

1. Tools of Biochemistry (10%)
 - 1) RT-PCR
 - 2) site-directed mutagenesis
 - 3) SDS-PAGE
 - 4) Tandem MS
 - 5) GFP
2. Diseases related Biochemistry (10%)
 - 1) Maple syrup urine disease
 - 2) African sleeping sickness
 - 3) Obesity
 - 4) Cystic fibrosis
 - 5) Goat
3. Please draw a double-reciprocal or Lineweaver-Burk plots showing the effect of uncompetitive, competitive and noncompetitive inhibitors compare to uninhibitor on the kinetic of enzyme-catalyzed reactions. (10%)
4. Given two examples for each of Glycoprotein & Glycolipid with their biochemical and physiological functions. (10%)
5. In addition to the roles of information of nucleic acids, Nucleotides have a variety of three other functions of nucleotides in every cell. What are they? (10%)
6. Describe six types of DNA repair systems in *E. coli*. (10%)
7. Describe the roles of SnRNA, SnoRNA and miRNA. (10%)
8. Draw and describe and the path from insulin to GSK3 and glycogen synthase. (10%)
9. Define AKAP proteins and draw two types of AKAP: AKAP79 and AKAP250 in biosignaling. (10%)
10. Discuss the protein fate including their half-life and degradation. (10%)