



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

DEPARTMENT OF BUILDING & CIVIL ENGINEERING
UNIVERSITY EXAMINATION FOR BACHELOR OF SCIENCE IN CIVIL
ENGINEERING (BSCE)

ECE 2504: PUBLIC HEALTH ENGINEERING III

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2013

TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- Answer Booklet

This paper consists of **FIVE** questions.

Answer question **ONE (COMPULSORY)** in section **A** and any other **TWO** questions from section **B**

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

SECTION A

Question One (Compulsory)

- a) What are the significance challenges associated with onsite wastewater treatment systems (OWTS) **(6 marks)**
- b) A new urban residential estate with 500 homes of average occupancy of 4.8 persons/residence and has a single central pack that has been completed. Determine if the estate may be served once a week collection by two trucks given the following data:
- Waste generated from residential homes = 2.8kg/capita
 - Park rubbish density = 130kg/m³
 - Residential rubbish = 500kg/m³
 - Truck capacity = 4.5 – 9.0m³
 - Waste generated from parks and recreational area = 0.03kg/capita/day **(6 marks)**
- c) List down the process followed in solid waste management. **(12 marks)**

- d) What are the **THREE** main waste water processes? **(6 marks)**

SECTION B (Attempt any TWO questions)

Question Two

- a) Discuss constructed wetlands as wastewater treatment method citing their advantages and disadvantages. **(12 marks)**
b) What factors should one consider in landfill siting? **(8 marks)**

Question Three

- a) Define salinity. Why is it important to crops? **(10 marks)**
b) Briefly explain the process of combustion in solid waste management process. **(10 marks)**

Question Four

- a) What are the **FIVE** primary variables that must be “controlled” during composting? **(5 marks)**
b) Discuss the proper guidelines to ensure efficiency in collection of solid waste? **(7 marks)**
c) Discuss thickening and composting as used in sludge processing. **(8 marks)**

Question Five

- a) Define screening as used in solid waste management. What are the main objectives of screening? **(4 marks)**
b) Differentiate between Hauled container system (HCS) and stationary container system (SCS) in solid waste management. **(4 marks)**
c) Discuss the following under landfills:
- Site preparation
- Placement of wastes
- Land fills
- Functions of cover material in a cell in land filling **(12 marks)**