

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**FIRST YEAR EXAMINATION FOR THE AWARD DEGREE OF
MASTER OF SCIENCE IN AGRONOMY AND MASTER OF SCIENCE IN CROP
PROTECTION AND MASTER OF SCIENCE IN HORTICULTURE**

AGRI 811: CROP PHYSIOLOGY

STREAM: M.Sc. AGRONOMY Y1 S1

TIME: 3 HOURS

DAY/DATE: THURSDAY 9/04/2020

11.30 A.M - 230 P.M.

INSTRUCTIONS:

- Answer all Questions in Section 1 and any Two questions in Section II.
- Use of calculators is allowed.
- Do not write on the question paper

SECTION A: ANSWER ALL THE QUESTIONS

QUESTION 1 (20 MARKS): COMPULSORY

- a) Using the following information, determine the photosynthetic efficiency rate of H511 grown at Embu. The hybrid yields 3850 kg/ha of grain, maize atover (leaves and stems) amount to 4389 kg / ha and root weights were estimated at 2922 kg /ha. Plant nutrients from the soil constitute about 10% of the dry weight / ha. A value of 25% was chosen as respiration losses. The energy required for synthesis of 1 kg of glucose is 15792 KJ. Estimated total solar energy striking a hectare of land during growth period at Embu is 15474 million Kj. [10 Marks]
- b) Describe how a functional balance between carbon assimilation by the shoot and nutrients and water uptake by the root exists. [10 Marks]

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION TWO (20 MARKS)

- (a) Based on free energy yield, predict the reactions that are irreversible or poorly reversible in the glycolytic pathway. [6 Marks]
- (b) Discuss the photosensory systems, detailing their effect on plant growth and development. [14 Marks]

QUESTION THREE (20 MARKS)

- a) Describe mechanisms of nutrient ion absorption in plants. [10 Marks]
- b) Discuss the radiation balance. [10 Marks]

QUESTION FOUR

- a) Discuss the cell wall biogenesis and expansion. [6 Marks]
 - b) Describe photophosphorylation [14 Marks]
-