

系所組別： 生物科技研究所甲、乙組

考試科目： 生物技術

考試日期： 0307 · 節次： 3

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Short Essay 簡答題: (100 分)

1. What is marine biotechnology? Please give an example for describe it. (6 points)
2. How do restriction enzymes make it possible to create recombinant DNA molecules. (6 points)
3. Why is polymerase chain reaction (PCR) an extremely valuable technique? List and describe the rationale behind the major steps involved in PCR (6 points)
4. How has biotechnology enhanced medical diagnosis and treatment? Provide some specific examples. (6 points)
5. Describe the two most significant problems with the more practical use of the magic bullet approach to chemotherapy using monoclonal antibodies. (6 points)
6. What is tissue engineering? Please give an example for describe it. (7 points)
7. If you want to select a GFP-producing stable cell line in mouse cell line, please explain why you need a drug selection marker? (7 points)
8. What is DNA vaccine? Please describe its principle and applications in vertebral system. (7 points)
9. Please describe what is gene transfection? And give three methods for transferring plasmid into eukaryotic cells. (7 points)
10. What is loss-of-function approach? Please describe the principle and give an example. (7 points)
11. What is DNA array method and how to apply this technology in lung cancer study? (7 points)
12. If you have a 1.2 Kb cDNA clone that contained a transcription factor YY1 from a zebrafish embryonic library (at 12 hpf), how do you analyze this gene function in model fish system-zebrafish? (7 points)

(背面仍有題目,請繼續作答)

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13. Please explain why *Agrobacterium tumefaciens* is used to deliver foreign DNA into plant chromosome now although it can cause crown gall disease in plants? (7 points)

14. What properties are required in an expression vector for overexpression of an inserted gene? (7 points)

15. What major reason is there for using an ELISA test on human blood samples to determine whether they contain HIV? (7 points)