

Please answer to 6 questions from 7. The answers to the five first ones should be short (max. half page). 6 and 7 are essays. You are allowed to use Finnish or English.

- 1a) Liter of water contains 0,4 g of NaOH. What is the pH? (m_{wNa} is 22, 989)

- 1b) How do you make 500 ml 6 M nitric acid from 15 M solution?

2. The solubility of gas to liquid can be calculated by Henrys Law?
 - a) What does it mean ? 3 p

 - b) You want improve the oxygen transfer efficiency of your aerator. What are the alternatives?

3. How do you analyze: (á 1/2 p)
 - a) taste and odor problems?

 - b) heavy metals?

 - c) radioactive substances?

 - d) humic compounds in aqueous solution?

 - e) dissolved oxygen?

 - f) pesticides form soil sample?

What kind of information is obtained by the following analyses?

- g) conductivity

- h) pH

- i) BOD₇

- j) hardness

- k) AOX

- d) alkalinity

4. A) What are the differences between municipal and industrial waste waters (3p)
B) Why water is an excellent solvent? (3p)
5. a) Explain what is the working principle of soaps and detergents (3p)
b) Inorganic carbon species in water (3p)
Epäorgaanisen hiilen esiintymismuodot vedessä (3p)
6. What is the basic principle behind the drinking water guidelines given by Finnish, EC, USEPA or WHO authorities ?
6. Mihin sosiaali- ja terveysministeriön, EU:n, USEPA:n, WHO:n jne. antamat talousveden laatuvaatimukset perustuvat (6p)
7. Pohjaveden laatuun vaikuttavat tekijät (6p)
7. Explain what factors affect the ground water quality?