

I. Short essays (35%)

1. Give a short definition, description, or example for each of the following (15%):

- 1). Pollination
- 2). Sex allocation
- 3). Dendrochronology
- 4). Ramet
- 5). Ordination

2. There are numerous strategies of reproduction in plants. Describe two unique situations (e.g. types of communities, or certain events are happening) where a plant would be at an advantage if it reproduced sexually, and another two situations where a plant would be at an advantage if it reproduced asexually. Explicitly state how the reproductive strategy of the plant results in benefits in each example. (8%)

3. Why is it that scientists have had a difficult time predicting species invasions (both who invades and what communities are invaded)? If you are given the job of instituting a biological control program for an invasive species, what specific information would you want to know before you introduced any natural plant enemies? (7%)

4. What is a Community in Modern Synthesis points of view? (5%)

(背面仍有題目,請繼續作答)

II. Short essays (40%)

1. What is a niche? (5%)
2. Why do most insect herbivores eat only one or two species of plant? (5%)
3. Why don't predators over eat their prey? (5%)
4. What is meant by the structure and function of an ecosystem? (5%)
5. How have human activities interfered with nitrogen cycle? (10%)
6. What is a biocide, and how does it damage the environment? (10%)

III. Short essays (25%)

1. Laboratory experiment showed that Taiwan shovel jaw carp, *Varicorhinus barbatulus*, could tolerate water temperature range of 3-32 °C. However, field investigation found that *Varicorhinus barbatulus* was absent from areas with water temperature higher than 26 °C. Give the possible explanations for the differences between the laboratory and the field studies. (6%)
2. What are life history characteristics of a species? Why are they important to population ecologists of the species? (6%)
3. What is a keystone species? How can a keystone predator affect the structure of a community? (6%)
4. The dams that have been built on many rivers often stabilize river flow by increasing flow below the dam during droughts and decreasing the amount of flooding during periods of high rainfall. Explain how these stabilized flows can be considered as a "disturbance". Using the intermediate disturbance hypothesis, predict how stabilized flows would affect the diversity of river organisms below reservoirs. (7%)