

# MASENO UNIVERSITY UNIVERSITY EXAMINATIONS 2016/2017

FOURTH YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN HORTICULTURE AND AGRONOMY WITH INFORMATION TECHNOLOGY

## MAIN CAMPUS

AAG 407: POSTHARVEST PHYSIOLOGY AND TECHNOLOGY

Date: 27th July, 2017

Time: 12.00 - 3.00pm

## INSTRUCTIONS:

· Answer ALL Questions in sections A and any other THREE in section

В.

## AAG 407: POSTHARVEST PHYSIOLOGY AND TECHNOLOGY

## Instructions:

- ➤ The paper has two sections (A&B)
- Attempt ALL questions in section A and any three (3) in section B

## Section A (40 marks)

#### Q1.

- a). Distinguish between the following terms as used in postharvest technology;
  - i). Field heat and vital heat. (2 marks)
  - ii). Chilling and freezing injuries. (2 marks)
  - iii). Enzymatic browning and non-enzymatic browning. (2 marks)
  - iv). Intrinsic and extrinsic parameters of food products. (2 marks)
  - v). Ripening and senescence of fruits. . (2 marks)
- b) Why
  - Are pears and apple fruits best suited to low humidity storage to check postharvest pathology? (2 marks)
  - Is time of harvesting fresh produce critical to their postharvest physiology? (2 marks)
  - Sodium bicarbonate is not commercially used to process/cook green vegetables despite its ability to enhance their retention of the green colour? (2 marks)
    - Is pre-harvest calcium nutrition of fresh produce important to their postharvest pathology? (2 marks)
    - v). Is precooling (field heat removal) critical to postharvest physiology of fresh produce? (2 marks)

#### . Q2.

Ethylene is a major plant hormone regulating postharvest life of fresh horticultural produce. Highlight:

- a) The biosynthetic pathway of ethylene. (3 marks)
- b) Any three (3) methods of commercially applying ethylene to fresh produce. (3 marks)

c) With appropriate example, the beneficial and detrimental effects of colour changes from green to yellow promoted by ethylene.

(4 marks)

Q3.

a).

(i) Define water activity (a<sub>w</sub>)

(2 marks)

(ii) Calculate the a<sub>w</sub> of a produce held at a relative humidity of 82%.(2 marks)

b).

- Other than surface area, outline two other factors affecting the rate of dehydration during food preservation by dehydration (2 marks)
- (ii) What is the significance of surface area of produce to the process of food dehydration? (4 marks)

# Section B (30 marks)

> Attemptany three (3) questions from this section

## Q4.

- a) Distinguish between controlled atmosphere (CA) and modified atmosphere (MA).
   (2 marks)
- b) Discuss the benefits to postharvest physiology of fresh produce accruable from the use of controlled/modified atmosphere. (8 marks)

#### O5.

- a) Distinguish between natural acidification and combined acidification as methods of food preservation. (2 marks)
- b) Using the example of pickles discuss food preservation using natural acidification. (8 marks)

#### O6.

One important feature of fresh produce is their being alive and typical of all living plant tissues, they therefore respire. What is the significance of respiration to their postharvest life? (10 marks)

## Q7.

Temperature is the single most important factor affecting the postharvest life of fresh horticultural produce. Indeed all other management measures are considered supplementary to the maintenance of 'a cold chain' from the packhouse to the consumer. Explain. (10 marks)