



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY**  
**SCHOOL OF BIOLOGICAL, PHYSICAL, MATHEMATICS AND ACTUARIAL**  
**SCIENCES**

**UNIVERSITY EXAMINATION FOR THE AWARD OF A DEGREE OF BACHELOR**  
**OF EDUCATION SCIENCE WITH INFORMATION TECHNOLOGY**

**4<sup>TH</sup> YEAR 1<sup>ST</sup> SEMESTER 2022/2023 ACADEMIC YEAR**

**MAIN CAMPUS - REGULAR**

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**COURSE CODE: SBB 9405**  
**COURSE TITLE: MORPHOGENESIS AND ANATOMY**  
**EXAM VENUE: STREAM: (BED.SC)**  
**DATE: 15/12/2022 EXAM SESSION: 15.00-17.00PM**  
**TIME: 2 HOURS**

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**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**
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**SECTION A: SHORT ANSWER QUESTIONS (30 MARKS)**

1. Explain the morphogenesis of the shoot apex in gymnosperms (3 marks)
2. Distinguish between three zones developed from the promeristem (3 marks)
3. Use a diagram to illustrate the longitudinal section of the root apex of a dicot plant (3 marks)
4. Describe the formation of ectomycorrhizae and endomycorrhizae (3 marks)
5. Explain three functions of modified stems (3 marks)
6. Explain three ways by which the phloem and xylem tissues of the stem are arranged (3 marks)
7. With the aid of a diagram, describe the structure of a typical anther (3 marks)
8. Explain development of the phellogen during secondary growth (3 marks)
9. Give the structural difference between hydathodes and stomata (3 marks)
10. Distinguish between floral and extra-floral nectaries (3 marks)

**SECTION B: ESSAY QUESTIONS (40 MARKS)**

11. Discuss embryo sac development and double fertilization (20 marks)
12. Describe lenticel formation during secondary growth of the stem (20 marks)
13. Discuss the morphogenesis of internal secretory tissues (20 marks)
14. Give an account of lateral root formation and differentiation (20 marks)