



UNIVERSITY OF SWAZILAND
Faculty of Health Sciences
Department of Environmental Health Science

DEGREE IN ENVIRONMENTAL HEALTH SCIENCES
FINAL EXAMINATION PAPER 2016

TITLE OF PAPER : FUNDAMENTALS OF SEWAGE TREATMENT

COURSE CODE : EHM 213

DURATION : 2 HOURS

MARKS : 100

INSTRUCTIONS :

- : READ THE QUESTIONS & INSTRUCTIONS CAREFULLY
- : ANSWER **ANY FOUR** QUESTIONS
- : EACH QUESTION **CARRIES 25** MARKS.
- : WRITE NEATLY & CLEARLY
- : NO PAPER SHOULD BE BROUGHT INTO THE EXAMINATION ROOM.
- : BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER.

DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR.

QUESTION ONE

- a) Below is a picture of trickling filters at Nhlambeni. Discuss five usual problems associated with this kind of treatment facility. [10]



- b) Describe the three components parts of the trickling filter and their functions [12]
- c) Outline the importance of recirculation in a trickling filters [3]

QUESTION TWO

- a) Below is a picture of the stabilization ponds at Matsapa. What are the key features of this treatment method? [10]



- b) Highlight at least five disadvantages of using stabilization ponds as a waste water treatment system. [10]
- c) Describe fully the key features that set apart from each other anaerobic, facultative and maturation ponds within stabilization ponds treatment systems [5]

QUESTION THREE

- a) What are the characteristics of waste water? Give examples for each characteristic as conceptualized by Metcalf and Eddy. [20]
- b) Out of the waste water constituents as conceptualized by Metcalf and Eddy. Which ones are of serious concern and why? [5]

QUESTION FOUR

- a) Describe in detail the first step in primary treatment in a waste water treatment plant in terms of process and design [20]
- b) What is involved in tertiary treatment? [4]
- c) Is it always the case that there is tertiary treatment during waste water treatment processes? Explain [1]

QUESTION FIVE

- a) The following represents a list of constituents that are of major concern in waste water treatment. Complete the matrix to demonstrate understanding of why these constituents are really of concern. [16]

CONSTITUENT	REASONS FOR IMPORTANCE
Suspended Solids	
Biodegradable organics	
Pathogens	
Nutrients	
Priority pollutants	
Refractory organics	
Heavy metals	
Dissolved inorganics	

- b) Explain the scientific connection between nitrification and eutrophication in a waste treatment facility [5]
- c) Differentiate between BOD and COD in waste water treatment [4]