JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

THIRD YEAR FIRST SEMESTER UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN SOIL SCIENCE

3RD YEAR 1ST SEMESTER 2017/2018 ACADEMIC YEAR

REGULAR

COURSE CODE: ALS 3315

COURSE TITLE: CROP ECO-PHYSIOLOGY

EXAM VENUE:LR 4 **STREAM: BSc. (Soil Science)**

DATE: 11/12/17 **EXAM SESSION: 9.00 – 11.00 AM**

TIME: 2 HOURS

Instructions:

1. **Answer ALL questions in section A and ANY other 2 Questions in section B.**
2. **Candidates are advised not to write on question paper.**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A: (30 MARKS) ANSWER ALL QUESTIONS IN THIS SECTION

1. a) What is meant by the term Eco physiology? (1mk)
   b) List two scientists and their main contribution in the history and development of plant ecophyslogy. (2mks)
   c) State the significance of plant ecophysicological studies. (3mks)

2. a) What do you understand by each of the following terms?
   i) Harvest index. (1mk)
   ii) Water potential. (1mk)

   b) Give four beneficial effects of environmental stress in plants. (4mks)

3. Describe briefly each of the following.
   i) Absorption of water (2mks)
   ii) Transport in: - xylem. (1mk)
   - Phloem. (1mk)

   b) State the importance of transpiration in plants. (2mks)

4. a) List three evolutionary photosynthetic pathways in plants (3mks)
   b) State three characteristics of CAM (Crassulacean Acid Metabolism) plants that enables them to inhabit arid habitats. (3mks)

5. Explain the effects of each of the following in plants :
   a) Mineral deficiency / toxicity . (2mks)

   b) Anaerobiosis. (2mks)
   c) Winds stress. (2mks)

SECTION B (40 MARKS) ANSWER ANY TWO QUESTIONS IN THIS SECTION

6. Give a detailed biochemical, anatomical and physiological account of the differences between the c3 and c4 photosynthesis. (20mks)

7. Describe adaptive mechanism of plants to each of the following environmental stresses.

   a) Water deficit. (14mks)
   b) Salinity. (6mks)
8. Discuss abiotic and biotic factors affecting the rate of transpiration in plants. (20mks)
9. Discuss adaptive responses of xerophytes to their habitat. (20mks)