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 **11 pages.**

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

Good luck!!!!!

1. **Which of the following is the "stress hormone"?**

   A. cortisol
   B. growth hormone
   C. TSH
   D. testosterone
   E. oxytocin

2. **Which of the following hormones are produced by the hypothalamus but stored in the posterior pituitary?**

   A. LHRH and GHRH
   B. TSH and CRH
   C. Oxitocin and ADH
   D. GH and prolactin
   E. Oxitocin and ACTH

3. **Which of the following <u>IS NOT</u> regulated by the parasympathetic nervous system?**

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

4. **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

5. **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

6. Which of the following is true about hormones?

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

7. 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 sympathetic nervous system
C. Release of insulin is stimulated by decreasing blood glucose levels and release of PTH (parathyroid hormone) is stimulated by increasing blood plasma levels of calcium
D. TSH stimulates release of TRF from the hypothalamus

8. 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

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. Which of the following is <u>FALSE</u> about hormones?

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

11. ..... 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

12. Which of the following is true about the autonomic nervous system (SNS)?

A. The preganglionic axons of the PNS are not myelinated
B. The ganglia of the SNS are usually located within the visceral organs
C. The SNS 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

13. 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

14. Which of the following statements is <u>NOT TRUE</u> 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 decreases with age
D. Chronically elevated levels of GH may lead to insulin resistance
E. GH decreases fat metabolism

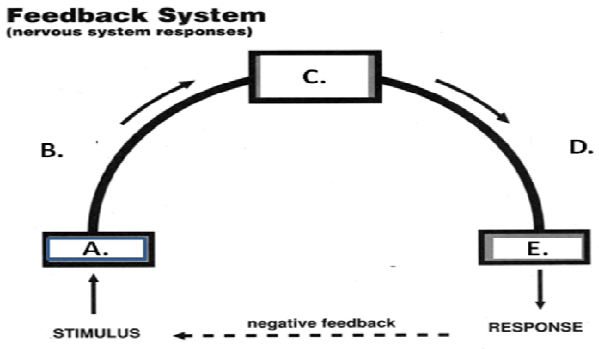
15. The postganglionic motor neurons of the SNS:

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

16. All of the following characterize ANS, EXCEPT:

A. Two neuron efferent chain
B. Innervation of skeletal muscle
C. Presence of nerve cell bodies in ganglia
D. Involuntary stimulation

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



18. Select the correct statement regarding RBCs: **No correct answer (1 point given to students)**

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 CO_2
D. old and damaged RBCs are degraded by macrophages of spleen, liver and bone marrow
E. hemoglobin is made up of six globin subunits, each bound to the red heme pigment

19. Which of the following is true?

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

20. 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

21. 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. When pluripotent stem cells in red bone marrow develop receptors for erythropoietin, they become committed to differentiate into RBCs
D. Production of RBCs stops at low altitudes

22. Maria has a platelet count of 900,000 per microliter of blood. Which of the following statements is true about Maria's platelets count?

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

23. Which of the following is true about hemostasis?

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

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

27. Macrocytic, megaloblastic anemia may be 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

28. Mr. Spock from Ottawa, age 30, just came back from Peru where he lived for 5 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 level of erythropoietin
D. Both A) and C)
E. Both B) and C)

29. 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 increase
C. Plasmin converts soluble fibrinogen into insoluble fibrin
D. A first exposure to Rh^+ blood will result in a typical transfusion reaction

30. 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

31. 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

32. 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. Both the extrinsic and intrinsic pathways lead to activation of factor X and blood clotting
D. β-Thalassemia can be treated by iron supplements

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 biirubin
E. iron and amino acids are saved and the reminder of hemoglobin is excreted from the body

34. 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 deficincy
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

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

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

36. 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

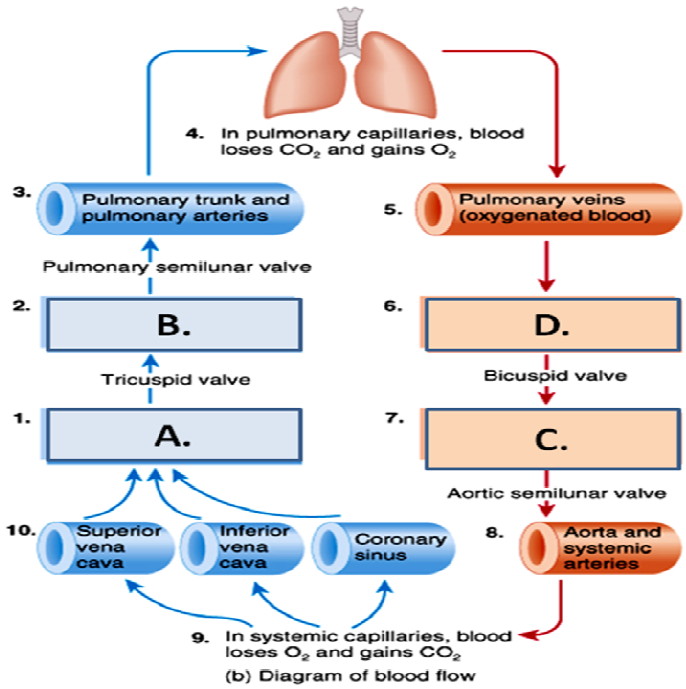
37. Which of the following lists the elements of the heart's conduction system in the correct order?
Both A and C are identical but they are not a correct answer

