

# 國立中央大學 114 學年度碩士班考試入學試題

系所：環境工程研究所 碩士班 乙組(一般生)

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科目：環境工程概論

\* 本科考試可使用計算器，廠牌、功能不拘

申論、計算題(應詳列計算過程，無計算過程者不予計分)

1. Term explanation. Please write as much as you can to get the entire score (30%)  
(A) Total Kjeldahl nitrogen (TKN)  
(B) Primary air pollutants  
(C) Carbon sink  
(D) Coliform  
(E) Selective catalytic reduction (SCR)
2. Water is essential for the human body, and wastewater, after being used, also holds value for reuse. In recent years, the government has been actively promoting the reuse of urban wastewater by delivering treated recycled water to industrial zones for use in manufacturing processes. Please answer the following questions: (total 25%)  
(A) Please draw a schematic diagram of a typical treatment process for drinking water and explain the functions of each unit. (10%)  
(B) Please draw a schematic diagram of a typical treatment process for domestic wastewater and explain the functions of each unit. (10%)  
(C) If recycled water (pure water) is required to be produced for industrial usage, what is the treatment process? Please describe the functions of each unit. (5%)
3. Suppose the sewers shown in Figure 1 have  $Q_B$  and  $Q_A$  and  $Q_C$  are unknowns. By sampling the flow at the first manhole, it is found that the concentration of dissolved solids in the flow coming into Manhole 1 is 50 mg/L. An additional flow,  $Q_B = 100$  L/min, is added to Manhole 1, and this flow contains 20% dissolved solids. The flow through Manhole 2 is sampled and found to contain 1000 mg/L dissolved solids. What is the flow rate of wastewater in the sewer ( $Q_A$ )? (10%)

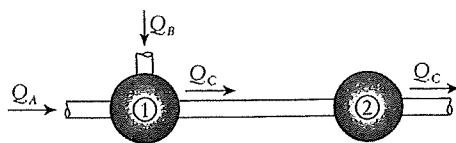


Figure 1. Schematic diagram of sewer manholes

4. Describe the sources and characteristics of air pollutants  $\text{SO}_2$ , suspended particulates,  $\text{CO}$ , and  $\text{NO}_2$ . (20%)
5. Please answer the following questions: (total 15%)
  - (1) According to the Taiwan Waste Disposal Act (廢棄物清理法), please write the classifications of waste (provide details as much as you can). (7%)
  - (2) Incineration, pyrolysis, and gasification are common thermal methods used to treat solid waste. Please describe the three methods and their applications. (8%)