

國立臺北科技大學 114 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

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注意事項：

1. 本試題共 20 題，每題 5 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。

1. Which one is NOT commonly employed as a physical treatment method in wastewater engineering? (5%)
 - A. Sedimentation
 - B. Filtration
 - C. Aeration
 - D. Screening
2. Which one is the main gas produced by anaerobic digestion of sludge? (5%)
 - A. Carbon monoxide and helium
 - B. Methane and carbon dioxide
 - C. Carbon dioxide and water
 - D. Oxygen and hydrogen sulfide
3. What is the primary distinction between a circular economy and a linear economy? (5%)
 - A. Reduced product lifespans to foster consumption.
 - B. Diminished resource utilization efficiency, leading to decreased waste.
 - C. Sustained resource utilization and reduced waste generation.
 - D. Uniform product design to minimize production expenses.
 - E. Accelerated economic growth and expanded employment prospects.

4. What is the primary objective of allocation within the framework of life cycle assessment? (5%)
 - A. To apportion the inputs and outputs of a process among various products.
 - B. To equitably distribute a product's environmental burdens across all implicated stakeholders.
 - C. To segment a product's life cycle into distinct phases.
 - D. To shift a product's environmental impacts onto other products.
5. SDG 11 calls for making cities and human settlements inclusive, safe, resilient and sustainable. Which of the following initiatives best contributes to this goal? (5%)
 - A. Fostering the use of private automobiles.
 - B. Advancing green building practices.
 - C. Expanding development at the urban periphery.
 - D. Increasing the density of high-rise structures in urban areas.
6. What was the primary focus of COP29? (5%)
 - A. Expediting the transition away from fossil fuels.
 - B. Bolstering global adaptive capacity to climate change.
 - C. Fortifying climate finance mechanisms.
 - D. Facilitating the growth of carbon markets.
7. What's the potential health consequence of chronic exposure to high-intensity noise? (5%)
 - A. Auditory impairment
 - B. Cardiovascular conditions
 - C. Sleep disturbances
 - D. All of the aforementioned
8. What are the potential health impacts of exposure to fine particulate matter (PM2.5)? (5%)
 - (a) Prone to inducing allergic rhinitis.
 - (b) May result in cardiovascular diseases.
 - (c) May cause pulmonary burns.
 - (d) May elevate the risk of lung cancer.
 - A. (a), (c), (d);
 - B. (a), (b), (c);
 - C. (a), (b), (c), (d);
 - D. (a), (b), (d).

注意：背面尚有試題

9. Which of the following is excluded from the category of common flue gas denitrification technologies? (5%)
- A. Selective Catalytic Reduction (SCR)
 - B. Selective Non-Catalytic Reduction (SNCR)
 - C. Wet scrubbing
 - D. Electron beam method
10. Which of the following does NOT influence the performance of a flue gas denitrification system? (5%)
- A. Flue gas temperature
 - B. Ammonia to nitrogen oxides ratio
 - C. Flue gas velocity
 - D. Fuel type
11. The distinguishing feature between the Lowest Achievable Emission Rate (LAER) and the Best Available Control Technology (BACT) as defined in air pollution control regulations is: (5%)
- A. LAER imposes a more stringent emission standard compared to BACT.
 - B. BACT is solely defined by the most efficient technology available based on current scientific understanding.
 - C. LAER places greater emphasis on economic considerations.
 - D. BACT considers a more comprehensive array of factors.
12. Which of the following frequency weightings is specifically used for measuring aircraft noise? (5%)
- A. A-weighting
 - B. C-weighting
 - C. D-weighting
 - D. G-weighting
13. Which of the following statements about the impact of atmospheric stability on the dispersion of air pollutants is INCORRECT? (5%)
- A. The higher the atmospheric stability, the easier it is for pollutants to disperse.
 - B. Temperature inversion inhibits vertical mixing in the atmosphere, aggravating pollution.
 - C. Atmospheric stability is related to convective activity.
 - D. The higher the stability, the more likely it is for the concentration of suspended particulate matter in the air to increase.
14. The principal objective of introducing coagulants in the coagulation process of water treatment is to: (5%)
- A. Augment the surface area of colloidal particles.
 - B. Compress the electrical double layer, thereby diminishing the inter-particle repulsive forces.
 - C. Elevate the pH of the solution.
 - D. Facilitate the dissolution of colloidal particles.
15. Which of the following best describes the primary difference between Dense Non-Aqueous Phase Liquid (DNAPL) and Less Dense Non-Aqueous Phase Liquid (LNAPL) in groundwater contamination? (5%)
- A. The density of DNAPL is larger than water, while LNAPL is smaller than water.
 - B. DNAPL is more soluble in water, while LNAPL is insoluble in water.
 - C. DNAPL is primarily composed of organic compounds, while LNAPL is primarily composed of inorganic compounds.
 - D. DNAPL is more toxic than LNAPL.
16. Among the following water treatment processes, which is the advanced water treatment processes and most effective for eliminating trace organic contaminants from water? (5%)
- A. Coagulation-sedimentation
 - B. Biofilm process
 - C. Activated carbon adsorption
 - D. Ion exchange

17. Which of the following statements about electrostatic precipitators is correct? (5%)

- A. It primarily relies on gravity to capture particulate pollutants.
- B. It is suitable for capturing high-resistivity particulate pollutants.
- C. It offers low pressure drop for high-volume polluted gas streams.
- D. It does not produce secondary pollution.

18. Which of the following statements most accurately describes the South Asian brown cloud? (5%)

- 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.

19. Which of the following would function as a pollution cleanup method for motor vehicles? (5%)

- A. Improve motor efficiency.
- B. Rely on mass transit and bicycles.
- C. Use emission-control devices.
- D. Add a charge to new cars based on the amount of pollution they produce.

20. What is the most abundant gas in the atmosphere? (5%)

- A. oxygen
- B. nitrogen
- C. methane
- D. water vapor