Name_____

MCB 135E, Fall 1994
2nd Midterm

I. In the following multiple choice questions, only one answer is correct. **CIRCLE** the correct answer. Each correct answer, 3 points.

1. Which of the cells listed below can process and present antigen?
   a. Plasma cells
   b. B-cells
   c. T-killer cells
   d. T-helper cells
   e. Neutrophils

2. When does the thymus gland reach its maximum weight?
   a. At birth
   b. At puberty
   c. At 6 months gestation
   d. During adulthood
   e. At age 30

3. Which of the following is false?
   a. T-lymphocytes can be observed in the thymus as early as 7 weeks gestation.
   b. All lymphocytes, natural killer cells, and macrophages are derived from stem cells.
   c. Ig G is the first immunoglobulin to reach adult levels in a newborn.
   d. Ig G can cross the placenta.
   e. Ig A is responsible for allergic reactions

4. Which of the following is false?
   a. T-helper cells have abilities to activate B-cells
   b. Complement can lyse cells to which antibody is bound.
   c. Macrophages can secrete interleukin I
   d. Macrophages will often display antigen along with MHC I
   e. T-killer cells can destroy a virally infected normal cell

5. Which of the following is false?
   a. At about 6 weeks gestation some complement proteins are detected
   b. At 16 weeks gestation lymphocytes can be observed in the spleen
   c. T-helper cells have a CD4 receptor
   d. Natural killer cells have a CD8 receptor
   e. T-helper cells can secrete interleukin II

6. Mammary gland development and lactation in humans require the participation of the following hormones:
   a. Prolactin
   b. Cortisol
   c. Estrogen
   d. Growth hormone
   e. All of the above

7. Oxytocin is not, does not
   a. a typical neural hormone
   b. stored in the posterior lobe of the pituitary gland
   c. induce milk production in the mammary gland
   d. stimulate uterine contractions
   e. activated by reflex mechanisms

8. A newborn weighing 2500 gm or less
   a. may be premature
   b. may be "small for date"
   c. may have a low Apgar score
   d. may be subject to infections
   e. all of the above

9. The respiratory distress syndrome is due to :
   a. weakness of respiratory muscles
   b. delayed development of medullary respiratory centers
   c. lack or low levels of surfactant
   d. failure of closure of foramen ovale at birth
   e. none of the above

10. At birth, changes in circulatory pressures (compared to the fetus) involve:
   a. increased pressure in the pulmonary circulation
   b. decreased pressure in the left compared to the right atrium
   c. increased blood flow from the pulmonary artery to the aorta in the ductus arteriosus
   d. increased pressure in the left as compared to the right atrium and ventricle
   e. none of the above

11. The single major (most frequent) cause of death in newborns is
   a. malformations
   b. abnormal pulmonary respiration
   c. infections
   d. injuries at birth
   e. maternal diabetes

12. In humans, the first phase of labor is characterized by:
a. the dilation and effacement of the cervix
b. an increased secretion of relaxin
c. the descent of the infant
d. the expulsion of the placenta
e. a) and b)

13. Which of the following hormones exerts the least effect on growth?
a. Growth hormone
b. Testosterone
c. T4
d. Insulin
e. ADH

14. Which of the following are <u>incorrectly</u> paired?
a. T3 neonatal deficiency : cretinism
b. pituitary anterior lobe: growth hormone
c. Laron dwarfism: tissue resistance to growth hormone
d. African pygmies ; low plasma growth hormone
e. acromegaly: high plasma IGF concentration

II. In questions 15 to 20 circle whether the first item is greater (G) the same (S) or less (L) than the second item. Each correct answer, 3 points

15. Plasma growth hormone level during slow-wave sleep is

G S L

Plasma growth hormone level during the wake period

16. The production of urea by the liver in the adult is

G S L

The production of urea by the liver in the child

17. The renal capacity of concentrating urine in adults is

G S L

The renal capacity of concentrating urine in children

18. The danger of dehydration due to gastrointestinal infections in children is

G S L

The danger of dehydration due to gastrointestinal infections in adults

19. The capacity of oxytocin to stimulate contraction of the pregnant uterus is

G S L

The capacity of oxytocin to stimulate contraction of the non-pregnant uterus

20. In the infant, the detoxifying function of the liver towards exogenous and endogenous substances is

G S L

Than the liver detoxifying function in the adult

III. (10 points) Hypoxia is one of the potentially most damaging conditions for the newborn.
Compare three (3) causes and consequences of hypoxia in the premature and the full-term(normal expected body-weight) neonate:

	Etiology(causes)	**Consequences**
In the premature neonate:		
In the full-term, normal expected weight neonate		

IV. (10 points). Draw the curve for height gain (i.e. increments in height from year to year)in humans from birth (O) to 18 years of age

V. True and false questions. Circle **T** or **F** as appropriate . Each correct answer, 2 points

T. F. The loop of Henle is longer in infants than in adults

T. F. The urinary excretion of a water load is more rapid in the adult than in the infant

T. F. The brown fat tissue supports thermoregulation in the infant

T. F. IGF-1, IGF-2 are structurally related to insulin

T. F. Relaxin is the ovarian hormone that relaxes the pubic ligaments at delivery

T. F. Insulin is secreted by the pancreatic B cells and by the liver

T, F, Growth is characterized by a prevalence of anabolic over catabolic processes

T. F. Polymorphism of a population is due to allometric growth , i.e. differences in rate of growth at discrete stages of development, both within the species and among species.

T. F. Maternal deprivation is not an important factor regulating growth

T. F. Gigantism and dwarfism are characterized by short and tall stature, respectively

V. Fill in the blank. Each correct answer, 2 points

1. The first milk that is secreted is called _____, which is particularly rich in proteins and fats.

2. A hemolytic disease of newborn or _____ is characterized by an abnormal destruction of RBCs.

3. _____ and _____ cells are derived from stem cells which are totipotent.

4. _____ are stimulated by interferons and destroy cancer cells.

5. The level of surfactant is regulated by many factors, including _____, the hormone of the adrenal gland and by _____.

6. _____ centers in the newborn brain are stimulated by accumulation of high levels of CO_2 during delivery.

7. _____, is a special type of adipose tissue that helps the infant to maintain thermoregulation.

8. Renin is secreted by _____ cells, special groups of cells close to the glomerulus.

9. Renin acts on various proteins in blood to produce _____, which is further transformed to _____.

10. _____ is the last stage of fetal maturation of the kidney.