

系所別:

生命科學系

科目:

微生物學

九十二學年度中央大學生科所

微生物學考題:

問答題: (Total 100 points)

1. You are assigned to find out the causative agent for SARS. Please design experiments to isolate and characterize the virus. Also demonstrate how to identify the family that this virus is belong to. (15 points)

(SARS 臨床特性: 於 2002 年 11 月 1 日 1 之後出現: 發高燒 ($>38^{\circ}\text{C}$) 且咳嗽或呼吸困難 且在發病前 10 天內有以以下一種或一種以上的暴露曾與診斷為 SARS 之個案有密切接觸: (1)曾到過 SARS 病例集中地區; (2) 住在病例集中地區。)

2. You are going to write a research proposal to study the microbial diversity in the seashore after oil leaking from a ship by using 16S rDNA fingerprinting. In this proposal, you also plan to isolate and characterization of the microorganisms capable to degrade petroleum hydrocarbons. Then, you plan to apply the isolate(s) for *in situ* bioremediation. What will the major experiments you will conduct in this proposal to reach the three major goals? (total 25 points; 10 points for microbial diversity analysis; 10 points for the isolation and characterization of petroleum degraders; 5 points for the bioremediation study)

3. Please describe the greatest accomplishment in the area of Microbiology by the following scientists. (4 points each; total 32 points)

- 1) Anton van Leeuwenhoek
- 2) Robert Koch
- 3) Louis Pasteur
- 4) Sergei N. Winogradsky
- 5) Alexander Fleming
- 6) Robert Gallo & Montagnier
- 7) Howard Temin & David Baltimore
- 8) Carl Woese

4. Please give two species (in binomial names) of bacteria that their genomes have been completely sequenced. (4 points)
Describe the impact of microbial genomics and proteomics in basic research in Microbiology as well as in anti-microbial drug discovery, new vaccine development and diagnostics. (10 points)

5. If glucose contains radioactivity in carbon atoms 1, 4 and 5, where are these carbon atoms found in the end products of alcohol fermentation by *Saccharomyces cerevisiae*? Give the chemical structures and names of the metabolic intermediates and products and mark with a star (*) the carbon atoms that will be radioactive. (14 points)

參考用