TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

HIGHER DIPLOMA IN BUILDING & CIVIL ENGINEERING (HDBCE 12S)

EBC 3209: PUBLIC HEALTH ENGINEERING II

END OF SEMESTER EXAMINATION
SERIES: APRIL 2014
TIME ALLOWED: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer booklet*

This paper consists of **FIVE** questions. Answer any **THREE** questions of the **FIVE** questions

All questions carry equal marks
Maximum marks for each part of a question are as shown
This paper consists of **TWO** printed pages

Question One

a) (I) Define a combined sewerage system
(II) State the:
(i) Advantages
(ii) Disadvantages of combined sewerage system. **(6 marks)**

b) (i) Explain the necessity of man-holes in a sewer system.
(ii) State FIVE factors that determine the location of man-holes. **(10 marks)**

c) State FOUR factors that determine choice of sewer materials. **(4 marks)**

Question Two

a) Explain the following as used in flow of waste water sewers.

(i) Dry weather flow
(ii) Wet weather flow
(iii) Peak flow
(iv) Self cleansing velocity **(8 marks)**

b) Briefly explain the THREE basic types of wastewater treatment processes. **(9 marks)**

c) State THREE main objectives of waste water treatment. **(3 marks)**

Question Three

a) With the aid of a sketch, explain the working of a septic tank. **(10 marks)**

b) Design a septic tank given the following data:
(i) Water consumption 150 litres/hr/day
(ii) Detention period 24 hours
(iii) Depth of tank 1.5m up to free board
(iv) Population 500 persons
(v) Length to breadth ratio 2:5:1 **(10 marks)**

Question Four

a) With the aid of a sketch, explain the working of a biological filter (trickling filter) **(10 marks)**

b) Briefly explain with the aid of sketch the following sewer tests:
(i) Water tests
(ii) Smoke tests **(10 marks)**

Question Five

a) Explain the operation/process in activated sludge. **(8 marks)**

b) With the aid of a sketch, explain the operation:

c) (i) Define a cess-pool

(ii) Explain the use and design requirement of a cess-pool. **(4 marks)**