



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT BUILDING AND CIVIL ENGINEERING

**UNIVERSITY EXAMINATION FOR:**

**BSC IN CIVIL ENGINEERING**

**ECE 2504: PUBLIC HEALTH ENGINEERING III**

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2016**

**TIME: 2 HOURS**

**DATE: 16 May 2016**

## **Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, Drawing Instruments, Scientific calculator, examination pass and student ID*

This paper consists of five questions. Attempt question ONE (Compulsory) and any other TWO questions.

## **Question ONE (Compulsory)**

- a). Citing advantages and disadvantages of Stationary Container System (SCS) and Hauled Container System (HCS) discuss these two types of collection systems (16 Marks).
- b). Discuss the main challenges facing the implementation of OWT system and the problems associated with the system (10 Marks).
- c). What are the advantages of constructed wetlands? (4 Marks).

### Question TWO

- a). Describe the process of windrow composting?. Make short notes under the following subtopics regarding windrow composting:
- i). Climate consideration
  - ii). Environmental concerns
  - iii). Requirements for windrow composting (12 Marks).
- b). Discuss sludge water re-use (8 Marks).

### Question THREE

- a). Why is salinity important to plants (12 Marks).
- b). Discuss sludge re-use (8 Marks)

### Question FOUR

- a). A new urban residential estate with 1000 homes averaged occupancy of 5.8 person per residence had a single central pack. Can the estate be served by two trucks once a week? The details for the question are provided as follow:
- Waste generation for packs and recreational areas = 0.03 kg/Capita.day
  - Waste generation for residential homes = 1.8 kg/Capita
  - Park rubbish density = 150 kg/m<sup>3</sup>
  - Residential rubbish = 450 kg/m<sup>3</sup>
  - Capacity for the truck = 5.0 – 12 m<sup>3</sup> (6 Marks).
- b). Discuss wastewater treatment processes (6 Marks).
- c). What do you understand by the term vermicomposting (8Marks).

### Question FIVE

- a). Mentioning different types of combustors, discuss the process of combustion and cite its potential concern (13 Marks).
- b). What are the main objectives of composting? (4 Marks).
- c). What factors contribute to the generation rates of solid waste? (3Marks).