



TECHNICAL UNIVERSITY OF MOMBASA

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.

QUESTION ONE (COMPULSORY)

(30marks)

- a) Using illustrations, describe the hydrological cycle. (10marks)
- b) A swimming pool has a water temperature of 25° and a saturation humidity ratio of 0.02kg/kg . With an air temperature of 25° and 50% relative humidity, the humidity ratio in the air is 0.0098 kg/kg . For a $25\text{m} \times 20\text{m}$ swimming pool and 0.5 m/s air velocity above the surface. Calculate; -
 - i) The rate of Evaporation.
 - ii) 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)

- a) Briefly discuss types of runoff. (6marks)
- b) 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)**