



# UNIVERSITY OF EMBU

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2016/2017 ACADEMIC YEAR

SECOND SEMESTER EXAMINATION

THIRD YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN  
AGRICULTURE/ HORTICULTURE

AEB 302: IRRIGATION WATER MANAGEMENT

**DATE: APRIL 6, 2017**

**TIME: 2:00-4:00PM**

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**INSTRUCTIONS:**

**Answer Question ONE and ANY other TWO Questions**

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**QUESTION ONE**

- a) Explain how the soil structure is related to water infiltration. [3 Marks]
- b) Explain why it is desirable sometimes to lower the water table. [3 Marks]
- c) How many litres of water are required in order to apply 31 mm of water to a 15 by 15 metre plot of land? [3 Marks]
- d) How does the rain intensity affect the amount of moisture eventually retained in the soil? [3 Marks]
- e) Describe the three major components of an overhead irrigation system. [3 Marks]
- f) What is referred to as a standard ET crop index and how does it relate to the ET of other crops grown in the same region? [3 Marks]
- g) Describe the process by which salt concentration in the soil increase as a result of irrigation. [3 Marks]
- h) Differentiate horticultural crops from most grain crops in terms of water needs at later stages of their growth. [3 Marks]
- i) Explain the effect of temperature on evapotranspiration. [3 Marks]
- j) Use a sketch to describe water application in a furrow irrigation system. [3 Marks]

**QUESTION TWO:**

- a) With the aid of a cross-sectional drawing explain the basic arrangement of the basin, canal, drain and road network in basin irrigation systems. [10 Marks]
- b) Using normal water application schedule and machinery use, explain why it might not be possible to do all the rotorvation within a week in the Mwea irrigation scheme. [10 Marks]

**QUESTION THREE**

Give a detailed discussion of ten advantages a sprinkler irrigation system. [20 Marks]

**QUESTION FOUR**

- a) State four advantages of the basin irrigation systems over overhead systems. [4 Marks]
- b) Discuss the variation in water application rates with the percentage slope in furrow irrigation systems. [8 Marks]
- c) Discuss two factors other than the slope (in Q4 (b)) that significantly affect the design of furrow irrigation systems. [8 Marks]

**QUESTION FIVE**

- a) Discuss the functions of the following types of irrigation systems.
- i) Bucket irrigation system [5 Marks]
  - ii) Drip irrigation [5 Marks]
- b) Discuss the advantages of open and piped drainage systems [10 Marks]

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