MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2012/2013

FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF MASTER OF SCIENCE IN HORTICULTURE

SHC 827: IRRIGATION TECHNOLOGY

Date: 24th July, 2013 *Time: 8.30 – 11.30 a.m.*

SHC 827: IRRIGATION TECHNOLOGY

DATE: ...????... TIME: ????

INSTRUCTIONS:
This paper comprises sections A and B.
Answer ALL questions in section A and any THREE questions in section B.

SECTION A: *Answer ALL questions in this section.*

QUESTION 1: Define the following concepts and explain their significance in irrigated planning.

(a) Net irrigation requirement
(b) Gross irrigation requirement
(c) Irrigation interval
(d) Desired design capacity (10 Marks)

QUESTION 2:
Explain clearly the components of total dynamic head for a sprinkler irrigation system

(10 Marks)

QUESTION 3.
What is the significance of the following components in a typical pump assembly.

(a) Pressure gauge
(b) Air release valve
(c) Gate valve
(d) Non-return valve
(e) By-pass

(10 Marks)

QUESTION 4.

Briefly describe the functions of the following components of a drip irrigation system.

(a) Chemical injection system
(b) Filtration system
(c) Flush valves
(d) Backflow prevention device

(10 Marks)

SECTION B: *Answer any Two questions in this section. Each question carries 20 marks.*

QUESTION 5

Discuss the most important aspects to consider in the design a sprinkler irrigation system.

(10 Marks)

QUESTION 6

A 12 Hectare farm is to be irrigated with a sprinkler system. The rootzone depth is 0.8 metres and the field capacity for the soil is 26% while the permanent wilting point is 14% by weight. The soil bulk density is 1.36 gcm^{-3} and the water application efficiency is 70%. The soil has to be irrigated when 50% of the available water is depleted. The peak evapotranspiration is 4 mm/day and the system is to be run for 10 hours.

Determine:

(a) The net irrigation depth.
(b) Gross irrigation (depth of water to be pumped)
(c) Irrigation period
(d) Area to be irrigated per day
(e) The system capacity

(10 Marks)

QUESTION 7

Discuss ten challenges facing irrigation development in Kenya.

(10 Marks)

QUESTION 8

Discuss the problems of soil salinity and sodicity and explain how such soils can be reclaimed and managed under irrigation production.

(10 Marks)