



TECHNICAL UNIVERSITY OF MOMBASA

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SCHOOL OF ENGINEERING AND TECHNOLOGY  
DEPARTMENT OF BUILDING & CIVIL ENGINEERING  
UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN CIVIL ENGINEERING  
ECV 4515 : WATER RESOURCES 1

SPECIAL/SUPPLEMENTARY EXAMINATION  
SERIES: JULY 2025

TIME: 2 HOURS

**PAPER B**

**Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of **five** questions.

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

**Do not write on the question paper.**

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**QUESTION ONE (COMPULSORY) 30 Marks**

- a) Explain the factors to consider when selecting a site for water reservoir  
( 10 marks)
- b) Outline the potential solutions in the challenges of water resources management  
(6 marks)
- c) Sketch the following types of spillways
  - i) Ogee
  - ii) Chute
  - iii) Shaft
  - iv) Siphon (4 marks)
- d) Sketch a section of a dam and indicate the storage zone and sluice way  
(6 marks)
- e) State four roles of NEMA in water resources (4 marks)

**ANSWER ANY TWO QUESTIONS FROM THIS SECTION**

**QUESTION TWO (20 Marks)**

- a) Explain the term trap efficiency of reservoir in water resources (6 marks)
- b) Explain the removal of sediments in reservoirs (4 marks)
- c) Water Law is an essential tool in water resource, explain (6 marks)
- d) Differentiate perched aquifer from confined aquifer (4 marks)

### **QUESTION THREE (20 Marks)**

- a) Sketch and outline the following
  - i) Radial gate
  - ii) Drum gate (6 marks)
- b) Explain the procedure of determining reservoir capacity by mass curve method (10 marks)
- c) Outline Integrated Water Resources Management(IWRM) (4 marks)

### **QUESTION FOUR (20 Marks)**

- a) Explain ground water recharge (6 marks)
- b) State four advantages of water reservoirs (4 marks)
- c) Outline the following
  - i) Specific yield
  - ii) Aquifer
  - iii) Name three aquifers in Kenya
  - iv) Watershed
  - v) Water resource management(WRM) (6 marks)
- d) State four side effects of dams as water impounding structure (4 marks)

### **QUESTION FIVE (20 Marks)**

- a) Explain the importance of new technologies in water resource management (6 marks)
- b) Explain the main strategies in water resources (4 marks)
- c) Name the mode of failures in both gravity and earth dams (4 marks)
- d) Sketch the following un controlled spillways
  - i) Chute
  - ii) Shaft
  - iii) Ogee (6 marks)

