

國立臺北科技大學 112 學年度碩士班招生考試

系所組別：3220 環境工程與管理研究所乙組

第一節 環境科學 試題

第 1 頁 共 3 頁

注意事項：

1. 本試題共 17 題，第 1-16 題 每題 5 分，第 17 題 20 分，共 100 分。
2. 不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

Question 1 (5%)

The burning of coal in the boiler is an example of

- A. a renewable reaction.
- B. an exothermic reaction.
- C. an endothermic reaction.
- D. conversion of mechanical to potential energy.

Question 2 (5%)

At present coal is the main fuel used in the boilers. Environmentalists suggest that natural gas should replace coal. This is most likely because

- A. natural gas is renewable but coal is not.
- B. natural gas is more easily stored than coal.
- C. the cost of transporting the coal will be saved.
- D. natural gas produces less carbon dioxide per unit of energy released compared with coal.

Question 3 (5%)

Environmental Risk Assessments are designed to

- A. determine the least expensive way to protect the environment.
- B. eliminate the risk of pollution affecting people and the environment.
- C. minimize the number of people who are concerned about an issue.
- D. provide decision-makers with information about the impacts of their decisions.

Question 4 (5%)

The dosage of a pollutant that a person receives is the amount of pollutant

- A. absorbed per unit of body weight.
- B. taken in through the mouth.
- C. present in the environment.
- D. that will cause harm.

Question 5 (5%)

The amount of dioxin required to kill an animal depends on its body weight.

If 50% of dogs die when they consume a dose of 1.5 mg/kg, what dose would be expected to kill 50% of dogs that weigh 15 kg?

- A. 0.1 mg
- B. 1.5 mg
- C. 7.5 mg
- D. 22.5 mg

Question 6 (5%)

A factory uses recycled paper to produce pulp that is then used to make paper.

If 75% of the recycled paper is converted into pulp, how much recycled paper is required to produce 1 tonne of pulp?

- A. 0.25 tonnes
- B. 0.75 tonnes
- C. 0.95 tonnes
- D. 1.33 tonnes

Question 7 (5%)

PCBs (polychlorinated biphenyls) are a health risk to humans due to bioaccumulation.

Which one of the following properties contributes most to bioaccumulation?

- A. high volatility
- B. solubility in water
- C. solubility in fatty tissues
- D. artificial manufacture by industry

注意：背面尚有試題

Question 8 (5%)

An integrated waste management approach for industrial enterprises

- A. eliminates unnecessary packaging
- B. makes a product require frequent replacement
- C. uses more material
- D. encourages built-in obsolescence

Question 9 (5%)

Which of the following statements most accurately describes the South Asian brown cloud?

- A. Although very serious, the Asian brown cloud problem has not affected countries outside of China, India, or Bangladesh.
- B. Pollution from the Asian brown cloud is thought to have contributed to premature deaths from air pollution, but to date there is no accurate count or estimate of the numbers.
- C. The Asian brown cloud has never affected the United States, although it has moved somewhat over Asia and the western Pacific.
- D. The Asian brown cloud results from drought, burning of forests, burning of biomass, burning of coal, and the consequent release of fly ash and toxic metals

Question 10 (5%)

Which of the following is categorized as a secondary pollutant?

- A. carbon monoxide
- B. ozone
- C. carbon dioxide
- D. sulfur dioxide

Question 11 (5%)

Photochemical smog is characteristic of urban areas with many vehicles and a climate that is

- A. cool, wet, and cloudy
- B. cool, dry, and sunny
- C. warm, dry, and sunny
- D. warm, wet, and cloudy

Question 12 (5%)

According to WHO (World Health Organization) and World Bank experts, indoor air pollution is

- A. the world's most serious air pollution problem
- B. the world's least serious air pollution problem
- C. a serious problem in poor countries, but no problem in affluent countries
- D. none of these answers

Question 13 (5%)

Increased levels of carbon dioxide in the atmosphere have been implicated in which of the following?

- A. increased global warming
- B. decreased seawater temperatures
- C. both increased global warming *and* increased seawater acidity
- D. both increased global warming *and* decreased seawater temperatures

Question 14 (5%)

The use of hydrogen gas would eliminate most of the air pollution problems we have today because:

- A. When it burns it combines with carbon dioxide and removes it from the air.
- B. When it burns it combines with water to produce heavy rainwater.
- C. When it burns it combines with oxygen gas in the air to produce water vapor.
- D. When it burns it combines with carbon to produce methane gas.

Question 15 (5%)

A soft energy path is one that

- A. relies on improving energy efficiency and increasing the use of a variety of renewable energy resources
- B. relies completely on the use of biofuels
- C. relies on the use of liquid fossil fuels
- D. relies on the use of soft money for research and development

Question 16 (5%)

Which of the following would be part of an ecosystem approach to preventing premature extinction of wild species?

- A. Protect threatened habitats and ecosystem services.
- B. Locate and protect the most endangered ecosystems.
- C. Restore as many degraded ecosystems as possible.
- D. All of these answers

Question 17 (20%)

Please derive the equation of terminal settling velocity of a spherical particle. Make your assumption if necessary.

$$V_{TS} = \frac{\rho_p d_p^2 g}{18 \eta}$$

V_{TS} : terminal settling velocity

ρ_p : particle density

d_p : particle diameter

g : gravitational acceleration

η : gas viscosity