

※ 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 (50%)

- (1) Please compare the common components of the priming and replication complex in Prokaryotic and Eukaryotic cells. (20%)
- (2) How to trigger SOS response and repair the DNA during the stress. (15%)
- (3) Describe the following factors required for the eukaryotic growth factor (GF) signal transduction pathway to permit cell cycle progression: RTK, Grb2, SOS, RAS, RAF, MEK, ERK, scaffolding proteins CNK and KSR, Rb/E2F, cyclin/CDK complex. (15%)

Part II (50%)

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

- (1) Epigenetics
- (2) Alternative splicing
- (3) T-DNA
- (4) Imprinting
- (5) Transposon

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

- (1) Describe three different mechanisms for regulating gene expression.
- (2) What are the key steps of Eukaryotic mRNA processing from transcription initiations of pre-mRNA to mature mRNA for translation?
- (3) Describe two techniques to examine a transcription factor binding to promoters. Also, briefly explain how it works.