

V2

STUDENT NAME:

STUDENT NUMBER:

University of Ottawa

ANP 1105A

Midterm #2

Date: November 14, 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 = **55 + 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 **12 pages**.
5. The excuse of missing a page will not be accepted after the examination

Good luck!!!!

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1. 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
2. Which of the following is the “hormone of love”?
 - A. growth hormone
 - B. TSH
 - C. cortisol
 - D. testosterone
 - E. oxytocin
3. Which of the following hormones are produced and stored in the hypothalamus?
 - A. TSH and CRH
 - B. Oxitocin and ADH
 - C. GH and prolactin
 - D. LHRH and GHRH
 - E. Oxitocin and ACTH
4. Which of the following IS NOT regulated by the sympathetic nervous system?
 - A. Shunting of blood from one area of the body to another
 - B. Elimination of urine and feces
 - C. Innervations of the adrenal medulla
 - D. thermoregulatory responses to heat
5. Which of the following is true?
 - A. Release of insulin is stimulated by increasing blood glucose levels and release of PTH (parathyroid hormone) is stimulated by decreasing blood plasma levels of calcium
 - B. Release of one hormone cannot stimulate release of another hormone
 - C. TSH stimulates release of TRF from the hypothalamus
 - D. The paracrine stimulation involves binding of the hormone released by a specific cell to the receptors on the same cell

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

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

7. Homeostatic balance in the body is maintained by:

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

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

- A. Receptors become down-regulated by persistently high 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

9. Which of the following is true about hormones?

- A. Thyroid hormones require protein carriers for their transport in blood
- B. Cells of the anterior pituitary produce releasing hormones (factors)
- 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 blood

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

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

11. Which of the following is true about the autonomic nervous system (ANS)?

- A. The SNS plays an important role in the regulation of carbohydrate and fat metabolism
- B. The preganglionic axons of the PNS are not myelinated
- C. The ganglia of the SNS are usually located within the visceral organs
- D. All of the SNS receptors are stimulatory
- E. The PNS can shunt blood from the gastrointestinal system to skeletal muscle

12. Which of the following is FALSE about hormones?

- A. Secretion of GH increases at night and during exercise
- B. Half-life of hormones released to blood is usually between a few minutes to hours
- C. Most of the effects of the parasympathetic and sympathetic nervous system are opposite
- D. Peptide hormones are lipid soluble and thus easily cross cellular membranes

13. 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

14. 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. 4, 1, 3, 2, 5
 - C. 1, 3, 2, 5, 4

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

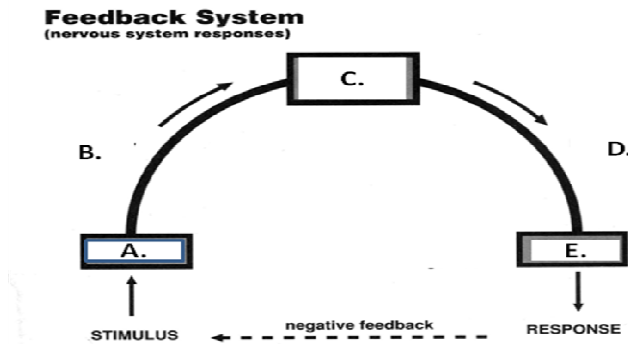
- A. Excessive production of GH in children leads to gigantism
- B. GH increases uptake of amino acids and protein synthesis
- C. GH decreases fat metabolism
- D. GH production decreases with age
- E. Chronically elevated levels of GH may lead to insulin resistance

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16. All of the following characterize ANS, EXCEPT:

- A. Voluntary stimulation
- B. Two neuron efferent chain
- C. Control of smooth muscle contraction
- D. Presence of nerve cell bodies in ganglia

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



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

- A. Mature RBCs divide in response to hypoxia
- B. RBCs colour depends on the number of RBCs per unit of blood
- C. Structure and shape of RBCs reflect adaptation of these cells to carry oxygen and squeeze through narrow capillaries
- D. Production of RBCs stops at high altitudes due to decreased partial pressure of oxygen and decreased [roduction of erythropoietin

19. Which of the following is true?

- A. Lysis of blood clots is initiated 2-3 months after blood clot formation
- B. internal bleeding does not lead to anemia
- C. Thallasemia is a disorder of blood clotting
- D. "Sports anemia" reflects dilution of the RBCs by expanded blood plasma

