國立臺北科技大學 bt 1-1

九十三學年度工程科技研究所博士班入學考試

生物科技組　生物化學試題

填准考證號碼　　第一頁　共一頁

注意事項：

1. 本試題共 8 題，配分共 100 分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在答案卷之答案欄內，否則不予計分。

1. Please write the full name for each of the following terms. (20 points)
   (a) ATP
   (b) cDNA
   (c) pI
   (d) K_M
   (e) tRNA
   (f) Ig
   (g) $NADP^+$
   (h) PCR
   (i) RFLP
   (j) NMR
2. Please give a brief definition for each of the following terms. (20 points)
   (a) turnover number
   (b) allosteric enzymes
   (c) disulfide bond
   (d) Ramachandran plot
   (e) secondary structure
   (f) post-translational modifications
   (g) glycoproteins
   (h) activation energy

(i) competitive inhibitor

(j) catabolism

3. Please answer the following questions. (10 points)
   (a) Please give the full names of three amino acids having aromatic side chains?
   (b) Please draw the structure of an amino acid.
   (c) What is the primary structure of a protein?
   (d) What are the most widely used experimental methods to determine the structures of proteins?
   (e) Membrane proteins are usually classified into two types, please write down the names of these two types of membrane proteins.
4. Polyhistidine is insoluble in water at pH 7.8 but is soluble at pH 5.5. Please explain the observation. Would you expect the polymer to be soluble at pH 10? (10 points)
5. Please outline the hierarchy of protein structural organization. (10 points)
6. In a first order reaction a substrate is converted to product so that 87% of the substrate is converted in 7 min. (a) Calculate the first-order rate constant. (b) In what time would 50% of the substrate be converted to product? (10 points)
7. Please draw the glycolysis pathway, including all the enzymes required for each step in this metabolic pathway. (10 points)
8. Please write down the full name, the three-letter abbreviation, and the one-letter abbreviation for each of the 20 amino acids. (10 points)