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SID: _____

Physiology of Human Development (MCB 135E)

MIDTERM 2
November 8, 2006

Name: _____ _____

SID: _____ _____

Points Received

Part I: Multiple Choice (30 points)

Part II: True and False (20 points) 46

Part III: Short Answer (50 points)

48.5 +49

SCORE

95

Name: _____
SID: _____

Physiology of Human Development

Midterm 2
November 8, 2006.

I. Multiple choice questions (30 points, 2 points each correct answer) There is only one correct answer.

1. The major hormones of delivery are involved with the following events:
   A. Dilation of the cervix and secretion of relaxin
   B. Expulsion of the fetus and uterine contractions under the influence of oxytocin
   C. Expulsion of the placenta may be helped by injection of pitocin
   √ D. All of the above
   E. None of the above

2. The following are characteristics of hypothyroidism, ***EXCEPT***
   A. Protruding tongue
   B. Thick skin (myxedema)
   C. Weight Loss
   D. High LDL Cholesterol
   E. High Metabolism

3. Which is **TRUE** of brown fat cells?
   A. Store triglyceride
   B. Generate heat
   C. Diminish with age
   D. Are the major components of non-shivering thermogenesis
   ✓ E. All of the above

4. Which of the following statements are ***INCORRECT*** about the gastrointestinal system?
   ✓ A. Production of bile by the small intestine for the digestion of lipids.
   B. Hydrochloric acid activates pepsin for the digestion of proteins in the stomach
   C. The size of the stomach increases until adulthood, and then decreases around 70 years of age
   D. Is regulated by paracrine hormones
   E. None of the above

5. Which are the characteristics of jaundice?
   A. Jaundice may happen during the first week of life.
   B. It may result from high levels of bilirubin in the blood
   C. It occurs if there is an increased red blood cell destruction
   D. B and C
   ✓ E. All of the above

Name: _____

SID: _____

6. Common causes of increased risk for the newborn **INCLUDE**:
   A. Fetal distress
   B. Meconium Aspiration
   C. Blood poisoning
   D. Congenital Anomalies
   E. All of the above

7. Which of the following is ***TRUE*** about the kidney?
   A. Secretes rennin when there is low blood flow to the kidneys
   B. All the nephrons are functional at the same time
   C. The loop of Henle is shorter in the newborn than in the adult, increasing the of dehydration in the newborn
   D. ~~B & C~~ A, C
   E. All of the above

8. With respect to the infant nutrition, survival depends on:
   A. The mother's ability to breast feed or availability of non-maternal milk
   B. The baby's ability to suck
   C. The baby's good development of the gastrointestinal function
   D. The appropriate levels of maternal prolactin and oxytocin
   E. All of the above

9. Of the following statements, which are ***TRUE***?
   A. The second peak of post-natal accelerated growth is dependent, in part, on sex hormones
   B. Optimal growth reflects how healthy other systems of the body are
   C. The first peak of growth occurs in the 4^{th} prenatal month when the placenta is largest and most effective
   D. The second peak of accelerated growth occurs at puberty
   E. All of the above

10. Which of the following statements are true of the Pygmies ***EXCEPT***:
    A. Have very low levels of IGF-1
    B. Have normal levels of GH
    C. Have normal levels of IGF-2
    D. Are usually deficient in protein
    E. Have well proportioned bodies

11. Indicate which of the following is ***TRUE*** with respect to the following disorders.
    A. Acromegaly occurs when there is an excess of GH in adulthood
    B. Dwarfism is more common than gigantism
    C. There is protein deficiency in Kwashiorkor
    D. The stomach can become distended in Marasmus since the malnourished children are more prone to GI infections
    E. All of the above

Name: _____ __ ___
SID: _____

12. Risk factors for dehydration in infants and young children are due to various conditions operating at various levels. They include the following, EXCEPT
    A. Greater water loss from the skin
    B. Diarrhea from the gastro-intestinal tract
    C. Difficulty for water reabsorption by the immature kidney
    D. Excess secretion of anti-diuretic hormone (ADH)
    E. Reduced production of urea from the liver

13. Which of the following factors affect growth?
    A. Genetics
    B. Hormonal Activity
    C. Stress
    D. A & B
    E. All of the above

14. Which of the following factors does not reduce IGF1 secretion?
    A. Cortisol
    B. Growth Hormone
    C. Deficiency in proteins
    D. Large dose of estrogens
    E. Diabetes

15. Which of the following is correct about kernicturus?
    A. Occurs only when the mother is Rh- and fetus is Rh+
    B. Leads to jaundice if the bile levels are increased in blood and tissues
    C. Leads to destruction of the red blood cells
    D. All of the above
    E. None of the above

II. (20 Points total) True or False (In the SCANTRON, True is **A**, False is **B**).

16. The Fetal Distress Syndrome is due to lack or insufficient surfactant

17. The levels of estrogen and progesterone increase throughout pregnancy but levels of progesterone decrease when close to delivery (around 7 months).

