



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: AUGUST 2024

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 the importance of dams in water resources and state side effects to the environment (10 marks)
- b) Outline the challenges facing water resources and their solutions (8 marks)
- c) Sketch a cross section of a dam and show the different storage zones in the reservoir (6 marks)
- d) Explain trap efficiency of sediments in a reservoirs (6 marks)

ANSWER ANY TWO QUESTIONS FROM THIS SECTION

QUESTION TWO (20 Marks)

- a) With the aid of a sketch explain the occurrence of sedimentation of a reservoir (10 marks)
- b) Explain the factors to consider when selecting a site for dam construction (10 marks)

QUESTION THREE (20 Marks)

- a) Explain the following
 - i. Uncontrolled spillways and sketch the ogee, chute and shaft spillways (5 marks)
 - ii. Controlled spillways and sketch the radial and drum types (5 marks)
- b) Explain the importance of outlet work (sluiceways) in dams (6 marks)
- c) State four benefits of reservoirs (4 marks)

QUESTION FOUR (20 Marks)

- a) Explain ground water recharge (6 marks)
- b) With the aid of a sketch explain unconfined and confined aquifers (6 marks)
- c) Explain the contribution of watershed to ground water (4 marks)
- d) Explain the following
 - i. Perched aquifer
 - ii. Aquifer
 - iii. Aquitard (4 marks)

QUESTION FIVE (20 Marks)

- a) Explain population increase versus water resource (6 marks)
- b) Explain the steps to follow when planning for a water reservoir (8 marks)
- c) Outline the general methods of computing for flood storage (6 marks)