

題號： 183

國立臺灣大學 114 學年度碩士班招生考試試題

科目：環境科學概論(B)

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※ 注意：請於試卷內之「非選擇題作答區」標明題號依序作答。

Please refer to the following description for question 1-4

In 2024, *Nature* published several significant studies addressing pressing environmental issues. Some of the key topics covered including:

A. Plastic Pollution

The widespread problem of plastic pollution, especially in marine ecosystems, was explored. Research concentrated on the long-lasting nature of plastics in the environment and their harmful impacts on wildlife and ecosystems.

B. Biodiversity Loss

Articles highlighted the concerning pace of biodiversity loss, emphasizing the link between climate change and the decline of nature.

C. Climate Change and Global Warming

Research emphasized the rapid pace of global warming, with 2023 being recorded as the hottest year on record. Studies underscored the critical need to reduce greenhouse gas emissions to lessen the severe environmental and socio-economic consequences.

D. Deforestation and Land Use

Research examined the effects of deforestation and land degradation on climate stability and biodiversity. It stressed the importance of integrated land-use strategies to harmonize climate, nature, and human needs.

E. Pollution and Health Risks

Studies highlighted the health risks linked to environmental pollution, including chemical contaminants such as per- and polyfluoroalkyl substances (PFAS). PFAS are a group of synthetic chemicals that are persistent in the environment.

1. (6%) Which of the following is incorrect for biodiversity

- a) Three kinds of biodiversity are essential to preserve the ecological system: genetic, species and ecological diversity.
- b) Habitat destruction is the major threat to biodiversity.
- c) Pollution contaminants ecosystems, harming species and increase the loss of biodiversity
- d) Island ecosystems are more resilient and not susceptible to invasive species.
- e) Biodiversity plays a critical role in ecosystem resilience and can help ecosystems adapt to changing climate conditions.

2. (6%) What is the primary environmental concern associated with single-use plastics.

- a) They persist in the environment and can be the source of microplastics in the aquatic systems
- b) They degrade quickly and release harmful chemicals.
- c) They release volatile organic compounds to the environment.
- d) They are expensive to produce and cause overuse of resources.
- e) All of the above

3. (6%) Per-and polyfluoroalkyl substances (PFAS) are example of:

- a) Organic compounds
- b) Inorganic compounds
- c) Heavy metals
- d) Pathogens
- e) Radiative substances

4. (15%, short answer) There is a strong link between climate change and the biodiversity loss. Please explain the potential relationship between the biodiversity loss with water pollution. Specifically, **how can biodiversity loss exacerbate the water pollution?** Provide 3 examples and explain.

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5. (17%, short answer) Discuss how the **polarity** of pollutants influences their persistence and movement/transport/fate in the environment. Provide one example of polar pollutant and one example of non-polar pollutant and their ecological/or human health impact.
6. Please draw a figure to explain the treatment procedures of a typical secondary wastewater treatment plant with water reclamation to produce high-quality water for high-tech industry use. (10%)
7. Please list 5 indoor air pollutants and their emission sources, which may be found in most modern homes. (10%)
8. Please explain the following types of capital and resources used to produce goods and services? (15%) (a) Natural capital; (b) Human capital; (c) Manufactured capital.
9. Please explain the international "4 per 1000" Initiative, which was introduced, in 2015, at the UNFCCC CoP 21, as part of the Lima-Paris Plan of Action. (15%)

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