



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

((A Constituent College of JKUAT)

(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE IN
CIVIL ENGINEERING

EBC 2504: PUBLIC HEALTH ENGINEERING III

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2012

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 (COMPULSORY)** 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 (Compulsory - 30 Marks)

- a) Discuss briefly the three major technologies in waste water treatment **(6 marks)**
- b) Define salinity. Why is it important to crops? **(12 marks)**
- c) A new urban residential estate with 600 homes of average occupancy of 4.8 person/residence and a single central park has been completed. Determine if the estate may be served by once a week collection by two truck given the following details.
- Waste generation for Parks and Recreational area = 0.02kg/Capita/Day
 - Waste Generated from residential homes = 1.8kg/Capita
 - Park rubbish density = 130kg/m³
 - Residential rubbish = 400kg/m³

- Capacity for a truck = 4.5 – 9.0m³ (6 marks)

d) Differentiate between Hauled Container System and Stationary Container System. (6 marks)

Question Two (20 marks)

a) Discuss the **FIVE** main processes of sludge treatment. (15 marks)

b) Explain the term size reduction as used in solid waste. (5 marks)

Question Three (20 marks)

a) Mention factors that affect the generation rates of solid waste. A proposed plastic recycling enterprise required 100t/day, 5 day/week in order to meet its goal of 8% return on investment. Calculate the feasible population size given that the per capita plastic waste is 0.15t/capita. (5 marks)

b) Define the term Onsite Wastewater Treatment System (OWTS) as used in wastewater treatment. What are the main challenges associated with this system. (10 marks)

c) What are the main advantages of constructed wetlands for waste water treatment? (5 marks)

Question Four (20 marks)

a) Discuss the processes of water generation and handling. (18 marks)

b) Define the term fooling. (2 marks)

Question Five (20 marks)

a) Outline the parameters that must be taken in to consideration when designing sedimentation tanks. (10 marks)

b) What are the various non-potable purposes of reclaimed water as provided by the urban re-use system? (10 marks)