



EMBU UNIVERSITY COLLEGE

(A Constituent College of the University of Nairobi)

2015/2016 ACADEMIC YEAR

SECOND SEMESTER EXAMINATION

**FOURTH YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE (AGRICULTURE) AND BACHELOR OF SCIENCE (HORTICULTURE)**

ACS 404: POSTHARVEST PHYSIOLOGY AND TECHNOLOGY

DATE: APRIL 14, 2016

TIME: 02:00-04:00

INSTRUCTIONS:

Answer Question ONE and ANY Other TWO Questions

QUESTION ONE

- a) List three methods of milk preservation. (3 Marks)
 - b) Ten kilograms of a product initially at a moisture content of 50% is dried to 13% (wet basis). How much water is removed from the product? (3 Marks)
 - c) Explain the meaning of the term "acquired property". (3 Marks)
 - d) Define both physiological maturity and horticultural maturity. (3 Marks)
 - e) Describe one biological preservation method. (3 Marks)
 - f) Explain the meaning of the term "decimal reduction time" as used in thermal processing. (3 Marks)
 - g) Explain the difference between bulk and specific density of shelled maize. (3 Marks)
 - h) Define GAP and state its relevance in postharvest operations. (3 Marks)
 - i) Explain the importance of waxing in postharvest operations. * (3 Marks)
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- j) Why are thermal methods of preservation becoming less popular?

(3 Marks)

QUESTION TWO

The properties of a biological product can be classified into two broad categories in terms of our perception.

- a) Define the terms intrinsic and acquired qualities. (5 Marks)
- b) List at least five intrinsic and five acquired qualities. (5 Marks)
- c) Discuss the importance of two intrinsic properties in the determination of product quality. (5 Marks)
- d) Discuss the existence of abnormal moisture in storage and its consequence. (5 Marks)

(5 Marks)

QUESTION THREE

- a) Discuss four major differences between perishable and non perishable agricultural products. (8 Marks)
- b) Discuss the ripening of fruits with respect to the following stages and/or characteristics;
- i) Harvesting and maturity (3 Marks)
 - ii) Climacteric and non climacteric fruits (3 Marks)
 - iii) Senescence (3 Marks)
 - iv) Fruit firmness (3 Marks)

QUESTION FOUR

- a) A product is being cooled from a temperature of 32°C to 8°C degrees. The temperature of the cooling medium is 2°C. If the half cooling time is 2 hours, how long will it take to reach the desired temperature? (6 Marks)
- b) Differentiate between pre-cooling and refrigeration in terms of energy requirements. (5 Marks)
- c) With the help of a drawing indicate where you would expect to find the slowest cooling point when cooling ;
- i) A tomato (2 Marks)
 - ii) A liquid such as juice in a cylindrical can (2 Marks)

d) Explain the technological importance of knowing the slowest cooling point?

(5 Marks)

QUESTION FIVE

a) Discuss the different principles of hazard analysis and critical control points (HACCP).

(14 Marks)

b) Explain how the product temperature and the degree of cleanliness changes with the stage of processing in a fresh produce processing plant.

(6 Marks)

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