



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY
Department of BUILDING & Civil engineering
UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN CIVIL ENGINEERING
ECV 4423 : IRRIGATION ENGINEERING II

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: NOVEMBER 2024
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 **four** questions.

Attempt **question ONE (Compulsory) and any other TWO questions.**

Do not write on the question paper.

QUESTION ONE

- a) Define subsurface drainage. **(5 marks)**
- b) Briefly explain how to make an irrigation system efficient. **(5 marks)**
- c) Outline the purpose of the main intake structure and explain if the water source lies below the level of the irrigation fields. **(5 marks)**
- d) Discuss the Parshall flume and mention the other flume why it is preferred to this one. **(5 marks)**
- e) Briefly discuss;
 - (i) How excess water is removed in irrigation.
 - (ii) How excess groundwater is removed. **(10 marks)**

QUESTION TWO

- a) Describe the sophisticated methods of water application in irrigation. **(5 marks)**
- b) Briefly explain importance of drainage system in irrigation. **(5 marks)**
- c) Discuss excess water in irrigation. **(5 marks)**
- d) Describe the types of drainage in irrigation engineering. **(5 marks)**

QUESTION THREE

- a) What is furrow irrigation. **(7 marks)**
- b) Briefly explain the border irrigation. **(6 marks)**
- c) Describe Basin irrigation and its application. **(7 marks)**

QUESTION FOUR

- a) Describe a complete inventory of the conditions under which the pump will operate or take place. **(7 marks)**
- b) Outline how the flow rate and total dynamic head are determined. **(6 marks)**
- c) Briefly explain “Head” refer to in basic pump operating characteristics. **(3 marks)**
- d) Define total dynamic head. **(4 marks)**

QUESTION FIVE

- a) Briefly explain components of the suction head. **(5 marks)**
- b) Describe cavitation. **(5 marks)**
- c) When does cavitation occur. **(5 marks)**
- d) Describe a horizontal centrifugal pump with the aid of a diagram and they are the most common irrigation systems. **(5 marks)**