

國立臺灣海洋大學一〇二學年度研究所碩士班暨碩士在職專班招生考試試題

考試科目： 微生物學

系所名稱： 食品科學系碩士班生技組

1.答案以橫式由左至右書寫。2.請依題號順序作答。

1. Please define and/or explain the following terms: (24%)
  - 1A. Phage typing and fluorescent in situ hybridization
  - 1B. Mutation and selection
  - 1C. Viruses and prions
  - 1D. Electroporation and protoplast fusion
  - 1E. Bioreactors and biofuels
  - 1F. Bacteria and Archaea
  - 1G. Induction and repression
  - 1H. Biotechnology and DNA technology
2. Please compare the real-time PCR and the reverse-transcription PCR. (6%)
3. Please state and compare the DNA vaccines and live attenuated vaccines. (6%)
4. Please differentiate conjugation, transduction, and transformation. (7%)
5. Please describe and differentiate the following terms: genus, species, culture, clone, and strain. (7%)
6. Please describe the protocols and underlying mechanisms for Gram staining and acid-fast staining. (10%)
7. Please explain why penicillin, a “miracle drug”, does not harm human cells. (10%)
8. Please draw a G(-) bacterial cell structure and indicate the locations where (1) capsule, (2) periplasmic space, (3) ribosome, (4) nucleoid, and (5) peritrichous flagella are. (10%)

**9. Compare and contrast the following items (5% for each)**

**(1) Flagella structures between prokaryote and eukaryote**

**(2) Plasmolysis vs. osmolysis**

**(3) Facilitated diffusion vs. active transport**

**(4) Energy production by fermentation vs. by aerobic respiration in *Escherichia coli***