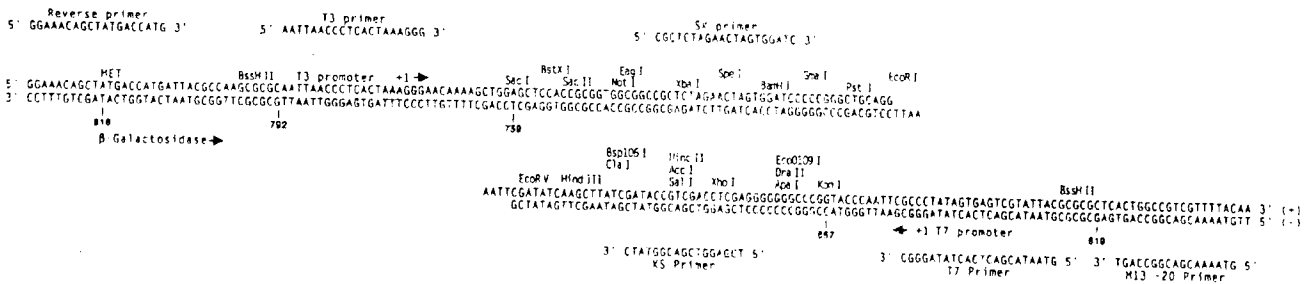
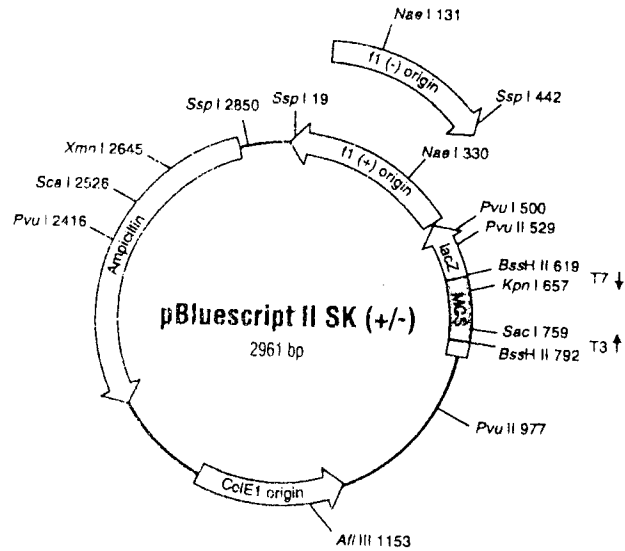


1. Please list and describe briefly three methods that can be applied to quantify message RNA amount, and how the approaches work? (10%)
2. 以目前生物技術若想分離大分子 DNA (如 > 100 Kb) 要何種方法來分離並簡述其基本原理。(10%)
3. Dr. Lin has recently identified a novel protein from a human brain library. In order to further delineate the biological role of this protein in brain development, she is now very interested in characterizing what other proteins would interact or associate with this novel protein. She is about to assign this project to one of her student. What technique(s) would you think she should propose to her student? Please propose a technique and briefly describe the theory of this technique (10%).
4. Automated sequencing, regardless the manufacturers of the machines, is now widely available to researchers who are in biotechnological fields. Please describe, in details, the principle of the technique with comments on its advantages and disadvantages. (10%)
5. 現階段如何利用生物技術的方法來證實病人的組織確實含有一種未知細菌之感染。(10%)
6. Please describe briefly three mutation screening methods that typically be used to identify sequence variants or polymorphism. (10%)
7. Please 1) describe "DNA chips" and how it works, and 2) give two examples of applying this technique in studies which would be beneficial to mankind (10%).
8. VIAGRA is a powerful and useful drug. Please describe what it does physiologically (10%).
9. What are the major steps in polymerase chain reaction (PCR) and their principle? (10%)

(背面仍有題目,請繼續作答)

10. The commercial available plasmid pBluescript II SK (+/-) vector, showing below, has been widely used in many biotechnological fields. Please explain the following terms and their functions (1% each):

- a. MCS
- b. ColE1 origin
- c. Ampicillin
- d. Sca I 2526
- e. T7 →



If a gene X is flanking with many sites at its 5'- and 3'-ends (shown below), how can you subclone this DNA fragment into pBluescript II SK (+/-) vector to produce the antisense strand of the gene for site-directed mutagenesis? (5%)

DNA fragment:

