國立成功大學

111學年度碩士班招生考試試題

編　號：142

系　所：環境工程學系

科　目：環境工程概論

日　期：0219

節　次：第 1 節

備　註：可使用計算機

※ 考生請注意：本試題可使用計算機。　請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

Air Pollution

1. Define and explain the following things (20%)

(1) Aerosol (5%)

(2) Dust (5%)

(3) Fly ash (5%)

(4) PM2.5 (5%)

Water and Soil Treatment

2. What is the oxygen sag curve? Draw a figure the explain the concept (5%). List three factors which would affect the dissolved oxygen in a river and explain their impacts (5%).

3. Explain the difference between lime softening, excess lime softening, and lime-soda ash softening and write down their chemical reactions. (10%)

4. Define soil vapor extraction and explain its process, treating materials, efficiency determining parameters, and advantages (10%).

Waste Treatment

5. Based on the characteristics of wastes. Please describe the classification criteria of hazardous waste (5%) and the general techniques used to detoxify the hazardous waste (5%).

6. A waste gas contains 1000 ppm of toluene. Estimate the temperature requires in an isothermal plug flow incinerator with a residence of 0.5 sec to give 99.9% destruction of toluene (MW = 92). Assume an oxygen mole fraction of 0.074 and a pressure of 101.3 kPa. $A = 4.47 \times 10^{10}$ s^{-1}, $E = 189300$ J/mole. (10%)

Environmental Management

7. What are the sustainable development goals? Explain and list at least three goals. (10%)

8. What are the four main groups of greenhouse gases except from CO_2 and CH_4? (5%) Where are these greenhouses gases emissions coming from? (5%)

9. What is carbon neutrality? How can society achieve carbon neutrality? Give at least three examples. (10%)