



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY
SCHOOL OF BIOLOGICAL, PHYSICAL, MATHEMATICS AND ACTUARIAL SCIENCES
UNIVERSITY SPECIAL EXAMINATIONS FOR THE DEGREE OF BACHELOR OF
BIOLOGICAL SCIENCES

SECOND YEAR FIRST SEMESTER ACADEMIC YEAR 2020/2021
MAIN CAMPUS - REGULAR

COURSE CODE: SBI 3223
COURSE TITLE: PLANT PHYSIOLOGY I
EXAM VENUE: **STREAM: (BIO)**
DATE: **EXAM SESSION:**
TIME:

Instructions

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

SECTION A: SHORT ANSWER QUESTIONS (30 MARKS)

1. Explain how temperature stress affects the photosynthetic process in plants (3 marks)
2. Distinguish between apoplastic and symplastic pathways of water movement in plants (3 marks)
3. Explain the role of ABA in water stressed plants (3 marks)
4. State three functions of auxins in plants in relation to abiotic stress tolerance (3 marks)
5. Explain the term plant physiology (3 marks)
6. Differentiate between stress and strain as applied in plant physiology (3 marks)
7. State three structural mechanisms of regulating the rate of transpiration in plants (3 marks)
8. Explain how water potential, osmotic pressure and turgor pressure relate to plasmolysis (3 marks)
9. State three anatomical adaptation exhibited by xerophytes (3 marks)
10. Water stress occurs in various forms in plants. Explain three mechanisms adopted by plants to enhance tolerance to water stress (3 marks)

SECTION B: ESSAY QUESTIONS (40 MARKS)

11. Write an account of the light and dark reactions of photosynthesis in plants (20 marks)
12. Plant minerals are important for plant physiological functions
 - a. Explain the role of NPK in plant growth and development. (10 marks)
 - b. Distinguish between primary and secondary plant nutrients and give two examples of each. (10 marks)
13. Water potential is represented by the following equation: $\psi_w = \psi_s + \psi_p$.
 - a. Explain what each component of the equation stands for and write detailed notes on each part (4 marks)
 - b. Explain why transpiration is a necessary evil in plant production (6 marks)
 - c. Write a detailed explanation of the cohesion adhesion theory and active transport in plants (10 marks)
14. The most important organ to green plants is the leaf.
 - a. Draw a clearly labeled diagram showing the internal structure of a leaf

(4 marks)

b. Explain how the leaf is adapted for the process of photosynthesis

(5 marks)

c. Write short notes on photosynthetic pigments

(5 marks)

d. "Without photosynthesis, there would be no life on earth". Explain the statement.

(6 marks)