

**UNIVERSITY OF SWAZILAND  
FACULTY OF HEALTH SCIENCES**

**BACHELOR'S DEGREE IN ENVIRONMENTAL  
HEALTH SCIENCES**

**SUPPLEMENTARY EXAMINATION PAPER  
JULY 2015**

**TITLE OF PAPER** : FUNDAMENTALS OF SEWAGE  
TREATMENT

**COURSE CODE** : EHM 213

**DURATION** : 2 HOURS

**MARKS** : 100

**INSTRUCTIONS** : ANSWER ANY FOUR QUESTIONS  
: EACH QUESTION CARRIES 25 MARKS  
: NO PAPER SHOULD BE BROUGHT INTO NOR  
OUT OF 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) Outline the key features of a trickling filters as one of the modern waste water treatment system. [10]
- b) Below is a picture of the stabilization ponds at Matsapa. What are the key features of this treatment method? [10]



- c) Highlight at least five disadvantages of using stabilization ponds as a waste water treatment system. [5]

**QUESTION TWO**

- a) What are the characteristics of waste water? Give examples for each characteristic as conceptualized by Metcalf and Eddy. [20]
- b) What is the importance of primary and secondary ponds in a traditional waste water treatment facility? [5]

### QUESTION THREE

- a) There are seven conventional elements to consider in designing any waste water management and treatment facility. Discuss each element and their utility. [21]
- b) What is the importance of the following with regards to waste water treatment? [4]
1. Dissolved oxygen
  2. Oxygen demand
  3. Biochemical oxygen demand
  4. Chemical oxygen demand

### QUESTION FOUR

- a) The selection of a waste water treatment method depends on several factors. Discuss at least eight of these factors. [16]
- b) Describe the process of pretreatment in a waste treatment plant. State the likely by-products during pre treatment [5]
- c) Under what conditions is aerobic and anaerobic decomposition desired in a waste treatment plant? [4]

### QUESTION FIVE

- a) What purpose is served by the depth in a primary pond of the traditional waste water treatment plant [5]
- b) Describe the biological processes in a facultative pond [5]
- c) Define the following terms used in sewage treatment: [5]
- i. Sewerage
  - ii. Sullage
  - iii. Comminutor
  - iv. Dissolved Oxygen (DO)
  - v. Facultative
- d) The final stage in trickling filters relates to sludge disposal and effluent disposal. Discuss the main aspects of this stage and state the related dangers of not taking care of this stage. [10]
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