

1. 簡述桃莉羊是如何複製的 (8%)，在生醫方面最可能的運用為何？ (2%)
2. Polymerase chain reaction (PCR) is an important tool to produce DNA molecules of interest. However, the drawback of this technique is the high-risk of carry-over contamination of amplified products. Please describe how you would do to prevent such contamination during PCR procedure (10%).
3. 生物晶片是什麼？ (6%) 請舉兩個例子做說明 (4%)。
4. Sickle-cell anemia is caused by a single genetic mutation. How can you use microarray technology to detect patients with sickle-cell disease, please describe the principle of the detection. (10%)
5. 什麼是生技藥劑？請舉例說明之。(10%)
6. “Stem cell” research is a quickly expanding research field, indicating that it has a great potential for the biomedical uses. Please describe its application to the disease therapy. That is, please state the principle, the brief procedure, and the application of “stem cells”. (10%)
7. What is “anti-sense” drug? Please give the definition and state the mechanism of how it can be used as a therapeutic drug. (10%)
8. Large scale purification of proteins is an important step for preparing many different kinds of therapeutic and diagnostic reagents. Please describe the **cheapest** and **easiest** way to obtain a large amount of **eukaryotic** proteins, regardless of variations contributed by the different natures of proteins. That is, which organism should one choose to work on? And, what are the basic steps in the protocol? (10%)
9. In the current field of Molecular Diagnosis, what is the most common way to screen for the existence of any unknown mutation within a gene, except the direct DNA sequencing? Please describe the principle and the brief procedure for it. (10%)
10. What is “gene therapy”? Please describe the principle and a commonly used protocol for it. And, what are the problems that the gene therapy researchers are facing right now? (10%)