18. The release of cortisol from the adrenal cortex initiates uterine contractions.

19. Hypoxia can occur if too much pitocin is administered during labor

20. Newborns increase cardiac output by increasing heart rate and contractility

Name: _____
SID: _____

2. The degree of oxygenation of the fetus is a key factor in his/her neonatal survival. Below is a list of the structures/function concerned with the oxygenation of the fetus. Indicate the corresponding structures in the newborn. (10 points, 2 points each)

10

Prenatal Structure	Postnatal Structure
A) Uterine Artery	A) Airways / Bronchi
B) Placental Sinusoids	B) Air sacs / alveoli
C) Umbilical Vein	C) Pulmonary Vein
D) Umbilical Artery	D) pulmonary artery
E) Maternal Myocardium	E) Diaphragm

3. The most important hormones for total post-natal body growth include the following three hormones. Indicate the type of chemical structure, from where they are secreted, and 2 major actions. (12 points, 1 point for each answer)

10.5

NAME	Type of Chemical Structure	Site of Secretion	2 Major Actions (1 point for each)
A) Growth Hormone	Protein	from anterior pituitary	1) Growth of the muscle and bone ✓ 2) Chondrogenesis / proliferation of epyphisial cartilage. ✓
B) Thyroid Hormone	protein -1	From Thyroid gland ✓ (under the influence of TSH from Pituitary and TRH from hypothalamus)	1) Body growth ✓ 2) Development of nervous system. ✓ 3) increase in O_2 consumption in all tissues.
C) Parathyroid Hormone	Protein -.5	Parathyroid glands (which are located in the posterior part of thyroid gland)	1) it increases the Ca^{2+} concentration ✓ 2) it increases the rate of bone reabsorption by stimulating osteoclast ✓ 3) stimulate intestine to reabsorb calcium.

20.5

Name: _____ _

SID: _____ _____

4. List 4 types of dwarfism and indicate their cause(s)
(8 points, 2 points each)

A) dwarfism due to endocrine system which could be due to { 1- hypopituitarism; 2) hypothyroidism; 3) hypercorticoidism; 4) hypocorticoidism.

B) dwarfism due to hypoxia because O_2 is not enough for the proper metabolic functions.

C) dwarfism due to psychological disorder → because glucocorticoid are secreted in huge amount at the expense of GH hormone.

+8

D) dwarfism due to environmental factors example lack of nutrients which means the person is not receiving enough nutritional material to boost its metabolic activity

5. An appropriate acid-base balance is necessary for health and survival.
A. Explain what do we mean by acid-base balance; B. How the pH is maintained around a value of 7.4 and C. Indicate which are the two major systems /functions of the body the regulate the pH and briefly explain how they do it (10 points, 3 points A & B each and 4 points C)

A) Acid-base balance are important regulatory functions (mechanisms) that maintain the pH of the blood and urine around a particular number for blood is 7.4 and urine is 5. (in each) and this is a vital function for the survival of an organism because in body specific protein and chemical structure are active at a particular optimal pH.

+3

B) the maintaine of the pH is done by different action: in kidney: H^+ is secreted in to the proximal tubules and in distal tubules the bicarbonate HCO_3 joins H_2CO_3 which dissociates into H^+ and HCO_3^-, the HCO_3^- is reabsorbed in to the body and leaves the H^+ in to the kidney tubules which raises the pH of the body but lowers the pH of the urine 2) and also different buffers are used such as phosphate to stabilize the pH 3) NH_4 is secreted in to the distal tubule other

+3

C) Two major systems that are involved in this process are kidney and lungs. as I mentioned above kidney regulate the pH by the excretion of the H^+ in to tubules for the exchange of Na^+, and bicarbonate (HCO_3^-) is reabsorbed in to the body. presence of buffers as well as secretion of ammonia (NH_4)

+3 Lung also helps to regulate the pH by regulating the depth and rate of respiration added amount of the CO_2 that is exhaled. for instance by increasing the rate of respiration, they decrease the amount of CO_2, thus increasing the pH. and also H^+ secretion and bicarbonate reabsorption).

18