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

38. **Oxygenated blood flows to the heart through the:**

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

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



(b) Diagram of blood flow

40. 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

41. Mark 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 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

42. Which of the following is *NOT* a difference between cardiac and skeletal muscle?

A. Cardiac muscle cells contain more mitochondria then do skeletal muscle cells
B. Cardiac muscle does not use sliding filament mechanism of contraction, skeletal muscle does
C. Cardiac muscle cells quickly die in the absence of oxygen, skeletal muscle cells are able to adapt to oxygen deficiency
D. The plasma membrane of cardiac muscle cells interlock, but skeletal muscle fibres are independent

43. Foramen ovale:

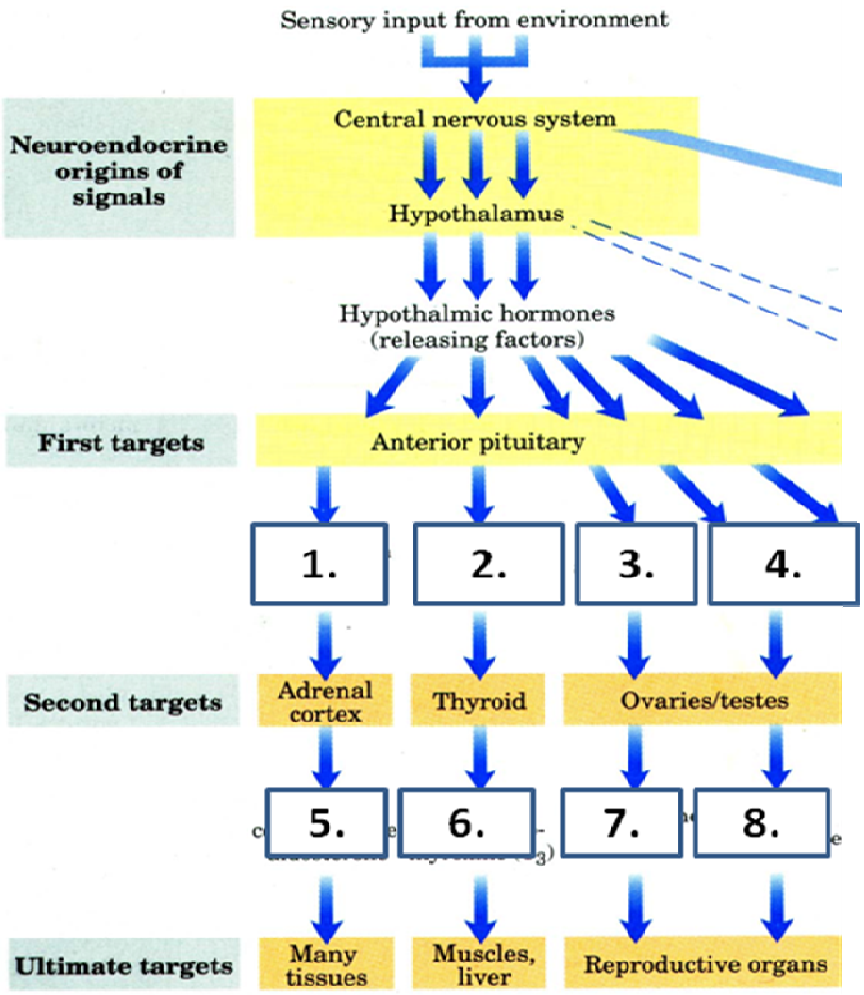
A. Closes at birth
B. Persists through the lifetime of a person
C. Is the opening between the ventricles during the fetal life
D. None of the above

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

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

1. **Erythropoietin**
2. **Plasmin**
3. **Hemostasis**
4. **The autorhytmic cells of the heart**

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



BONUS QUESTION:

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