

Please answer **ALL** questions.

Each question carries different marks.

Write all your answers in Black or Blue pen. Do **NOT** use pencil.

You can use either **ENGLISH** or **CHINESE** to answer the questions.

1. 空氣中的二氧化碳濃度增加，會影響氣候變遷，說明其機制。(15%)
2. 當大量有機污水排入河川中游，繪圖河川水中溶氧在中、下游的變化，並說明理由。(15%)
3. State the **ecological definition** and the **conservation importance** of each of the following terms. (15%)
  - (A) Umbrella species.
  - (B) Keystone species.
  - (C) Endangered species.
4. Answer the following question concerning population
  - (A) What are the **four** basic parameters for estimating population size? (4%)
  - (B) Give the **definition** for each of these four parameters. (12%)
  - (C) Briefly state **how** each of these parameters affects the population size. (4%)
  - (D) In a population study of the Taiwan salmon *Oncorhynchus masou formosanus* 台灣櫻花鉤吻鮭 in an upstream tributary of Chijiawan Stream 七家灣溪, capture-recapture method was used to estimate the population size. In the first day, the researcher marked and released 96 fish. Two days later, he caught 208 trout, of which 28 were marked. What is the **total population size** of *O. masou formosanus* at this tributary (**Show your calculation steps**). (5%)
5. Invasion of exotic species is one of the key human-caused impacts threatening the ecosystem health.
  - (A) What is the **difference(s)** between 'exotic species' and 'invasive species' (4%)?
  - (B) **Explain why** the rate of spread of exotic species increases with human population growth (6%).
  - (C) Figures below shows the results from a study of the invasion effect of pathogens (virus and parasites) on the native birds on the Hawaiian Islands. **Answer the following three questions with respect to the Figure 5a and 5b.**

Figure 5a

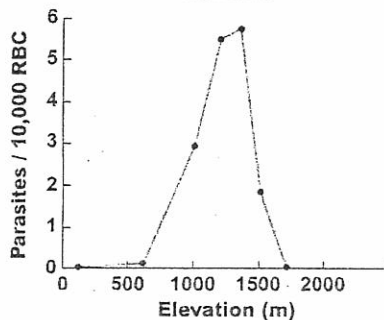
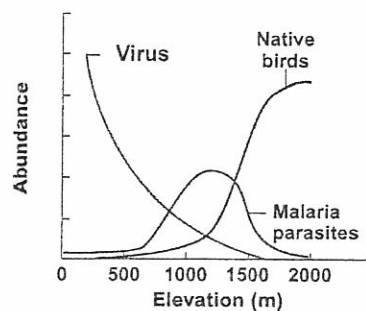


Figure 5b



- i. What is/are the limiting factor(s) of geographic distribution of the **native birds**? State your reason(s). (8%)
- ii. What is/are the limiting factor(s) of geographic distribution of the **pathogens**(virus and parasites)? State your reason(s). (8%)
- iii. Determine the **key reason** causing the spread of pathogens and migration of native birds. (4%)

\*\*\* End of paper \*\*\*

試題隨卷繳回