20. Select the correct statement regarding RBCs:

- A. each RBC contains about 100 million hemoglobin molecules
- B. spleen is the main site of RBCs formation in adults
- C. each iron atom can combine reversibly with one molecule of CO₂
- D. old and damaged RBCs are degraded by macrophages located in lymph nodes
- E. hemoglobin is made up of four globin subunits, each bound to the red heme pigment

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21. 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

22. Which of the following is true about hemostasis?

- A. Plasmin induces clot formation
- B. Conversion of prothrombin to thrombin requires plasminogen activator
- C. Fibrinolysis is necessary for prevention of blood loss
- D. Thromboxane A₂ released from platelets initiates vasoconstriction of the injured blood vessel

23. John has a platelet count of 250,000 per microliter of blood. Which of the following statements is true about his platelets count?

- A. It is normal
- B. It indicates thrombocytosis
- C. It indicates thrombocytopenia and increased chance of bleeding
- D. None of the above

24. Sickle cell anemia is an inherited disorder of red blood cells seen in people of African origin. Which of the following can increase episodes of sickling and lead to signs and symptoms of the disease?

- A. Dehydration
- B. Infections
- C. Cold exposure
- D. All of the above

25. A normal hematocrit in a healthy male is:

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

26. 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. β -Thalassemia can be treated by iron supplements
- D. Calcium is required for blood clotting

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27. 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

28. Microcytic anemia is most often related to:

- A. lack of vitamin B12 in the diet
- B. lack of any green vegetables in the diet
- C. Lack of iron in the diet
- D. A) and B)
- E. All of the above

29. 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

30. 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

31. Blood tests of a vegan patient, 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; | vitamin B12 deficiency |
| C. large, immature red blood cells; | vitamin B12 deficiency |
| D. increased number of all blood cells; | iron deficiency |

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32. Mrs Cohen from Ottawa, age 30, just came back from Nepal where she lived for 5 months. Which of the following represents her adaptation to high altitude?

- A. Increased number of all blood cells
- B. Increased number of red blood cells**
- C. Increased number of platelets
- D. Both A) and C)
- E. Both B) and C)

33. Which of the following statements is true?

- A. Lack of the coagulation factor VIII is the main cause of thalassemia
- B. When ferritin levels in the body decrease, transferrin levels decrease as well
- C. Plasmin converts soluble fibrinogen into insoluble fibrin
- D. A second exposure to Rh⁻ blood will result in a typical transfusion reaction**

34. 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

35. Which of the following is true about the cardiac muscle?

- A. Cardiac muscle cells quickly die in the absence of oxygen**
- B. Cardiac muscle cells contain a few mitochondria because they do not require oxygen for energy production
- C. Cardiac muscle does not require intracellular calcium for contraction
- D. Ligaments and tendons anchor the cardiac muscle cells to the chest cavity

36. Anna had an untreated strep throat that led to calcification of her heart's mitral valve. Now, she 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

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37. Foramen ovale:

- A. persists through the lifetime of a person
- B. is the opening between the ventricles during the fetal life
- C. closes at birth in most children
- D. none of the above

38. The function of the intercalated discs in cardiac muscle is to:

- A. prevent separation of cells and help with synchronized activity
- B. separate sarcomers from each other
- C. generate the appropriate neurotransmitters to regulate heart rate
- D. store ATP

39. Which of the following lists the elements of the heart's conduction system in the correct order?

There are two identical answers but they are not correct

- A. SA node, AV bundle, bundle branches, AV node, Purkinje fibres
- B. SA node, AV node, AV bundle, bundle branches, Purkinje fibres
- C. SA node, AV bundle, bundle branches, AV node, Purkinje fibres
- D. AV node, AV bundle, SA node, bundle branches, Purkinje fibres

