國立中山大學100學年度碩士班招生考試試題

科目：生物化學【海資系碩士班甲組選考】

Ten (10) points for each question.

1. Please compare the DNA helix and α helix.

2. Please draw the general formula of α-amino acids and the peptide bond of a dipeptide.

3. What is the "chemiosmotic hypothesis" and how energy is generated?

4. Please draw the tricarboxylic acid (TCA) or Kreb's cycle with key intermediates and mark the steps where high energy compounds are synthesized.

5. Please write the Michaelis-Menten Equation and explain the meaning and unit of each symbol.

6. Please explain the competitive, noncompetitive and uncompetive inhibitors of an enzyme.

7. Under anaerobic conditions, the yeast can only make 2 ATP's from a molecule of glucose. Please explain why and how the yeast does biochemically to correct the situation of lacking NAD^+ ?

8. What are the primary, secondary, tertiary, and quaternary structures of proteins?

9. Please explain the overall regulation of tryptophan synthesis at the DNA and enzyme levels.

10. The following 2 equations are related to ammonium metabolism. Please identify A, B(enzyme), C, D, and E(enzyme).

$$NH4^+ + \underline{\ A\ } + NADPH + H^+ \xrightleftharpoons{B} \text{glutamate} + NADP^+ + H_2O$$

$$\underline{\ C\ } + \underline{\ D\ } + NADPH + H^+ \xrightleftharpoons{E} 2\ \text{glutamate} + NADP^+$$