

國立中興大學97學年度碩士班招生考試試題

科目：微生物學

所別：食品暨應用生物科技學系甲乙組

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1. Please match the following cellular structures to their functions on the right (12%)

(1)_____ porin	a. motility
(2)_____ lysosomes	b. resistance to physical stresses
(3)_____ cytoskeleton	c. protein synthesis
(4)_____ rough endoplasmic reticulum (ER)	d. passage of molecules
(5)_____ axial filament (endoflagella)	e. respiration for ATP production
(6)_____ mitochondria	f. digestive enzyme storage
2. Please give an example and describe how microorganisms are used in production of the alternative energy sources. (7%)
3. Please describe functions of the following specific cellular components: helper T cells (T_H cells) and cytotoxic T cells (T_C cells). (6%)
4. Define foodborne disease, outbreak, and case (3%) and describe the differences between microbial induced foodborne gastrointestinal infection and intoxication, and give two examples for each, respectively. (9%)
5. Discuss the two types of illness involved in *Bacillus cereus* gastroenteritis (3%) and describe the major differences between food botulism and infant botulism. (4%)
6. Describe the location of O-, H-, and K-antigens on a bacterial cell and explain why they can be used to distinguish different bacterial strains? (6%)
7. Virus H5N1 can be lethal to humans. However, chickens infected with H5N2 are not likely to cause death in human. Why chickens infected with H5N2 are still put to death? (9%)
8. Please explain why cDNA must be made in order to express a human gene in a bacterium. (8%)

背面有題，請繼續作答。

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9. Multiple Choice (Single answer for each question, 4 points each) (8%)

1) In DNA replication, a primer is provided in the form of:

- a. stabilizing proteins.
- b. DNA polymerase.
- c. small strands of RNA.
- d. nucleotide triphosphates.

2.) Assume you isolate, digest, and electrophorese plasmids from two bacteria. If the resulting DNA fingerprints are identical, this proves the:

- a. bacteria are resistant to antibiotics.
- b. bacteria can hydrolyze X-gal.
- c. bacteria are related.
- d. bacteria contain the same plasmid.

10. There are several methods that can be used to examine the foods for the presence, types, and numbers of microorganisms. Please name one method that is suitable for samples that contain low numbers of bacteria. In your answer, please include the name, principal, and procedure of that method. (7%)

11. Why adenosine triphosphate can be applied for estimating microbial numbers? How this can be done? Please describe the principle of this procedure. (6%)

12. Please define GRAS chemical food preservatives and name two of them. (6%)

13. What is modified-atmosphere packaging (MAP)? Please describe the application and the safety of MAP foods. (6%)