

參考用

Short answer and Essay Questions (total 100%):

1. From the following polynucleotide sequence, please answer the following questions: (10%)
ACCAGTCG
 - (a) The base found at the 3' end of the molecule is
 - (b) Which nucleotide contains a free 3' hydroxyl group
 - (c) Which nucleotide contains a free 5' phosphate group
 - (d) Complementary DNA sequence from 5' to 3' is
 - (e) Complementary RNA sequence from 5' to 3' is
2. A number of human genetic defects of sphingolipid metabolism because sphingolipids are important in nervous tissues, why? (5%)
3. What is the major difference between B-DNA and A-DNA? (5%)
4. What is ribozyme? (5%)
5. Which of the following amino acids can undergo an oxidation reaction to form a disulfide bond? (5%)
6. In animals, all the nitrogen of heme groups is derived from which amino acid? (5%)
7. The reactions of the urea cycle occur in two different cellular compartments. Which urea cycles intermediates must be transported across the inner mitochondrial membrane? (6%)
8. Which pathway takes place primarily within the inner mitochondrial membrane? (5%)
9. If concentration of ATP is increased, the overall rate of the citric acid cycle is increased or decreased and why? (10%)
10. What is the final product of glycolysis? How is this product used in beer brewing or biofuel production? (10%)
11. When DNA replicates, one strand is discontinuously synthesized (lagging strand). Which enzymes are involved in the synthesis of the lagging strand and how? (10%)
12. Eukaryotic Chromosomes are linear. What is specialized structure in the end of chromosomes? The chromosome end shortening is one theory of aging. Which enzyme can prevent the end shortening and how? Why is the prevention of the end shortening related to development of cancer cells? (15%)
13. What are the functions of EF-Tu, EF-Ts and EF-G in the translation? (9%)

