※ 注意：請於試卷上依序作答，並應註明作答之部份及其題號。

Part I: 50%

1. Please describe the characteristics of nuclear splicing, group II splicing and group I splicing process; what are the differences among them? (10%)

2. What is epigenetic effect? How many types of epigenetic effects are known thus far? Please give each type of epigenetic effect to describe. (10%)

3. How is the pathway to produce microRNA? What is the regulatory function of microRNA? (10%)

4. Please define the following terms; a. activator, b. repressor, c. enhancer, d. insulator, e. ribozyme. (10%)

5. How to use two restriction enzymes to detect DNA methylation? How to assay the gene activation by use DNaseI? (10%)

Part II: 50%

1. How the FstZ and *minB* locus, *MinCDE*, controls septum formation and localization ?? (8%)

2. Lambda phage has been of major importance in the study of gene regulatory circuitry, in host cells with sufficient nutrients could lead to the lytic lifestyle; in cells with limited nutrients leads to the lysogenic lifestyle. Here, (1) how the λ DNA integrates into bacteria chromosome after infection, and (2) how to establish and maintain it lysogenic cycle, also (3) how the bearing λ prophage is "immune"

見背面

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to be infected by another λ, (4) and how to induce it lytic cycle ?? (12%)

3. When the incubation medium mixed with the Glucose and Lactose, the bacteria uses Glucose at first, it is been known by the regulation the control the *Lac* operon expression, describe it. (2) How Tryptophan controls itself biosynthesis through the leader peptide locates between the operator and the attenuator. (8%)

4. What are the "SOS response" and "Error-prone repair by DNA polymerase V", how the RecA to involve with it ?? (8%)

5. Differentiate between the following types of cells: F^+, F^-, Hfr and F'. (4%)

6. The common component of priming and replication complex in Prokaryotic and Eukaryotic cells, please fill in. (10%)

Function	E. coil	Eukaryote
Helicase	DnaB	1
Loading helicase/primase	2	cdc6
Single strand maintenance	4	RPA
Priming	DnaG	3
Sliding clamp	6	PCNA
Clamp loading (ATPase)	8	RFC
Catalysis	Pol III core	5
Holoenzyme dimerization	10	?
RNA removal	Pol I	7
Ligation	Ligase	9

試題隨卷繳回