



TECHNICAL UNIVERSITY OF MOMBASA
**Faculty of Engineering &
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING
UNIVERSITY EXAMINATION FOR BACHELOR OF SCIENCE IN CIVIL
ENGINEERING
[Institutional Based Programmes]

ECE 2504: PUBLIC HEALTH ENGINEERING III

END OF SEMESTER EXAMINATION
SERIES: APRIL 2013
TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Answer question **ONE** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

Question One

- a) Briefly describe Aerobic Treatment units. **(5 marks)**
- b) Explain the application and design considerations of septic tank for onsite waste water treatment and draw sketch of section view through a typical 2 – compartment septic tank. **(25 marks)**
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Question Two

- a) Briefly describe solid water processing and transformation and locate the state it occurs in waste management chain. **(15 marks)**
- b) Outline **TWO** advantages and **THREE** disadvantages of using constructed wetland for treatment and disposal of waste water from a group of residential houses. **(5 marks)**

Question Three

- a) Briefly explain stabilization and thickening process as applied to sludge treatment. **(10 marks)**
- b) A treatment plant is to be designed for treatment of waste water containing 250mg/l suspended solids. Assuming 55% of these solids are removed in the sedimentation tanks; determine the volume of the sludge produced for every 1000m³ of waste water. Assuming that the sludge has moisture content of 96% and the specific gravity of solids is 1.2. Find the unit weight of the sludge. **(10 marks)**

Question Four

- a) Define the term fouling **(3 marks)**
- b) Discuss the process of waster generation and handling **(17 marks)**

Question Five

- a) Explain the term size reduction as used in solid waste. **(5 marks)**
- b) Discuss **FIVE** main processes of sludge treatment. **(15 marks)**