



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

DEPARTMENT OF BUILDING & CIVIL ENGINEERING
UNIVERSITY EXAMINATION FOR BACHELOR OF SCIENCE IN CIVIL
ENGINEERING (BSCE)

ECE 2305: PUBLIC HEALTH ENGINEERING I

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2013

TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- Answer Booklet
- Pocket calculator

This paper consists of **FIVE** questions.

Answer question **ONE (COMPULSORY)** in section **A** and any other **TWO** questions from section **B**

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

SECTION A

Question One (Compulsory)

- a) Outline the main physical properties of water. **(6 marks)**
- b) With the aid of suitable sketches, describe the construction and protection of the following water sources:
- (i) Hand dug wells
 - (ii) Bored wells
 - (iii) Jetted wells **(10 marks)**
- c) Outline, water associated diseases **(8 marks)**
- d) Explain the self-purification of river water **(6 marks)**

SECTION B (Attempt any TWO questions)

Question Two

- a) Explain any **THREE** methods of removal of hardness of water **(10 marks)**
- b) Describe with the aid of suitable sketches, sanitary methods of collecting water from roof catchment **(10 Marks)**

Question Three

- a) Outline the main treatment process of water stating the various units deployed and their functions. **(10 marks)**
- b) Draw a typical layout of a water treatment plant **(10 marks)**

Question Four

- a) Explain the process of coagulation, stating the main coagulants used and their limitations **(10 marks)**
- b) Describe the following water tests:
- (i) Plant count test
 - (ii) Jar test **(10 marks)**

Question Five

- a) Outline the main design parameters for a coagulation flocculation basin. **(8 marks)**
- b) With the aid of suitable diagrams, explain the operation of:
- (i) Slow sand filters
 - (ii) Rapid sand filters **(12 marks)**