



MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

**THIRD YEAR FIRST SEMESTER EXAMINATIONS FOR THE
DEGREE OF BACHELOR OF SCIENCE IN AGRONOMY AND
ANIMAL SCIENCE WITH INFORMATION TECHNOLOGY**

MAIN CAMPUS

AAG 301: CROP ECOLOGY AND AGROMETEOROLOGY

Date: 2nd December, 2016

Time: 8.30 - 11.30 am

INSTRUCTIONS:

- Answer ALL questions in SECTION A and any THREE questions in SECTION B.



TIME 3.00 HRS (TOTAL MARKS 70)

INSTRUCTIONS:

Answer ALL the questions in section A and any THREE questions in section B. Section A is 40 Marks while section B is 30 Marks.

Section A: Answer ALL the questions in this section. This section is 40 marks.

Question 1:

- a) Using four examples account for the relevance of agroecology in sustainable agriculture. (4 Marks)
- b) Outline the four principles of agroecology? (4 Marks)
- c) Briefly discuss the role of agrometeorology as it relates to the following parameters in crop growth and development.
 - i. Temperature (Cardinal Temperatures) (6 Marks)
 - ii. Solar radiation (Photosynthetically Active Radiation) (2 Marks)
- d) Explain two strategies which can be used to manage crop microclimate to minimize non useful water loss in cropping. (4 Marks)
- e) What is the significance of crop canopy architecture in the interception of PAR and radiation use efficiency (Specifically discuss erect and non-erect types)? (4 Mark)
- f) Explain why sugarcane grown in Kwale County at the coast matures earlier than that grown in the sugarbelt of Muramba in Western Kenya? (4 Marks)
- g) Define the concept of lead time in seasonal forecasts and their significance in farmer preparedness. (4 Marks)
- h) Briefly discuss the Temperature Humidity Index (THI) and its significance in determination of annual comfort. (4 Marks)
- i) What is rainfall intensity and why it is crucial to relate it to soil intake rates both under rainfed and irrigation conditions? (4 Marks)

Section B (30 Marks): Answer THREE questions in this section. Each question is 10 Marks.

Question 2(10 MARKS):

- a) Outline five agro ecological principles which support food systems resilience. (5Marks)
- b) Distinguish between natural ecosystems and agroecosystems. (5 Marks)

Question 3 (10 Marks):

Discuss the types of climate risks and management planning associated with the following aspects of seasonal rainfall.

- i. Rainfall onsets
- ii. Dry spells
- iii. Early cessation of rainfall during the season
- iv. Length of the growing period

(10Marks)

Question 4 (10 Marks)

- a) Discuss the concepts of meteorological, agricultural and hydrological drought? (6 Marks)
- b) Outline two indices used in drought studies indicating their significance. (4 Marks)

Question 5 (10 Marks)

The Finlay's Tea Company has adopted shelterbelts in the tea plantations, while Del Monte uses plastic mulch between the pineapple plants. Discuss the agrometeorological significance of these two practices. (10 Marks)