

# 國立嘉義大學九十四學年度 生物科技研究所碩士班招生考試試題

## 科目：分子生物學

1. Please answer the following questions related to the transcription of genes.
  - a. Why (or how) are genes in the phages (e.g. SPO1) divided into early, middle and late genes? Which protein(s) is/are the key protein(s) for this event? ( 11% )
  - b. Please describe two mechanisms for the termination of transcription in bacteria (e.g. *E. coli*). ( 14% )
2. Please answer the following questions related to the activating transcription.
  - a. Please describe the pathway of how steroids (e.g. glucocorticoid) induce the expression of genes which respond to steroid treatment on cells. ( 15% )
  - b. What are activator and coactivator? What is (are) the difference between activator and coactivator? ( 10% )
3. **Briefly** describe the following mutagenesis terms that are used very frequently in molecular biology. **And** describe the possible effects on the functionality of encoded proteins when these mutations occur in the coding region of a gene. ( 25% )
  - (1) point mutation      (2) frameshift mutation      (3) silence mutation
  - (4) nonsense mutation      (5) missense mutation.
4. Concisely define the following terms: ( 25% )
  - (1) Lariat
  - (2) Open reading frame
  - (3) Alternative splicing
  - (4) Proofreading activity of a DNA polymerase
  - (5) Kozak sequence
  - (6) Codon usage bias
  - (7) Cap 0
  - (8) Photoreactivation
  - (9) Gene conversion
  - (10) Nonreplicative transposition