※ 考生請注意：本試題不可使用計算機

回答下列問題，所有考題務必在答案卷上作答。

1. Briefly describe the following terms. (25%)
   a. Peptide mass fingerprinting
   b. Heterochromatin
   c. Matrix metalloproteinases
   d. Reporter gene
   e. Amino acid act as a buffer

2. Describe and compare the following terms: (40%)
   a. Transcriptome vs. Functional genomics
   b. Glycoproteins vs. Proteoglycans
   c. Small interfering RNAs (siRNAs) vs. MicroRNAs (miRNAs)
   d. DNA polymerase vs. RNA polymerase
   e. DNA microarray vs. Protein microarray

3. Two polypeptides, A and B, have similar tertiary structures, but A normally exists as a monomer, whereas B exists as a tetramer, B_4. What differences might be expected in the amino acid composition of A versus B? (10%)

4. Breakdown of glycerophospholipids produce some substances that act as powerful chemical signals to initiate a cascade of reactions. Please describe the signaling cascades induced by the hydrolysis of inositol phospholipids catalyzed by phospholipase C. (10%)

5. Describe three techniques can be used to detect the expression level of genes in cells and tissues. Compare their sensitivity and resolution. (15%)