Name _____ Student I.D. Number _____

MCB 135E, Second Midterm
November 10, 1995
Version A

Answer Key

Three (3) points per question

1. Surfactant lining the pulmonary alveoli:
   A. Helps prevent alveolar collapse
   B. Is decreased in hyaline membrane (respiratory distress) disease
   C. Is a mixture of proteins and lipids
   D. Is necessary at birth to facilitate the first breath
   E. All of the above

2. In the newborn and infant, the frequency of feeding (meals) is required because:
   A. The shorter intestine
   B. The smaller stomach
   C. The lack of teeth
   D. The maturity of the liver
   E. All of the above

3. In the newborn and infant, thermoregulation is assisted by:
   A. Shivering
   B. Sweating
   C. Voluntary muscle activity
   D. Presence of brown fat depots
   E. Increased pulmonary ventilation

4. In the newborn and infant, dehydration is one of the major risk factors threatening survival because:
   A. Intestinal wall irritability accelerates evacuation of feces which induces diarrhea
   B. Loop of Henle in kidney is shorter than in adult
   C. Amount of urea in renal medulla is less than in adult as proteins are utilized for growth
   D. All of the above
   E. None of the above

5. The most important cardiovascular adjustments at birth include:
   A. Increased blood pressure in the lungs
   B. Changes in pressure & strength of cardiac muscle with increase in left heart and decrease in right heart
   C. Dilation of ductus arteriosus
   D. Closure of portal vein
   E. Decreased number of renal glomeruli

6. The probability that careful examination late in life will reveal one or more birth defects in an individual is:
   A. Zero
   B. One in Four
   C. One in Seven
   D. One in Fourteen
   E. One in Twenty

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7 Which of the following is false?
A. Ig G can cross the placenta.
B. Ig G is the predominant immunoglobulin in adult blood.
C. Ig M is the predominant immunoglobulin in blood at birth.
D. Ig D is the largest immunoglobulin.
E. Ig A is relatively stable to adverse conditions.

8. Which of the following is false?
A. B-cells are found mostly in the spleen.
B. T-cells are derived from stem cells.
C. The macrophage is a phagocytic lymphocyte.
D. Neutrophils can destroy some antibody antigen complex.
E. T-killer cells can destroy cells infected with virus and are responsible for cell mediated immunity.

9. Which of the following is false?
A. The T helper cell contains a receptor called T-cell receptor that interacts with MHC II-antigen complexes.
B. The T helper cell contains a receptor called CD-4 that interacts with MHC II.
C. The T-helper cell contains a receptor called CD 28.
D. The B-cell acquires an MHC II receptor upon antigen processing and presentation.
E. The T killer cell displays an MHC II receptor associated with antigen.

10. Which of the following is false?
A. Ig A is responsible for allergies.
B. The thymus reaches its largest size at puberty.
C. The spleen is developed by 16 weeks gestation.
D. The thymus reaches maximal weight/body weight at birth.
E. Complement factors are observable before birth.

11. Which of the following is false?
A. Complement can lyse membranes where antigens are associated to antibodies of the Ig G type.
B. Natural killer cells can potentially destroy cancer cells.
C. Thymocytes mature in the thymus.
D. T-helper cells can potentially activate B-cells.
E. B-cells produce high quantities of antibodies before maturing into plasma cells.

12. Jaundice is a symptom of accumulation of bilirubin in blood and tissues. In the newborn, benign jaundice is transitory and most often it is caused by:
A. Excess production of bilirubin due to increased destruction of red blood cells and conversion of hemoglobin to bilirubin
B. Decreased uptake of bilirubin in hepatic cells
C. Hepatic cirrhosis
D. Hepatic carcinoma
E. Gallbladder stones

13. Give three causes of dwarfism GH deficieny

Undernutrion

Genetic

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Number of points in parenthesis

14. (6 points) The most common "Inborn Error of Metabolism" in humans is PKU
It occurs approximately once per 15,000 live births and causes irreversible brain damage unless newborn is placed on phenylalaniner low or phenylalanine-free diett

15. (10 points) Classify the following birth defects with respect to their likely origin (GENETIC, ENVIRONMENTAL, or MULTIFACTORIAL):

A. Sickle Cell Anemia: Genetic

B. Congenital Hypothyroidism: Environmental

C. Huntington's Chorea: Genetic

D. Severe Combined Immuno-Deficiency: Genetic

E. Anencephaly: Multifactorial

16. (6 points) Teratogens are most likely to exert their detrimental effects between the 3rd and 8th weeks of human development, because during this critical period actively replicating cells are` present as major organ system development begins

17. (12 points) Describe the roles of estrogen, progesterone, oxytocin and prostaglandins in parturition. Discuss how one hormone affects another.

estrogen (2)1. inhibits local action of progesterone
promotes unterine sensitivity to stimulatory prostaglandins and oxytocin (via increase in number of oxytocin receptors)
promotes uterine contractility
promotes cervical softening

progesterone(2) reduces uterine contractility due to:
supression of stimulatory prostaglandins
reduction of gap junction due to reduced connexin aggregation

oxytocin(4) stimulates uterine contractions
directly as manifesated by increased amplitude of muscle contraction waves and indirectly by markeldy increased production of stimulatory prostaglandins (which in turn stimulate muscle contractions)

prostaglandins (4) are necessary for onset and progression of labor
They: stimulate smoth muscle contraction
They increase signal propagation that leads to increased contractility by stimulating aggregation of connexin, a gap junction protein that promotes formation of gap junctions (i.e. increased gates of channels between cells)

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18 (15 points) Draw and label a curve of human postnatal growth. Use growth rate in height from birth to end of adolescence.

19 (12 points) Draw and label a curve of postnatal growth rate in weight and compare growth in the following organs: thymus, brain, uterus, heart