國立中央大學102學年度碩士班考試入學試題卷

所別：環境工程研究所碩士班 乙組(一般生)　科目：環境工程概論　共 1 頁　第 1 頁

本科考試禁用計算器

＊請在試卷答案卷（卡）內作答

參考用

1. (25%) Give a brief description or a definition of the following terminologies:
   (a) Greenhouse effect
   (b) Orthokinetic Flocculation
   (c) Bioconcentration
   (d) Adsorption
   (e) Absorption

2. (20%) In wastewater treatment, microorganisms are often used to convert dissolved organic compound to more microorganisms, which are then removed from the flow stream by such processes as thickening. One such operation is known as the activated sludge system. Suppose an activated sludge system has an influent of 500 l/sec at a suspended solid concentration of 50 mg/l. The wasted activated sludge flow rate is 10 l/s at a solids concentration of 1.2%. The effluent has a solid concentration of 20 mg/l. What is the yield of waste activated sludge in Kg per day?

3. (25%) A large stream has a reoxygenation constant of 0.4/day and a velocity of 1.0 m/s. At the point at which an organic pollutant is discharged, it is saturated with oxygen at 10 mg/l. Below the outfall the ultimate demand for oxygen is found to be 20 mg/l, and the deoxygenation constant is 0.2/day. Please derive the expression for the dissolved oxygen at the site *x* km downstream.

4. (15%) What are typical water treatment coagulants and what concern determines how coagulants are introduced to water?

5. (15%) Since the mid-1980's, the particulate matter standards have been based on PM_{10}. According to the current PM_{10} standards, the annual mean PM_{10} concentration must be kept below $65\mu g/m^3$, and the 24-hr average PM_{10} concentration must not exceed $125\mu g/m^3$. Recently, TW EPA announced the new air quality standards for particulate matter focus on $PM_{2.5}$. The new standard levels are $15\mu g/m^3$ for an annual average, and $35\mu g/m^3$ for a 24-hr average. Will the new standards for $PM_{2.5}$ be more difficult to meet than the standards for PM10? Why or why not?