



## 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 4317** HYDROLOGY 1

END OF SEMESTER EXAMINATION

**SERIES: JANUARY 2025**

**TIME: 2 HOURS**

### 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)

(30marks)

- a) Using illustrations, describe the hydrological cycle. (10marks)
- b) A swimming pool has a water temperature of  $25^{\circ}$  and a saturation humidity ratio of  $0.02\text{kg/kg}$ . With an air temperature of  $25^{\circ}$  and 50% relative humidity, the humidity ratio in the air is  $0.0098\text{ kg/kg}$ . For a  $25\text{m} \times 20\text{m}$  swimming pool and  $0.5\text{ m/s}$  air velocity above the surface. Calculate; -
- The rate of Evaporation.
  - The Evaporation heat supply required to maintain the temperature of the water. (Evaporation heat of water  $h_{we} = 2257\text{ kJ/kg}$ .) (4marks)
- c) Describe the factors affecting evaporation rate. (6marks)
- d) Outline the components of the hydrologic cycle. (10marks)

ANSWER ANY TWO QUESTIONS FROM THIS SECTION

### QUESTION TWO

(20 Marks)

- Briefly discuss types of runoff. (6marks)
- Using illustrations, discuss TWO (2) modes of presenting rainfall data. (10marks)

c) Explain Evapo-transpiration. (4marks)

**QUESTION THREE (20 Marks)**

a) Using illustrations, describe a rain gauge as a rainfall measurement tool.(10marks)

b) Describe factors affecting infiltration rate. (6marks)

c) Describe rating curves. (4marks)

**QUESTION FOUR (20 Marks)**

a) Discuss five (5) climatic and five (5) physiographic runoff factors. (10marks)

b) Describe the difference between precipitation types and forms. (10marks)

**QUESTION FIVE (20 Marks)**

a) Discuss the relationship between rainfall and runoff. (10marks)

b) Describe two types of Evaporimeters. Use illustrations (10marks)