



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY

Department of BUILDING & Civil engineering

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECV 4513 : WATER RESOURCES ENGINEERING 11

END OF SEMESTER EXAMINATION

SERIES: JANUARY 2025

TIME: 2 HOURS

PAPER A

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.

QUESTION ONE (COMPULSORY) 30 Marks

- a) Outline drought and the following four main causes
 - i) Climate change
 - ii) El Nino and La Nina
 - iii) Deforestation
 - iv) Overuse of water resources (10 marks)
- b) Explain the severe impacts of drought and the mitigations to reduce the impacts (12 marks)
- c) Outline the four types of drought (8 marks)

ANSWER ANY TWO QUESTIONS FROM THIS SECTION

QUESTION TWO (20 Marks)

- a) Explain the four water harvesting methods (10 marks)
- b) Integrated Water Resources Management (IWRM) an asset for the present and future generation. Explain (10 marks)

QUESTION THREE (20 Marks)

- a) Outline the following
 - i) Challenges in water resources management
 - ii) Three principles of integrated water resources management (10 marks)
- b) Explain the importance of Water Law in integrated water resource management (10 marks)

QUESTION FOUR (20 Marks)

- a) Explain the four types of dikes built in deltaic areas (9 marks)
- b) Explain the advantages and disadvantages of ground water as a storage medium (6 marks)
- c) Outline why water resources managers should control use of water at National and County level (5 marks)

QUESTION FIVE (20 Marks)

- a) Explain the aspects of integrated water resource management (10 marks)
- b) Explain the benefits of transboundary water cooperation through participatory process in water basins (6 marks)
- c) Outline the agricultural techniques for conserving water (4 marks)

