

國立中山大學九十一學年度博士班招生考試試題

科目：生物科學【生科系】

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問答題：請任選四題作答，每題 25 分，答題若超過四題者以得分最低的四題計算分數。

1. Productivity differs from one ecosystem to another. What factors influence the productivity of ecosystems? How does productivity change with time?
2. What are some of the mechanisms of competition in plants and in animals? What are the roles of competition in shaping a community structure?
3. What are the factors that may cause extinction? How do invading species increase the risk of extinction in island systems?
4. Describe the molecular mechanism of plant hormones (IAA or GA or ABA) in detail.
5. Describe a methodology to separate a mixture containing glucose, aspartic acid, protein A (pI 3.5, MW 124 kDa), and protein B (pI 9.0, MW 125 kDa).
6. Describe the lac operon or trp operon in detail.
7. Describe the types of immune response mediated by T_H1 and T_H2 subsets, respectively. Show the regulation of T_H subsets by cytokines with a drawing. What type of antigen challenge is likely to induce a T_H1 -mediated response?
8. What are the potential uses and hazards of cloned animals produced by nuclear transfer from adult somatic cells?
9. Describe the advantages and disadvantages of using attenuated organisms, purified macromolecules, and synthetic peptides as vaccines, respectively.