

系所組別： 生物科技研究所甲、乙組

考試科目： 分子生物學

考試日期：0226，節次：1

1. (A) Please describe the differences between ribonucleic acid and deoxyribonucleic acid. (3points)  
(B) Draw a simple diagram to show G, A, T and C four nucleotide structures. (7 points)
2. What is Okazaki fragment and how does it function on DNA replication? (10 points)
3. Please draw a diagram to describe the structure of plasma membrane. (10 points)
4. What is microRNA and how does it work to regulate gene expression? (10 points)
5. Please compare the differences between eukaryotic and prokaryotic mRNAs? (10 points)
6. Please explain the function of *cis* element and that of *trans* factor in regulating transcription by giving two examples at least. (10 points)
7. What's *lac* operon? (10 points)
8. Please explain in detail all protein synthesis steps including translation initiation, elongation and termination. (10 points)
9. What are restriction enzymes and their application in molecular biology? (5 points)
10. Please describe how proteins are tagged and degraded by proteasomes. (10 points)
11. Please briefly define the following terms: (5 points)
  - A) topoisomerase
  - B) signal recognition particle (SRP)
  - C) Wobble hypothesis
  - D) apoptosis
  - E) polycistonic