MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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University Examinations 2024/2025

FORTH YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN FOOD SCIENCE AND TECHNOLOGY

AAH 3400: POSTHARVEST PHYSIOLOGY OF PERISHABLE COMMODITIES

DATE: JANUARY 2025 **TIME: 2 HOURS**

INSTRUCTIONS:

1. Answer Question ONE, and any other TWO

QUESTION ONE (30 MARKS)

a) Define fruit ripening and senescence (4 Marks)

b) State any four (4) indices used to determine fresh fruits and vegetable maturity status (4 Marks)

c) Giving examples, distinguish between destructive and non-destructive methods of assessing fruit maturity (2 Marks)

d) Differentiate between horticultural maturity and physiological maturity (4 Marks)

e) State any five composition changes that take place during fruit ripening (5 Marks)

f) State five (5) postharvest management practices critical in prolonging postharvest storage life of fresh commodities (5 Marks)

g) Giving two examples each, differentiate between climacteric and non-climacteric fruits (6 Marks)

QUESTION TWO (20 MARKS)

a) Discuss ethylene biosynthesis and signaling pathway (12 Marks)

b) State factors that regulate ethylene biosynthesis (8 Marks)

QUESTION THREE (20 MARKS)

a) State four (4) compositional changes that take place during fruit ripening and methods used for their determination (8 Marks)

b) State four (4) techniques that can be used to prolong storage life of fruits after harvest (4 Marks)

c) Describe the mechanism through which I-Methylcyclopropene (I-MCP) acts to reduce postharvest losses of perishable commodities (8 Marks)

QUESTION FOUR (20 MARKS)

In a research project a group of 2nd year students taking BSc. Food Science & Technology in the department of Food Science, Meru University of science and Technology were conducting an experiment on postharvest physiology using oranges and bananas. Both Oranges and banana were obtained from a farmer while green but physiologically mature. Bananas were separated into two (2) batches. Batch (A) was treated with a compound X and batch (B) was stored without any treatment. Then both banana batches and the oranges were stored in a room with passion fruit that were ripening. Three days later, they realized that batch (B) of bananas had turned yellow and oranges were turning orange in color. Surprisingly batch (A) of the bananas remained green for over a week.

a) Distinguish between oranges and bananas ripening behavior (6 Marks)

b) Discuss the dramatic turning in oranges and bananas batch (B) and what may have led to the changes observed (4 Marks)

c) Describe what compound X was and how it works to inhibit ripening (4 Marks)

d) Describe any three (3) postharvest management practices that could have been used to avert dramatic changes and subsequent short storage life of batch (B) of bananas (6 Marks)