



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

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

**UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN CIVIL ENGINEERING
(BSCE 13M/BSCE13A/BSCE 12J/BSCE 12M/BSCE 12MA)**

ECE 2305: PUBLIC HEALTH ENGINEERING I

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 question **ONE (COMPULSORY)** and any other **TWO** 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) State the main factors considered in assessing water demand for an urban centre, and analyze the factors which could influence this provision. **(7 marks)**
- b) Explain the causes of water and describe the following causes of impurities; of water:
(i) Suspended impurities
(ii) Dissolved impurities **(6 marks)**
- c) Explain the following methods of self-purification of river water:
(i) Dilution
(ii) Oxidation of impurities by dissolved oxygen in the water

- (iii) Plankton and other aquatic organisms
- (iv) Temperature and sunlight **(10 marks)**

d) Outline the factors to consider in the design of a sedimentation tank. **(7 marks)**

Question Two

- a) State the distinguishing properties of river and ground water. **(8 marks)**
- b) With the aid of suitable sketches, describe the following sources of water: **(12 marks)**
 - (i) Artesian wells
 - (ii) Infiltration galleries

Question Three

- a) (i) Discuss factors which influence the rate of contamination by pollutants to the ground water.
- (ii) Outline the ways in which well water is contaminated. **(8 marks)**
- b) With the aid of suitable sketches outline methods of preventing contamination of:
 - (i) A hand dug well
 - (ii) Bored well **(12 marks)**

Question Four

Outline the FOUR main classes of water associated diseases, stating in each case their causes, main types and methods of preventing the diseases. **(20 marks)**

Question Five

- a) (i) Describe the plant count test to determine the suitability of water for human consumption.
- (ii) Explain the relevance of pH value in water testing. **(10 marks)**
- b) Outline the main stages of water treatment process and show the most appropriate layout of a treatment plant. **(10 marks)**