



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY

Department of BUILDING & Civil engineering

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECV 4504 : WATER RESOURCES ENGINEERING I

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) State the challenges facing water resources management and the outline the potential solutions to the challenges (10 marks)
- b) Spillways are parts of dams.
 - i) Differentiate the two types
 - ii) Use sketches to identify, Ogge, Chute and Shaft spillways (10 marks)
- c) Explain the importance of outlet works in dams (6 marks)
- d) Dams are structures in water resources. Outline their side effects (4 marks)

ANSWER ANY TWO QUESTIONS FROM THIS SECTION

QUESTION TWO (20 Marks)

- a) Outline the following
 - i) Un confined aquifer
 - ii) Confined aquifer
 - iii) Perched aquifer (8 marks)
- b) Water resources managers regard dams as useful structures. Outline the need for dams in water resources management (6 marks)

- c) With the aid of sketches outline the different water storage zones in dams (6 marks)

QUESTION THREE (20 Marks)

- a) Explain the factors to consider when locating a site for water reservoirs
(10 marks)
- b) Explain how new technologies have benefited water resources management sector
(6 marks)
- c) State the roles of NEMA in water resources management (4 marks)

QUESTION FOUR (20 Marks)

- a) Explain the procedure for planning water reservoirs (6 marks)
- b) Explain the trap efficiency in trapping sediments in water storage facilities
(4 marks)
- c) Explain the major threats and challenges in water resources (6 marks)

QUESTION FIVE (20 Marks)

- a) Explain the water resource management concept and in relation to climate change
(4 marks)
- b) With the aid of a sketch explain reservoir sedimentation (10 marks)
- c) With the aid of sketches outline the radial gate and drum gate spillways
(6 marks)

