UNIVERSITY OF SWAZILAND

Faculty of Health Science

Department of Environmental Health Sciences

Main Examination 2010

Title of paper: WATER TREATMENT 1

Course code: EHS 584

Time allowed: 2 hours

Marks allocation: 100 Marks

Instructions:
1) Read the questions and instructions carefully
2) Answer ANY FOUR (4) questions
3) Each question is weighted 25 marks
4) Write neatly and clearly
5) Begin each question in a separate sheet of paper

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

Question 1.

Thermal Stratification is a big problem in lakes and reservoir for water abstraction for domestic use! Discuss the process of this phenomenon, explaining how it affects the quality of water.

(25)

Question 2.

i) With the aid of a diagram, describe the principal features of a rotary drum micro strainer. (10)

ii) When would you use a microstrainer in Water Treatment Plant? (5)

iii) Explain the advantages and disadvantages of a microstrainer. (5)

iv) What is the significant of aeration in Water Treatment Plant? (5)

Question 3.

For the following water quality parameters, state briefly their significance in Public Health and Water Treatment Techniques used to control their concentrations. State also maximum acceptable levels in drinking water.

i) Temperature. (5)

ii) Turbidity. (5)

iii) Nitrates. (5)

iv) Bacteria. (10)

Question 4.

"Activated Carbon is one of the materials used in a Conventional Water Treatment Plant"

A) Discuss in details the properties of this chemical (10)

B) State for what purpose is it used for in water treatment (10)

C) How is it removed from water. (5)

Question 5.

A Water Treatment Plant is to process a flow of 2 3520 M^3 / d. Using the following 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)