



**UNIVERSITY OF
SWAZILAND**

FACULTY OF HEALTH SCIENCES

B.Sc. ENVIRONMENTAL HEALTH SCIENCE

END OF SEMESTER I EXAMINATIONS

TITLE OF PAPER: FOOD PROCESSING

COURSE CODE: EHS507

DURATION: 2 HOURS

DATE: DECEMBER 2013

INSTRUCTIONS:

1. READ THE QUESTIONS CAREFULLY
2. ANSWER **ANY 4 QUESTIONS**
3. EACH QUESTION CARRIES 25 MARKS. WHERE A QUESTION IS SUBDIVIDED INTO PARTS, THE MARK FOR EACH PART IS SHOWN IN BRACKETS.
4. NO PAPER SHOULD BE BROUGHT INTO THE EXAMINATION ROOM
5. BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER

SPECIAL REQUIREMENTS: CALCULATOR

DO NOT OPEN THE QUESTION PAPER UNTIL INSTRUCTED TO DO SO BY THE INVIGILATOR.

QUESTION 1

- a. Distinguish between steady state and unsteady state heat transfer. [5]
- b. Discuss the benefits of UHT processes compared to low temperature long time processing with respect to microbial and nutritional quality. Use a diagram to illustrate your answer. [10]
- c. Discuss the process and benefits of blanching in food processing. [10]

[25]

QUESTION 2

- a. Use a diagram to illustrate the movement of moisture during drying of food. [10]
- b. Discuss the mechanism of drying food under the following headings:
 - i. Constant rate period. [5]
 - ii. Falling rate period. [10]

[25]

QUESTION 3

- a. Write notes on the following:
 - i. Heat film coefficient. [6]
 - ii. Irradiation dose. [4]
 - iii. Radappertisation. [5]
 - iv. Radurisation. [5]
- b. Calculate the temperature rise that is caused by irradiating water using a dose of 6×10^6 radiological units (rads). (Note: $1 \text{ rad} = 10^{-2} \text{ Gy}$). [5]

[25]

QUESTION 4

Discuss the concept of commercial sterility, with special consideration of the following:

- i. Total heating effect (F_0). [10]
- ii. The Botulinum cook. [5]
- iii. The z-value. [5]
- iv. Acid and low acid foods. [5]

[25]

QUESTION 5

- a. Compare and contrast cold air freezing with immersion freezing. [10]
- b. Use a diagram to show the changes that take place during the freezing and thawing of food and explain how they affect the rate of heat transfer. [15]

[25]

THE END