



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

**UNIVERSITY EXAMINATION FOR:**

**BSC IN CIVIL ENGINEERING**

**ECE 2513 : WATER RESOURCES ENGINEERING II**

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2016**

**TIME: 2 HOURS**

**DATE: 10 May 2016**

## **Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, Drawing Instruments, Scientific calculator, examination pass and student ID*

This paper consists of five questions.

Attempt question ONE (Compulsory) and any other TWO questions.

## **Question One (Compulsory)**

- a) Optimization models for hydraulic management for ground water have been developed based on three approaches: describe them **(10 marks)**
- b) Describe the main objective of flood control **(3 marks)**
- c) Briefly explain why water is becoming a scarce commodity. **(3 marks)**
- d) Enumerate the rights the owner of land adjacent to a stream is entitled to receive **(3 marks)**
- e) Describe the serious defects the riparian doctrine has in modern society **(4 marks)**
- f) Enumerate the parameters to be measured in water quality **(5 marks)**
- g) What other additional information shall be needed if the objective is to evaluate the influence of pollution control measures on the cost of water treatment **(2 marks)**

### **Question Two**

- a) Describe the two steps in an engineering economy study (5 marks)
- b) Describe in your understanding the meaning of integrated water resource planning and management (15 marks)

### **Question Three**

- a) Briefly describe TWO functions of an aquifer. (5 marks)
- c) Define transmissibility T (5 marks)
- d) The riparian owner is protected against any adverse effects by the upstream owner, describe them (10 marks)

### **Question Four**

- a) Write the formula for the required storage of a dam and explain the elements that are involved (3 marks)
- b) Enumerate the five basic subsystems which characterize the urban drainage system (10 marks)
- c) Describe three assumptions and constraints used in storm water design (7 marks)

### **Question Five**

- a) Describe as to how flood control is normally done (10 marks)
- b) What is your understanding of flood plain management? (7 marks)
- c) Who is a riparian farmer? (3 marks)