



**UNIVERSITY OF SWAZILAND**  
Faculty of Health Science

Department of Environmental Health  
Sciences

Final Examination 2007/2008

Title of paper: WATER TREATMENT 11

Course code: EHS 585

Time allowed: 2 hours

Marks allocation: 100 Marks

Instructions:

- 1) Read the questions and instructions carefully
- 2) Answer Four questions
- 3) Each question is weighted 25 marks
- 4) Write neatly and clearly

This paper is not to be opened until the invigilator has granted  
permission

Main Examination: 2008

EHS 585 II

Question 1.

In a vertical-flow clarifier the following conditions are observed:

- i) Large amounts of flocs are floating near the water surface:
- ii) There is a blanket that is clearly visible. But one part is rising up much higher than the rest and coming very close to the water surface.
- iii) The clarifier seems to be working well.

Explain the significant of each observation, stating what likely cause of the observed behaviour and what action can be taken to check on or improve the operation of the clarifier. (25)

Question 2.

Discuss disinfection in Water Treatment Plant under the following:

- i) Ultra-violet Irradiation (UV) (15)
- ii) Ozonation (10)

Question 3.

- A) What are the various treatment steps required to treat water high in E. Coli and Turbidity? (5)
- B) What are the expected characteristics of the effluent to make it not objectionable to consumers? (5)
- C) What are the fundamental differences between slow and rapid filters? (5)
- D) Describe the mechanism that take place in both slow and rapid filters. (10)

Question 4.

- A) What are the good characteristics of a disinfectant? (5)
- B) What are the properties of chlorine? (5)
- C) Discuss briefly the **slug** method in distribution system of chlorination. (5)
- D) Discuss briefly the disinfection kinetics. (10)

Question 5.

- A) What do you understand by the term break-point chlorination? (10)
- B) With an aid of a diagram detail the break-point chlorination process, Explaining the difference steps involved. (15)