系所組別：微生物及免疫學研究所甲乙丙丁組

考試科目：分子生物學概論 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 describe in detail how DNA is replicated in the cell (15 points).

2. Please describe in detail how protein is translated from mRNA (15 points).

3. Please define the following terms and state their applications
   a. microRNA (5 points)
   b. Cre/lox recombination system (5 points)
   c. Next generation sequencing (5 points)
   d. real-time polymerase chain reaction (5 points)

4. Please describe the function and operation of intracellular vesicle trafficking (15 points).

5. Epidermal Growth Factor Receptor (EGFR) is a receptor tyrosine kinase. Deregulation of its activity leads to the development of several types of cancers, such as breast cancer and lung cancer. If you are a cancer biologist, you aim to target the deregulated EGFR for cancer treatment. How can you develop the strategies for this goal? (15 points).

6. Please describe or define the following terms: (1) Induced pluripotent stem (iPS) cells (5 points); (2) Apoptosis (5 points); (3) Cell cycle (5 points); (4) DNA methylation (5 points).