



MASENO UNIVERSITY
UNIVERSITY EXAMINATIONS 2013/2014

**THIRD YEAR SECOND SEMESTER EXAMINATIONS FOR THE
DEGREE OF BACHELOR OF SCIENCE IN EARTH SCIENCES WITH
INFORMATION TECHNOLOGY
(MAIN CAMPUS)**

NGA 310 SURFACE IRRIGATION SYSTEMS

Date: 21st July 2014

Time: 8.30 – 10.30 a.m

INSTRUCTIONS:

- Answer Question ONE (1) and any other TWO (2) questions
- Illustrations should be used where appropriate



NGA 310 SURFACE IRRIGATION SYSTEMS

1. (a) Discuss the socio-economic and ecological impacts of irrigation. 12 marks
 (b) Examine various types of surface irrigation systems. 8 marks
 (c) Explain the concept of soil-plant-atmosphere continuum. 10 marks
2. Examine methods used in determining soil moisture content. 20 marks
3. (a) Write concise notes on water conservation in an irrigated land. 12 marks
 (b) Examine the components of an irrigation system. 8 marks
4. (a) Explain any two methods used in determining the reference crop evapotranspiration (ET_o) 14 marks
 (b) The readings of the water depth in a Colorado evaporation pan were given as 125mm and 140mm respectively in two consecutive days. The readings were taken at 8.00 am of each day. During this period there was rainfall amounting to 7 mm. determine the reference crop evapotranspiration given that the pan coefficient (K_{pan}) is 0.8. 6 marks
5. Discuss the criteria used for the selection of an irrigation system. 20 marks
6. (a) Examine ways used in determining the irrigation schedule for a crop. 12 marks
 (b) Determine the irrigation schedule for groundnuts based on the growing period given the following data
 Soil type: Loam
 Irrigation Method: Furrow
 Field application efficiency: 60%
 Total growing period: 130 days
 Root depth: 40mm
 Planting date: 15th July

Irrigation water need (IN)

Month	July	Aug	Sept	Oct	Nov
IN (mm/Month)	38	115	159	170	45

6 marks