



# MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

FOURTH YEAR SPECIAL/ SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

BACHELOR OF SCIENCE IN AGRIBUSINESS MANAGEMENT AND TRADE

BACHELOR OF EDUCATION (SPECIAL NEEDS EDUCATION)

BACHELOR OF EDUCATION (SCIENCE)

AGR 412/KST 401: POSTHARVEST TECHNOLOGY

DATE: 24/3/2021

TIME: 2.00-4.00 PM

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## INSTRUCTIONS:

Answer question ONE and any other TWO questions

### QUESTION ONE (COMPULSORY - 30 MARKS)

- a) Postharvest handling of agricultural commodities poses a big challenge to agribusiness management and trade:
  - i. Explain **FOUR** interrelationships between postharvest physiology and postharvest technology of perishable agricultural commodities from an agribusiness view point (4 marks)
  - ii. From an agribusiness management and trade perspective, explain **FOUR** implications of postharvest technology in relation to stimulation of agricultural production (4 marks)
- b) Explain **FOUR** differences between climacteric and non-climacteric fruits and give **TWO** examples in each category (4 marks)
- c) With the aid of a well-labelled diagram for each of climacteric and non-climacteric fruits, name and show the various phases of climacteric development from initiation to senescence (6 marks)
- d) Explain **FIVE** implications of packaging harvested agricultural produce in polymeric films (5 marks)
- e) Explain **SEVEN** reasons for establishing quality standards in the marketing of agricultural commodities (7 marks)

### QUESTION TWO (20 MARKS)

- a) Explain **FIVE** expected package requirements for packaging of fresh agricultural produce (5 marks)
- b) Quality of harvested agricultural commodities has an important bearing to agribusiness management and trade:
- i. Explain the term quality with respect to harvested agricultural commodities (2 marks)
  - ii. Name the **TWO** classifications of quality components in harvested agricultural commodities (1 mark)
  - iii. Discuss **SIX** quality components with respect to harvested agricultural commodities (12 marks)

### QUESTION THREE (20 MARKS)

- a) Explain **SEVEN** functions of water in harvested agricultural commodities (7 marks)
- b) During postharvest handling of agricultural commodities, control of water loss is an important operational activity:
- i. Explain the importance of controlling water loss from harvested agricultural commodities (4 marks)
  - ii. Describe **SIX** methods used to control water loss from harvested agricultural commodities (9 marks)

### QUESTION FOUR (20 MARKS)

- a) Discuss the need for rapid cooling of harvested perishable agricultural commodities (8 marks)
- b) The maturity of harvested perishable agricultural commodities has a good correlation to product quality:
- i. Explain the need to measure the maturity of agricultural commodities (4 marks)
  - ii. Explain **FOUR** requirements of a maturity index (4 marks)
- c) Explain **FOUR** predisposing factors that may lead to development of aflatoxin in non-perishable commodities (4 marks)

### QUESTION FIVE (20 MARKS)

- a) Explain the difference between controlled atmosphere and modified atmosphere storage systems (2 marks)
- b) Modified atmosphere packaging (MAP) is increasingly being used for the storage of fresh horticultural commodities:

- i. With the aid of relevant graphical illustrations explain the **TWO** methods used to create modified atmosphere conditions (4 marks)
  - ii. Explain **SIX** positive effects of polymeric film packaging other than creation of MA conditions (6 marks)
- c) With respect to respiration of harvested agricultural commodities, discuss:
- i. **FIVE** effects of respiration in the harvested agricultural commodities (5 marks)
  - ii. **THREE** important aspects of measuring the rate of respiration in the harvested agricultural commodities (3 marks)