40. The endocardium is:

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

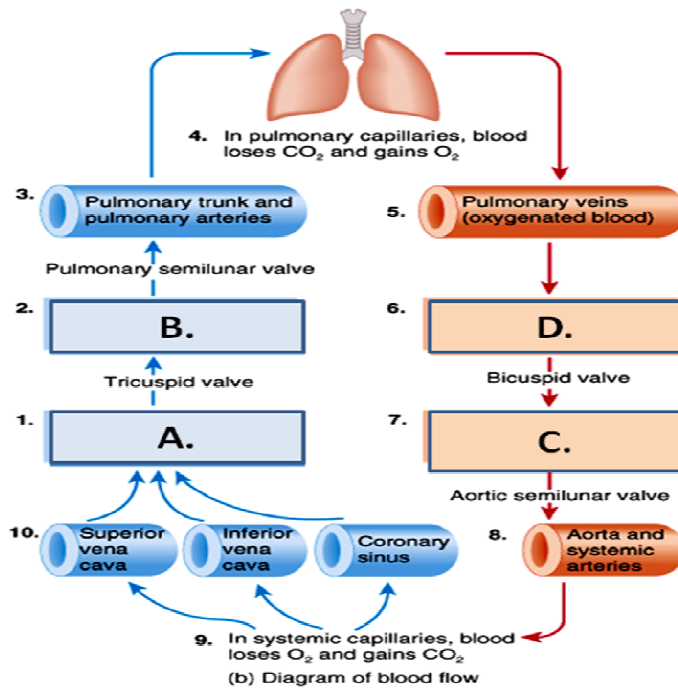
41. Oxygenated blood flows to the heart through the:

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

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

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

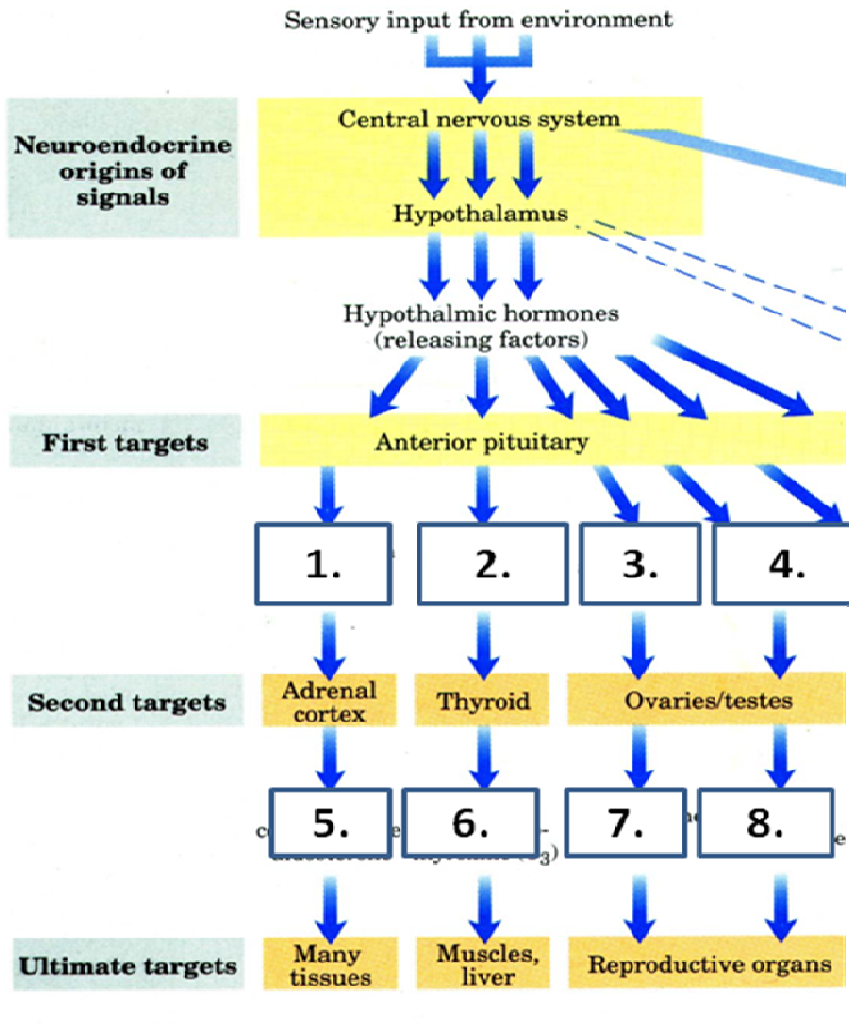
43. Which of the following (A, B, C or D) represents the right atrium?



44. COMPARE, in a table form, four (4) STRUCTURAL DIFFERENCES between the cardiac and skeletal muscle (0.5 mark each comparison; 2 marks total).

PLEASE SEE THE FOLLOWING PAGE!!!!!!

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



SEE NEXT PAGE!!

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

1. Platelets
2. Homeostasis
3. Hemostasis
4. The atrioventricular valves of the heart

BONUS QUESTION:

How will destruction of the SA node affect the functioning of the heart? (2 marks possible)