國立中山大學114學年度
碩士班考試入學招生考試試題

科目名稱：普通生物學【海科系碩士班甲組】

—作答注意事項—

考試時間：100分鐘

- **考試開始鈴響前不得翻閱試題，並不得書寫、劃記、作答。**請先檢查答案卷（卡）之應考證號碼、桌角號碼、應試科目是否正確，如有不同立即請監試人員處理。
- **答案卷限用藍、黑色筆(含鉛筆)書寫、繪圖或標示**，可攜帶橡皮擦、無色透明無文字墊板、尺規、修正液（帶）、手錶(未附計算器者)。每人每節限使用一份答案卷，請衡酌作答。
- 答案卡請以2B鉛筆劃記，不可使用修正液（帶）塗改，未使用2B鉛筆、劃記太輕或污損致光學閱讀機無法辨識答案者，後果由考生自負。
- 答案卷（卡）應保持清潔完整，不得折疊、破壞或塗改應考證號碼及條碼，亦不得書寫考生姓名、應考證號碼或與答案無關之任何文字或符號。
- 可否使用計算機請依試題資訊內標註為準，如「可以」使用，廠牌、功能不拘，唯不得攜帶書籍、紙張（應考證不得做計算紙書寫）、具有通訊、記憶、傳輸或收發等功能之相關電子產品或其他有礙試場安寧、考試公平之各類器材入場。
- **試題及答案卷（卡）請務必繳回，未繳回者該科成績以零分計算。**
- **試題採雙面列印，考生應注意試題頁數確實作答。**
- **違規者依本校招生考試試場規則及違規處理辦法處理。**

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※本科目依簡章規定「不可以」使用計算機(問答申論題)　　

以下題目共五題，每題二十分，請詳盡作答。

1. Marine organisms have evolved various reproductive strategies. Compare the advantages and disadvantages of broadcast spawning versus brooding in marine invertebrates. Use specific examples to discuss how environmental factors influence these reproductive strategies.
2. Discuss how symbiotic relationships shape marine ecosystems. Include examples of mutualism, commensalism, and parasitism, and explain how these relationships might be affected by environmental changes.
3. Explain the principles of population genetics and how they apply to marine populations. Include discussions of:
    a. Hardy-Weinberg equilibrium
    b. Genetic drift
    c. Gene flow
    d. Natural selection

    Use specific marine examples to illustrate these concepts.
4. Explain the process of DNA replication and repair. How might environmental stressors (such as UV radiation or chemical pollutants) affect these processes in marine organisms?
5. Analyze the concept of ecological succession in marine ecosystems, using coral reefs and hydrothermal vents as contrasting examples. In your answer:
    a. Compare and contrast primary and secondary succession processes in these two ecosystems
    b. Explain the roles of pioneer species and their importance in community development
    c. Discuss how biological interactions (competition, predation, and facilitation) shape the succession process
    d. Analyze how disturbances (both natural and anthropogenic) affect succession patterns
    e. Evaluate how climate change might influence successional trajectories in these ecosystems

    Support your answer with specific examples of key species and their ecological roles at different successional stages.