國立中山大學八十九學年度碩博士班招生考試試題

科　目：生科所（生物科學）

試題共九題，請任選四題作答，每題 25 分(共計 100 分)；
<u>違規超選作答者</u>，以最低分之四題計

1. Describe **two** of the most important discoveries in biomedical research during the 20th century. What is the key impact of each discovery on the advancement of science?

2. The "Human Genome" project is to be completed within this year. What do you know about this project? What is its impact on biomedicine?

3. What is "homeostasis"? What are the roles of the nervous system **and** endocrine system in the maintenance of homeostasis?

4. Column chromatographic methods are commonly used in the purification of proteins. Please discuss in detail on the principle of the following three methods:
(1) Ion-exchange chromatography
(2) Gel-filtration chromatography
(3) Affinity chromatography

5. (1) Define "operon"
(2) What does the *lac* operon encode?
(3) Explain in detail on how does the expression of this *lac* operon is regulated?

6. (1) Distinguish between aerobic respiration and fermentation.
(2) There are some microorganisms that could perform "anaerobic respiration". What is "anaerobic respiration"?

7. 詳論生物多樣性及其對人類的貢獻。

8. 詳論近百年來植物生態學發展的哲學基礎。

9. 詳論 r 及 K 選擇在族群形成的角色及機制。