



**MACHAKOS UNIVERSITY**  
University Examinations for 2022/2023 Academic Year

**SCHOOL OF AGRICULTURE, ENVIRONMENT AND HEALTH SCIENCES**  
**DEPARTMENT OF AGRICULTURAL SCIENCES**  
**THIRD YEAR FIRST SEMESTER EXAMINATION FOR**  
**BACHELOR OF SCIENCE AGRICULTURAL EDUCATION AND EXTENSION**  
**BACHELOR OF EDUCATION (SCIENCE)**  
**BACHELOR OF EDUCATION (SPECIAL NEEDS)**  
**HOR 441: VEGETABLE PRODUCTION**

**DATE:**

**TIME:**

---

**INSTRUCTIONS:** Answer **Question ONE (Compulsory)** and Any other **Two** Questions.

**QUESTION ONE (COMPULSORY) (30 MARKS)**

- a) Distinguish between hot beds and cold frames (2 marks)
- b) Explain four ways of maintaining quality of vegetables during storage (4 marks)
- c) Explain FOUR methods of direct sowing of vegetables (4 marks)
- d) Explain four anti-nutritional factors in vegetables (4 marks)
- e) Describe FOUR physiological changes that occur in a seedling during hardening off (4 marks)
- f) Describe four classifications of cabbage varieties based on shape of the head. (4 marks)
- g) Explain four agronomic advantages of growing African indigenous vegetables (4 marks)
- h) Describe four characteristics of detroit dark red variety of beetroot (4 marks)

**QUESTION TWO (20 MARKS)**

- a) Describe the ecological requirements in production of onion (10 marks)
- b) Discuss five management practices in control of *Tuta absoluta* in tomatoes (10 marks)

**QUESTION THREE (20 MARKS)**

- a) Discuss five production challenges facing potato farmers in Kenya (10 marks)
- b) Describe the establishment of swiss chards in the nursery bed. (10 marks)

**QUESTION FOUR (20 MARKS)**

- a) Explain the fertigation regime in greenhouse pepper production (10 marks)
- b) Describe the ecological requirements in production of frenchbean (10 marks)

**QUESTION FIVE (20 MARKS)**

- a) Explain five ways in which beetroots can be utilised (10 marks)
- b) Describe the characteristics of four varieties of kales in Kenya (10 marks)