

系所組別： 生命科學系丙組

考試科目： 生態學

考試日期：0224，節次：2

※ 考生請注意：本試題不可使用計算機
請詳讀題意，注意每題中可能有多重子題，並請依序作答。

1. 以世代重疊族群之非連續增長 (discrete population growth) 及世代重疊族群之連續增 (continuous population growth)，分別寫出臺南七股地區黑面琵鷺 (*Platalea minor*) 的越冬族群增長模式，並討論如何取得族群增長率 (population growth rate) 與各參數 (parameters) (10%)
2. 以南仁山陸域生態系為例，並從生態系功能 (ecosystem function) 的觀點，探討如何量化各群聚作用的大小及如何探討營養結構動態 (10%)
3. **Coral reefs and deep sea** are discussed as the two most diverse marine communities on earth. **Discuss** which of these communities has the most total diversity, and justify your choice with a discussion of why and how diversity is greater in one of the communities. Of the communities mentioned above, **discuss** at least one ecological (biological/physical/geographical) or evolutionary hypothesis which has been proposed to explain the high diversity for each community. (10%)
4. Suppose you are assigned to study the eco-physiology of a sea snake. Based on air, water/salt, and food supply, **discuss** your approaches including: What types of data will you be collecting, how may you acquire them and why these data are important for your research? (10%)
5. Plants are often more physiologically challenging foods for animals than are other animals. **Describe** some of the challenges of eating plants. (10%)
6. **Explain** what is meant by "life history characteristics" of seed plants, including a summary of the most important ones. **Discuss** how ecological, genetic and evolutionary properties and processes interact and contribute to variation in life history characteristics. (10%)
7. Please **illustrate** the carbon cycle in terrestrial ecosystem; and following the journey of carbon, please **explain** how human activities have caused global warming and how climate change may alter terrestrial net primary production. (10%)
8. Spatial configuration of biodiversity is a fundamental issue in ecology. A notable geographic pattern is a general decline of species richness along the latitude as one moves pole-ward. Please **explain** possible mechanisms underlying this phenomenon. (10%)
9. In planning to study foraging behaviors and species interactions in a mountain area, what similar and different approaches you may take for (a) dragonflies and birds; and for (b) fishes living in a lake and in a stream, respectively (10%)
10. Distinguish (a) scramble vs. contest competition; and (b) numerical vs. functional response of predators, respectively (10%)