin levels in the body decrease, transferrin levels increase

30. Type 0 is considered the theoretical universal:

- A. recipient , because there are no A or B isoantigens on RBCs
- B. donor, because there are no A or B isoantigens on RBCs
- C. recipient because there are no anti-A or anti-B antibodies in plasma
- D. donor, because there are no anti-A or anti-B antibodies in plasma

31. Mrs. Fix, age 40, became severely dehydrated during her cross-country training. Which of the following is (are) likely to be increased per unit of her blood?

- A. White blood cells count
- B. Platelets count
- C. Red blood cells count
- D. All of the above

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

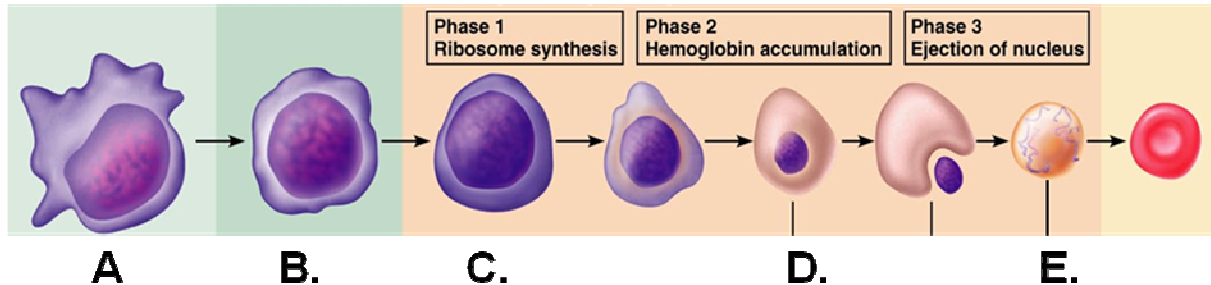
- A. Production of ribosomes
- B. Mitosis of reticulocytes
- C. Ejection of the nucleus
- D. Synthesis of hemoglobin molecules
- E. All of the above are phases of erythropoiesis

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33. When red blood cells wear out:

- A. iron is saved and the rest of hemoglobin molecule is excreted from the body
- B. all of the breakdown products of hemoglobin are excreted from the body
- C. all of the hemoglobin breakdown products are saved in the body
- D. hemoglobin is converted to bilirubin
- E. iron and amino acids are saved and the remainder of hemoglobin is excreted from the body

34. Which of the following (A, B, C, D, or E) represents the normoblast?



35. Blood tests of a vegan student, not taking any vitamin or mineral supplements, may reveal a presence of.....indicative of.....

- A. small and pale red blood cells; folate deficiency
- B. small and pale red blood cells; iron deficiency
- C. large, immature red blood cells; vitamin K deficiency
- D. increased number of all blood cells; iron deficiency

36. Gap junctions in cardiac muscle:

- A. provide the mechanism by which all of the cardiac muscle cells can contract as a functional unit
- B. separate sarcomers from each other
- C. generate the appropriate neurotransmitters to regulate heart rate
- D. store ATP

37. The serous membrane covering the heart is called the:

- A. mediastinum
- B. endocardium
- C. myocardium
- D. pericardium

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38. Oxygenated blood flows to the heart through the:

- A. superior vena cava
- B. pulmonary arteries
- C. pulmonary veins
- D. pulmonary trunk

39. The function of the chordae tendinae is to :

- A. pull the walls of the ventricles inward during contraction
- B. prevent blood backflow to the atria during ventricular contraction
- C. open the semilunar valves
- D. open the AV valves

40. The left ventricular wall of the heart is thicker than the right ventricular wall because it has to:

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

41. Alfred had an untreated strep throat that led to calcification of his heart's bicuspid (mitral) valve. Now, he suffers from a reduced rate of blood flow:

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

42. Which of the following is true about the coronary circulation?

- A. The coronary arteries provide an intermittent, pulsating blood flow to the myocardium
- B. The coronary circulation arises from the base of aorta
- C. The coronary veins join together in the coronary sinus which empties the blood to the right atrium
- D. Both B) and C)
- E. All of the above

43. Foramen ovale:

- A. persists through the lifetime of a person
- B. is the opening between the ventricles during the fetal life
- C. If not closed at birth, may lead to thrombosis
- D. none of the above

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44. COMPARE, in a table form, four (4) FUNCTIONAL DIFFERENCES between the cardiac and skeletal muscle (0.5 mark for each of the characteristics in a comparison); 4 marks total).

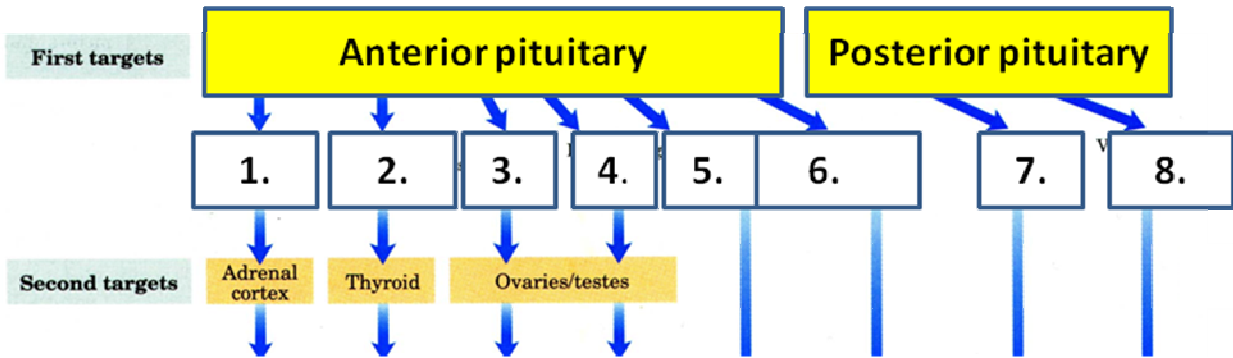
45. Please define and explain the physiological role of three (3) of the following (2 marks for each correct explanation, 6 marks total possible):

1. Homeostasis
2. Autocrine stimulation
3. Platelets
4. Semilunar valves

SEE THE NEXT PAGE!!!!

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46. Please name the following hormones (1, 2, 3, 4, 5, 6, 7, 8) (0.5 mark per label; 4 marks total)



BONUS :

Please label the following (A, B, C, D) (0.5 mark each label, 2 marks total)

