SU

UNIVERSITY OF SWAZILAND
SUPPLENTARY EXAMINATION PAPER

PROGRAMME: DIP AGRIC III & DIP AGRIC ED. III

COURSE CODE: LUM 303

TITLE OF PAPER: IRRIGATION

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO OTHER QUESTIONS.

DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE CHIEF INVIGILATOR

SECTION I: COMPULSORY QUESTION

QUESTION 1

(a) Describe the importance of infiltration data in irrigation (15 marks)

(b) An area of 1 hectare was irrigated in 10 hours from a stream at 30 litres per second. The depth of the root zone was 1 m and the available moisture holding capacity was 0.160 cm^3cm^{-3}. The field was irrigated when 60 % of the available moisture was depleted. Water application efficiency was 65 %. Determine the water storage efficiency. (25 marks)

SECTION II: ANSWER TWO QUESTIONS FROM THIS SECTION

QUESTION 2

Describe how you would carry out a field test to assess the amount of moisture at field capacity of a soil. (30 marks)

QUESTION 3

A soil from an irrigated field has initial water content of 21 % by volume and its moisture content at field capacity is 26 % by volume. The irrigation application efficiency is 80 %. The soil profile is homogeneous throughout the top 2 metres. The effective root zone of the crop is 80 cm.

a) If a 30-mm irrigation is applied at this time, how deep will it wet the soil? (20 marks)

b) How much irrigation is needed to wet the entire root zone depth? (10 marks)

QUESTION 4

Discuss how you assess the uniformity of water application of a sprinkler irrigation system. (30 marks)