

1. Please describe the formation and structure of micelles and liposomes, and their biological significances. (10%)
2. Please describe the biosynthesis and chemical structure of glutathione and its biological functions. (10%)
3. Please define gluconeogenesis and glycogenolysis, and describe their biological significances. (10%)
4. Why is it logical for the first step in a metabolic sequence of reactions to be the major regulatory step? What is the first regulatory enzyme in TCA cycle and the reaction that is catalyzed by this enzyme in TCA cycle? (10%)
5. Please describe the molecular basis of purifying protein in each of the following chromatographic techniques. (10%)
 - a. Ion-exchange chromatograph.
 - b. Affinity chromatography.
 - c. Gel filtration chromatography.
6. Please describe the general characteristics and biological significances of the DNA double helix. (10%)
7. Please describe the structural differences of prokaryotic and eukaryotic genomes and the biomedical significances of human genome project. (10%)
8. Please describe the formation, molecular structures and biological significances of telomeres, and the molecular mechanisms that are used for maintaining the telomere length. (10%)
9. Please describe the steps involving in posttranscriptional processing an eukaryotic primary messenger RNA, and the main components of a mature eukaryotic mRNA and their functions in protein synthesis. (10%)
10. Please describe details the molecular mechanisms of RNA interference (RNAi) in mammalian systems and its potential applications in medical therapeutics. (10%)