



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

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECE 2513: WATER RESOURCES ENGINEERING II

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2013

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 **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

Question One (Compulsory)

- a) State **THREE** parts of a typical and complete water code. **(3 marks)**
- b) Describe the doctrine of riparian rights **(4 marks)**
- c) Explain the defects the riparian doctrine has in modern society **(12 marks)**

- d) Outline SIX factors that constrain the construction of accurate models in water resources planning. **(11 marks)**

Question Two

- a) Describe FIVE goals to be achieved in water planning at the national level **(5 marks)**
b) Describe the environmental consequences of water resource projects **(15 marks)**

Question Three

- a) Describe the management of reservoir systems **(10 marks)**
b) Describe the major criticisms with contract problem approach for water supply. **(10 marks)**

Question Four

- a) Describe when it is necessary to formulate an optimization problem. **(2 marks)**
b) Show how climate change will exacerbate an already precarious situation, creating a vicious cycle of destructive weather phenomena in the arid and semi-arid northern Kenya. **(16 marks)**
c) Outline the mitigation measures that are available. **(2 marks)**

Question Five

- a) Describe the major role played by water law in the economic aspects of water development. **(7 marks)**
b) Describe the term “Integrated Water Resources Planning” **(3 marks)**
c) Outline the guiding principles for IWRM **(10 marks)**