本試題是否可以使用計算機：□可使用，☑不可使用　（請命題老師勾選）

簡答下列問題，每題十分。所有考題務必在答案卷上作答。

1. Describe the usefulness of each of the following reagents in the analysis of protein structure:

   (A) Sanger reagent (1-fluoro-2,4-dinitrobenzene, FDNB)
   (B) CNBr (cyanogen bromide)

2. How can adding urea to a protein solution destroy the native protein structure?

3. For an enzyme-catalyzed reaction E + S → ES →E + P, what is the relationship between the Michaelis-Menten constant (K_m) and the rate constants? How is K_m determined graphically?

4. In glycoproteins, the carbohydrate moiety is always attached through which amino acid residues?

5. Explain how each of the following is used in recombinant DNA technology: (a) type II restriction endonucleases; (b) DNA polymerase I (E. *coli*).

6. Describe the principle features of the fluid mosaic model of membranes.

7. Describe the biological roles of the following vitamins: (a) Vitamin A; (b) Vitamin K; (c) Vitamin D.

8. What is the difference between ΔG and $\Delta G^{\circ\prime}$ of a chemical reaction?

9. Describe the following terms: (a) simple diffusion; (b) facilitated diffusion; (c) active transport.

10. Describe the metabolic functions of :(a) pentose phosphate pathway; (b) TCA cycle.