UNIVERSITY OF SWAZILAND

Faculty of Health Sciences

Department of Environmental Health Science

Main Examination 2011

Title of paper: WATER TREATMENT 1

Course code: EHS 584

Time allowed: 2 HOURS

Marks allocation: 100 Marks

Instructions:

1) Answer **Four (4)** questions
2) Each question is weighted 25 marks
3) Write neatly and clearly
4) Begin each question in a separate sheet of paper

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

Main Examination: December 2011

EHS 584 1

Question 1.

Physical characteristics of water are one of the main reasons why we treat water, so that we can adjust the levels of the constituents' components in the water.

Detail the characteristic elements which have an impact on water quality and also have an effect on water treatment plants. (25)

Question 2.

A) Explain the process of stability of colloidal system in water. (15)

B) What do you understand by tapered flocculation? (10)

Question 3.

A) What are the general physical parameters in raw water? (5)

B) Explain the origin and significance of each of the parameters in water treatment? (10)

C) In Water Treatment aimed at production of drinking water, what is the most important treatment step and why? (10)

Question 4.

A) What do you understand by Lamella sedimentation? (4)

B) Discuss the three (3) configurations of Lamella sedimentation tanks. (6)

C) List and explain the design points of Lamella tanks. (15)

Question 5.

A Water Treatment Plant is to process a flow of 2 3520 M^3 / d. Using the following given criteria, Design a system of rectangular horizontal flow sedimentation basin.

i) Surface Loading should not exceed $30m^3/m^2/d$ with all basins in service. (8)
ii) With one basin out of service or cleaning/ repair, the surface loading should not exceed $40m^3/m^2/d$. (5)
iii) Detention time is 1-3 hours. (8)
iv) Weir loading should not exceed $250m3/m^2/d$. (4)