



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY  
DEPARTMENT OF BUILDING & CIVIL ENGINEERING

**UNIVERSITY EXAMINATION FOR:**  
**BACHELOR OF SCIENCE IN CIVIL ENGINEERING**

ECE 2504 : PUBLIC HEALTH ENGINEERING III

END OF SEMESTER EXAMINATION

**SERIES:** DECEMBER 2016

**TIME:** 2 HOURS

**DATE:**

**Instructions to Candidates**

You should have the following for this examination

-*Answer Booklet, examination pass and student ID*

-*Drawing instruments.*

This paper consists of five questions.

Attempt any THREE questions.

**Do not write on the question paper.**



### Question ONE (Compulsory)

- a). Explain the term salinity. Why is it important to plants (6 Marks).
- b). Discuss the processes involved in solid waste management chain (14 Marks).
- c). Explain the advantages and disadvantages of biogas production (10 Marks).

### Question TWO

- a). What is onsite waste water treatment system (OWTS). Discuss the main challenges and problems associated with this system (12 Marks).
- b). Make short notes on the following:
  - i). Metallic corrosion
  - ii). Biological growth
  - iii). Scaling concern
  - iv). Fouling (8 Marks).

### Question THREE

- a). What are the main principle issues regarding composting, design and control (5 Marks).
- b). Discuss factors that must be considered in siting of a land fill (8 Marks).
- c). Outline the guidelines required when making decisions on the collection routes of the Municipal Solid Waste (7 Marks).

### Question FOUR

- a). Discuss the process involved in windrow composting (9 Marks).
- b). A new urban residential estate with 600 homes averaged occupancy of 4.8 person per residence and a single central park has been completed. Determine if the estate may be served by once a week collection by two trucks. The other details were provided as follows:
  - Waste generation for parks and recreational areas = 0.03 kg/cap.day
  - Waste generation for the residential homes = 1.9 kg/capita
  - Park rubbish density = 150 kg/m<sup>3</sup>
  - Residential rubbish = 400 kg/m<sup>3</sup>
  - Capacity for the truck = 6.0 – 10.5 m<sup>3</sup> (5 Marks).
- c). Discuss wastewater treatment processes (6 Marks).



### **Question FIVE**

- a). Citing the potential concern, discuss the urban re-use of waste water (12 Marks).
- b). Define the term REFUSE (1 Mark).
- c). Explain the process of vemi-composting (7 Marks).

