

※ 注意：請於答案卷上依序作答，並應註明作答之部份及其題號。

**Part I: 簡答題 (50%, 5% each)**

- (1) What is the function of the *E. coli* proteins MreB, PBP2, and RodA ?
- (2) What is the role of the FtsZ protein and the products of *min* genes in bacterial cells ?
- (3) What proteins are involved with the formation of the replication fork at *oriC* ?
- (4) What is the purpose of nick translation as performed by a DNA polymerase ? Describe the process.
- (5) What is the structure of the *E. coli* replicase called DNA polymerase III ?
- (6) What is an episome ?
- (7) What is the function of the RecBCD complex ?
- (8) What system is used for excision repair in *E. coli*, what are its components, and what do they specifically do in the process ?
- (9) When does error-prone DNA synthesis occur in *E. coli* ?
- (10) What is the function of the human NHEJ system ? What is the result of mutations of genes in this system ?

**Part II: 50%**

A. Define and explain the following terms (20%, 4% each)

1. X chromosome inactivation
2. Chromatin Immunoprecipitation (ChIP)
3. Nucleosome
4. Spliceosome
5. Transposon

B. Short essays (30%, 10% each)

1. How does  $\beta$ -galactoside induce transcription of *lac* operon in *E. coli* ?
2. How does Eukaryote transcription initiation complex form in the promoter region ?
3. What are the major processes and regulators of mRNA splicing ?

試題隨卷繳回