THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

HIGHER DIPLOMA IN BUILDING & CIVIL ENGINEERING

EBC 3201: PUBLIC HEALTH ENGINEERING

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 **THREE** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (20 marks)

a) State **FIVE** basic requirements of drinking water. **(5 marks**)

b) Explain why it is necessary to build water project in "phases" **(6 marks)**

c) With the aid of sketches, show **TWO** methods of diverting the first rain water running from a roof. **(9 marks)**

Question Two (20 marks)

a) Outline **FOUR** factors considered in selecting sources of water for a water supply project. **(8 marks)**

b) Compare the following sources of water with reference to quality:
   i) Rainwater from roof catchment
   ii) Streams and rivers
   iii) Water from boreholes. **(9 marks)**

c) State **THREE** factors that influence the consumption of water. **(3 marks)**

Question Three (20 marks)

a) Define the following terms as used in water treatment.
   i) Flash mixing
   ii) Flocculation
   iii) Coagulation
   iv) Clarification **(8 marks)**

b) With the aid of a well labeled diagram, illustrate an upward flow setting tank (hopper type) that may be used after coagulation. **(8 marks)**

c) Outline **TWO** functions of a service reservoir in a water distribution system. **(4 marks)**

Question Four (20 marks)

a) State **FOUR** objectives of aeration in water treatment **(4 marks)**

b) Outline **FOUR** reasons for storing raw water before treatment. **(8 marks)**

c) Sketch and label the following types of aerators:
   i) Multiple tray aerators
   ii) Multiple-platform aerator. **(8 marks**)

Question Five (20 marks)

a) Briefly describe any **FOUR** processes that occur during filtration of water. **(8 marks)**

b) Sketch a service reservoir (tank) showing the following features:

i) Vent pipe

ii) Inlet pipe
iii) Outlet pipe
iv) Overflow pipe
v) Washout **(8 marks)**

c) State **FOUR** factors that influence disinfection of water. **(4 marks)**