



UNIVERSITY OF EMBU

2016/2017 ACADEMIC YEAR

SECOND SEMESTER EXAMINATION

FOURTH YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
AGRICULTURE/ HORTICULTURE

ACS 404: POSTHARVEST PHYSIOLOGY AND TECHNOLOGY

DATE: APRIL 10, 2017

TIME: 2:00-4:00PM

INSTRUCTIONS:

Answer Question ONE and ANY other TWO Questions

QUESTION ONE

- a) List three types of foreign matter usually found in stored grain. [3 Marks]
- b) Ten kilograms of a product initially at a moisture content of 45% is dried to 13% (wet basis). How much water is removed from the product? [3 Marks]
- c) Explain the meaning of the term “physical property” as used in food processing. [3 Marks]
- d) Define horticultural maturity using spinach as an example. [3 Marks]
- e) State and define one physical preservation method. [3 Marks]
- f) Explain the meaning of the term “half cooling time” as used in thermal processing. [3 Marks]
- g) One of the principles of hazard analysis and critical control points (HACCP) is to establish critical control limits. Explain what these limits are and how they are established. [3 Marks]
- h) Define SOP and state its relevance in postharvest operations. [3 Marks]
- i) Explain the importance of pasteurizing in processing operations. [3 Marks]
- j) Explain why thermal methods of preservation are becoming less popular. [3 Marks]

QUESTION TWO:

- a) Discuss both intrinsic and acquired qualities with respect to product size. [6 Marks]
- b) Explain how a colour chart can be used in fruit grading factory. [4 Marks]
- c) Discuss the importance of sorting products by size. [6 Marks]
- d) Discuss the importance of germination potential to the brewing industry. [4 Marks]

QUESTION THREE

- a) Discuss horticultural maturity and physiological maturity, citing at least two examples of products whose maturity can be determined in each case. [8 Marks]
- b) Discuss the ripening of fruits with respect to the following stages and/or characteristics;
 - i) Harvesting and maturity [3 Marks]
 - ii) Sugar content [3 Marks]
 - iii) Senescence [3 Marks]
 - iv) Fruit firmness [3 Marks]

QUESTION FOUR

- a) A product is being cooled from a temperature of 40°C to 12°C. The temperature of the cooling medium is 2°C. If the half cooling time is 2 hours, how long will it take for the product to reach the desired temperature of 12°C [6 Marks]
- b) Based on the final temperature in Q3 (a) discuss the nature and type of the product. [4 Marks]
- c) A spherical object is being heated (baked) by a surrounding fluid. Use a diagram to indicate the position that governs the success of the baking processing and then explain why this point is so important. [6 Marks]
- d) Use an equation to discuss the factors that contribute to the rate of baking. [4 Marks]

QUESTION FIVE

- a) Discuss the good agricultural practices (GAP) and their effect on postharvest quality. [4 Marks]
- b) With the aid of a diagram explain how the oxygen and carbon dioxide levels change during prolonged modified atmosphere packaging (MAP) storage, including gas levels that should not be exceeded. [10 Marks]
- c) Discuss three principles of hazard analysis and critical control points (HACCP). [6 Marks]

END