

1. (A) 有一醫檢研究人員想利用癌症病患血清尋找 novel tumor marker，請設計二種蛋白質體實驗方法來進行包括：(1) protein preparation、(2) separation、(3) profiling、(4) detection technology；並敘述其原理及優缺點。(15%)
(B) Why is 1 gene no longer equal to one protein? (5%)
2. 何謂生物晶片(biochip)?有那些可能用途? 請舉例說明。(10%)
3. 免疫分析法(immunoassay)和核酸擴增分析法(如 PCR)各有那些優缺點? 請加以說明。(10%)
4. (A) You have been given the task of developing a simple, sensitive and reproducible diagnostic procedure for a new double-stranded DNA virus that is devastating a local cattle population. Because effective treatment of this disease depends on early and correct diagnosis, you need to be able to detect the very low levels of this virus that are present in infected animals several weeks prior to the onset of disease symptoms. Briefly, explain how you would proceed and why you have chosen a particular course of action (14%)
(B) For diagnostic assays, what is meant by sensitivity, specificity, and simplicity? (6%)
5. You are working on design of an *in vitro* diagnostic kit. If the target exists in a tiny amount, please list four known methods for "amplification". (20%)
6. Describe five different methods to identify single nucleotide polymorphism (SNP) (14%). And list three diseases that are caused by SNP and the gene involved in each type of disease. (6%)