



"Investing in Africa's future"

**COLLEGE OF HEALTH AGRICULTURE AND NATURAL
SCIENCES**

NAAE 402 IRRIGATION AND WATER MANAGEMENT

END OF FIRST SEMESTER EXAMINATION

APRIL 2026

LECTURER: MS M. C. KUREHWATIRA

DURATION: 3 HRS

INSTRUCTIONS

Answer all questions in Section A and any **three** from Section B

Section A carries **40 marks** and each question in section B carries **60 marks**.

SECTION A: Answer **all** questions from this section.

Question 1

Africa University is transforming its teaching and research farm into a commercially viable and sustainable production unit that will operate throughout the year. As an irrigation consultant,

- a) Recommend the most appropriate irrigation system for the university farm. In your answer, clearly describe and justify the factors that motivated your selection. [20]
- b) Discuss the importance of irrigation scheduling to the university farm. [10]
- c) Explain the concept of irrigation efficiency and discuss practical strategies the farm can adopt to improve efficiency in its irrigation system. [10]

[40]

SECTION B: Answer any **three** (3) questions from this section.

Question 2

Give a detailed explanation of the steps needed to determine the irrigation water need for a crop of your choice. [20]

Question 3

- a) With the aid of a diagram, describe the hydrological cycle, highlighting its importance in irrigation water management. [10]
- b) Discuss the challenges faced with irrigation development in Africa. [10]

Question 4

- c) With the aid of a diagram, describe the phases of a surface irrigation event. [10]
- d) Compare and contrast surface irrigation and drip irrigation. [10]

Question 5

With the aid of a diagram, describe the sprinkler irrigation systems layout. In the description, include the function of each main component. [20]

Question 6

- a) A wheat crop has a reference evapotranspiration (ET_0) of 5 mm/day. The crop coefficient (K_c) for its current stage is 1.2. Calculate the crop water requirement (ET_c). [4]
- b) Discuss the factors that affect the crop water requirement for wheat. [10]
- c) Describe any two irrigation scheduling methods you would recommend for this crop. [6]

END OF QUESTION PAPER!!!