

科目：生物化學與分子生物學(300E)

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1. If a protein isoelectric point is known, how to know its electric charge? (5%)
2. What is the reason that proteins tend to be least soluble at their isoelectric point? (10%)
3. What are the three amino acids that absorb UV light? (6%)
4. Which non-covalent interaction does NaCl interfere?(5%) Which non-covalent interaction does a detergent interfere?(5%)
5. What are the functions and purpose of SDS for SDS-PAGE? (9%)
6. A solution of low ionic strength will make DNA-hybridization unstable. Please explain the mechanism. (10%)
7. How are the ends of chromosomes replicated? (8%)
8. What are the conserved functions for transcription factors? (8%)
9. Can RNAs regulate the gene? Give an example. (10%)
10. The two strands of DNA double helix can be separated by heating. If you raised the temperature of a solution containing the following three DNA molecules, in what order do you suppose they would "melt" ? Please explain your answer. (7%)
  - a. 5'-CAGAGCTAGATCGAT-3'  
3'-GTCTCGATCTAGCTA-5'
  - b. 5'-GTAATATTTTATAAATCTATGATATAAATGTT-3'  
3'-CATTATAAAATATTTAGATACTATATTTACAA-5'
  - c. 5'-CGCCCGGTCGGGCTCACCCATCGGGTCC-3'  
3'-GCGGGCCAGCCCGAGTGGGTAGCCCAGG-5'
11. What are three stages of catabolism? (9%)
12. What are signal transduction pathways and please give an example.(8%)

