

1. Field investigation found that the distribution of *Bufo melnostictus* is restricted to altitude lower than 500 m in Taiwan. What are the possible explanations for its limited altitudinal distribution? (8%)
2. In order to understand the population dynamic of the endangered Black-faced Spoonbill, what parameters or variables will you study? (8%)
3. The American bullfrog, *Rana catesbeiana*, is listed on the top 100 invasive species in the world and has also established in Taiwan. What experiments will you design to evaluate its impact on local community? And why? (10%)
4. What is biodiversity? How are functions of an ecosystem affected by a loss of biodiversity? (8%)
5. Amphibian deformity has been reported in 43 states of United States and 5 provinces of Canada as well as in other countries of the world. Laboratory experiments showed that the tadpoles infected by the parasitic trematodes will develop limb deformity in the adults. However, high incidence of amphibian deformity was also found in areas where atrazine (a herbicide) was widely used. Please design an experiment to demonstrate the effect of atrazine on amphibian deformity. (10%)
6. Write down the names of a few periodicals of ecology other than "Ecology". (6%)
7. What are generalist and specialist species? (10%)
8. How do species interact in a community? (10%)
9. Who help keep ecosystems running smoothly? (5%)
10. Describe the nitrogen cycle in an ecosystem. (10%)
11. How does a habitat differ from a niche? (5%)
12. What is a microbial community? Please design and experiment to analyze the structure of microbial community. (10%)