國立臺灣海洋大學一００學年度研究所碩士班暨碩士在職專班入學考試試題

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: (16%)**
   - **1A. Protoplast fusion**
   - **1B Passive agglutination tests**
   - **1C. Replication fork**
   - **1D. Tooth decay**
   - **1E. Viruses, viroids, and prions**
   - **1F. Dairy fermentations**
   - **1G. Heterocysts**
   - **1H. *Lactobacillus***

2. **Please describe the mechanisms of drug resistance that a microorganism could be developed spontaneously. (8%)**

3. **Please discuss how many kinds of "biofuels" that can be made by microorganisms. (8%)**

4. **Please describe how to do Ames test and what is the principle behind the Ames test. (8%)**

5. **Please state what is "Southern blotting", "RFLPs", and "DNA fingerprinting", and explain their relationship. (10%)**

6. **Describe the use-dilution test for evaluation of the anti-bacterial activity of a disinfectant A against *Staphylococcus aureus* (5%). How do you further differentiate if this disinfectant A is bactericidal or bacteriostatic to *S. aureus* (5%)?**

7. **A yeast strain of *Saccharomyces cerevisiae* is facultative anaerobe. Flask A containing 200 mL glucose- added malt extract broth was inoculated with *S. cerevisiae* to have an initial cell density of 2×10^4 CFU/mL and incubated at 25°C with aeration for 3 days. Flask B contained the same amount of yeast cells in the same medium and incubated anaerobically at 25°C for 3 days. Which culture had greater cell mass? Which culture produced more alcohol? Please answer these questions and give your reasons for your answers (10%).**

8. **Diagram and describe each of the cell wall structures of G(+) and G(-) bacteria (4%). Which cell wall is toxic to human? Why? (2%) Explain why Gram stain works to distinguish between these 2 types of bacteria (4%).**

9. **Compare and contrast: (5% each)**
   - **(a) Homolactics vs. heterolactics**
   - **(b) Aerobic respiration vs. anaerobic respiration**
   - **(c) Photoheterotroph vs. chemoheterotroph**
   - **(d) Flagellum structure of prokaryote vs. flagellum structure of eukaryote**