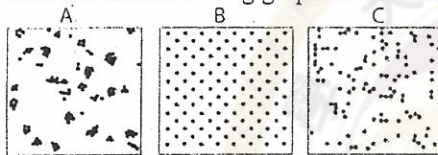


一、選擇題(每題3分，共30分) ※本大題請於試卷內之「選擇題作答區」依序作答。

- Which term describes the presence of unique species found nowhere else?
A) Extinction B) Biodiversity C) Polyploidy D) Endemism
- What do you call the interactions of all living organisms with the non-living factors in a given area?
A) Photosynthesis B) An environment C) Abiotic factors D) An ecosystem
- Which of the following is true regarding r-selected species?
A) Tend to be larger organisms B) Tend to mature late
C) Tend to be strong competitors D) Tend to display a high per capita rate of increase.
- Species whose population numbers are resilient to disturbance would normally have all the listed characteristics, except
A) Long life span B) Small body size C) High reproductive rate D) All the above would be characteristics of a resilient species.
- What factors increase a species' vulnerability to extinction?
A) Small local population B) Narrow habitat range (habitat specialist)
C) Small geographic range D) All of the above
- Density-dependent regulatory factors stabilize a population near its
A) Carrying capacity B) Niche C) Climax D) Habitat
- Which of the following graphs shows individuals distributed according to a random distribution?



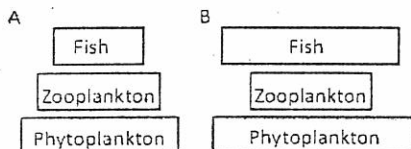
- Based on Island Biogeography, smaller islands have fewer species because
A) Lower rate of colonization B) Higher rate of extinction
C) A smaller species pool to draw from D) lower carrying capacity
- When competing individuals do not directly interact with one another, but rather respond to the level of resource availability that is depressed by the consumption by other individuals in the population, this form of competition is called
A) Scramble competition B) Contest competition
C) Exploitation competition D) Interference competition.
- A bird that eats plant-eating insects occupies what trophic level?
A) 1st B) 2nd C) 3rd D) 4th

二、名詞解釋(每題4分，共20分)

- Allee effect
- Phenotypic plasticity
- Commensalism
- Eutrophication
- Community

三、簡答題(每題10分，共50分)

- What is niche? What is the difference between "Fundamental niche" and "realized niche"?
- List three levels of biodiversity. Draw a graph to show the relationship between ecosystem function and biodiversity. Explain why you see the relationship.
- What is Hardy-Weinberg equilibrium? What are the five assumptions for maintaining the Hardy-Weinberg equilibrium?
- In two lakes (A and B below), you observed biomass of fish, zooplankton and phytoplankton. Explain the different mechanism that determines the biomass pattern in lake A and B. (hint: trophic level).



- Write down equations to describe Lotka-Volterra predator-prey interaction model (without self-density dependence) and clearly identify all model components (symbols). Draw a graph to sketch how the biomass of predator and prey changes through time in this predator-prey model.