

※ 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. Explanation (5% of each): 30%

- (1) Polycistron (2) iDNA (3) yeast HO endonuclease (4) MinCDE system  
(5) Cre/loxP system (6) Ubiquitin-mediated protein degradation

Assay: 20%

2. The Nobel Prize in Chemistry 2015 was awarded jointly to Tomas Lindahl, Paul Modrich and Aziz Sanchar "for mechanistic studies of DNA repair". Thus, please describe the molecular machinery of

- (1) Base excision repair (5%)  
(2) Nucleotide excision repair (5%)  
(3) Mismatch repair (10%)

Part II: 50%

3. (1) Describe the characteristics and functions of microRNA. (2) What factors are involved in the formation of microRNA? (10%)

4. (1) What is the epigenetic inheritance? (2) What kinds of modification occurring in DNA and histones may result in epigenetic inheritance? (10%)

5. Describe the structures and functions of proteins with leucine zipper domain and proteins with zinc finger domain. (10%)

6. Describe all the *cis* elements required for an eukaryotic gene to go through transcription and translation. Answers include all the specific sequences in DNA and RNA and their functions. (10%)

7. (1) Describe the structures of bacterial *lac* operon. (2) Describe all the factors and *cis* elements that are involved in the regulation of *lac* operon. (10%)

試題隨卷繳回