JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY

SCHOOL OF BIOLOGICAL, PHYSICAL, MATHEMATICAL AND ACTURIAL SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE AND BACHELOR OF BIOLOGICAL SCIENCES

2nd YEAR 2nd SEMESTER 2024/2025 ACADEMIC YEAR

MAIN CAMPUS - REGULAR

COURSE CODE: **SBB 1206**

COURSE TITLE: **PLANT PHYSIOLOGY**

EXAM VENUE:BOT-LAB **STREAM: BSC BIOLOGICAL SCIENCES**

DATE:14/4/25

TIME: 2 HOURS **EXAM SESSION:9-11.00 AM**

Instructions:

1. **Answer ALL questions in Section A and Any two 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

1. Describe the role of xylem and phloem in plant water transport, highlighting their differences in function. (3 marks)
2. State how transpiration contributes to water movement in plants. (3 marks)
3. How does the solute concentration affect the water potential of a solution? (3 marks)
4. State three roles of root hairs in mineral nutrition in plants. (3 marks)
5. Explain the difference between passive and active transport in mineral assimilation. (3 marks)
6. Describe three structural defenses that plants use to prevent pathogen's entry. (3 marks)
7. State three ways by which Systemic Acquired Resistance (SAR) helps plants defend themselves against pathogens. (3 marks)
8. List three types of secondary metabolites that plants produce to deter herbivores and explain their effects. (3 marks)
9. Differentiate between short-day, long-day, and day-neutral plants based on their flowering response to photoperiod. (3 marks)
10. What is vernalization, and why is it important in crop production? (3 marks)

SECTION B (40 Marks) Answer any 2 questions

11. Discuss the various defense mechanisms that plants employ against biotic stresses such as pathogens and herbivores (20 marks)
12. Compare and contrast the effects of hypotonic, isotonic, and hypertonic solutions on animal and plant cells (20 marks)
13. Discuss the different theories proposed to explain the ascent of sap in plants. (20 marks)
14. Explain the concept of water potential (Ψw) and its components. Discuss how water potential influences water movement in plant cells and its significance in plant physiology. (20 marks)