系所組別： 臨床醫學研究所

考試科目： 分子生物學

考試日期：0223，節次：3

※ 考生請注意：本試題不可使用計算機。 請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. Please briefly describe the following terms.
   (1) Wobble hypothesis (2%)
   (2) Replication fork (2%)
   (3) Dicer (2%)
   (4) Okazaki fragment (2%)
   (5) Epigenetic modification (2%)

2. Please briefly describe the following methods.
   (1) Electrophoretic mobility shift assay (2%)
   (2) ChIP-on-chip (2%)
   (3) Real time PCR (2%)
   (4) Next generation sequencing (2%)
   (5) Transgenic mice (2%)

3. Please describe the mechanisms of DNA repair. (10%)

4. Please describe the mechanisms of translational control. (10%)

5. What is alternative splicing? (5%)
   What is the difference between cis-splicing and trans-splicing? (5%)

6. Please define and describe the regulatory mechanisms of the following terms, microRNA, RNAi, shRNA and lncRNA. (20%)

7. Please describe how transcription is regulated in mammalian cells in detail. (10%)

8. Please give an example of RTK (receptor tyrosine kinase)-mediated signaling pathway and how it affects physiological and pathological functions in mammalian cells. (10%)

9. Please define iPS cells and give an example of their potential application and limitation in human diseases. (10%)