



## Puu-127.4020 Process Water Treatment (3cr / Prof. O. Dahl)

**Exam 15.12.2008**

### **Compulsory questions (1-3)**

1. How is chemically treated water processed from raw water? (unit processes and their essential operating principles and order). 5p.

2. Briefly explain the following words, abbreviations or principles. 5p (0,5p each).

- a. Electrolytic flocculation
- b. Anaerobic treatment
- c. AOX
- d. Toxicity
- e. TOC
- f. BOD<sub>5</sub>
- g. LC<sub>50</sub>
- h. Tertiary treatment
- i. Nano filtration
- j. Adsorption

3. Briefly explain the main principles of the following determinations (what is measured, how and WHAT IT MEANS). Answer only **two (2)** questions. 5p (2,5 p each)

- a. Determination of suspended solids (SFS-EN 872, SFS 3008)
- b. Determination of hardness of water (SFS 3003)
- c. Determination of chemical oxygen demand (COD) (SFS 5504, SFS 3020)

### **Choose any two from the following questions (4 to 6). Answer only two (2) questions:**

4. Influent contains 50t COD/d. Floc load (max) is 0,25 kg COD/kg return sludge. Calculate return sludge amount (min) t/d. Include a figure and briefly describe the stages of a typical activated sludge process. 5p.

5. Most commonly used chemicals in effluent oxidation. Discuss the major advantages and future applications. 5p.

6. Principles of membrane filtration in wastewater treatment, grades and their suitability in removing various impurities. 5p.