



**UNIVERSITY OF  
SWAZILAND**

**FACULTY OF HEALTH SCIENCES**

**B.Sc. ENVIRONMENTAL HEALTH SCIENCE**

**FINAL EXAMINATIONS**

**TITLE OF PAPER:** DAIRY SCIENCE  
**COURSE CODE:** EHS506  
**DURATION:** 2 HOURS  
**DATE:** MAY 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: NONE**

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

### QUESTION 1

- a. Why is it possible to use alkaline phosphatase to monitor the effectiveness of pasteurization? [4]
  - b. Describe the objectives of heat treatment of milk. [6]
  - c. Discuss the physical and chemical changes that occur in milk during heat treatment. [15]
- [25]

### QUESTION 2

Discuss the principles and purpose of the following tests done at the dairy:

- a. Acidity test. [5]
  - b. Resazurin test. [5]
  - c. Aerobic mesophilic count. [5]
  - d. Freezing point determination. [5]
  - e. Clot-on-boiling. [5]
- [25]

### QUESTION 3

- a. Describe the effect of lactose crystallisation on the quality of milk products. [5]
  - b. Discuss the role of  $\kappa$ -casein on the stability of the casein micelle. [10]
  - c. Discuss the role of rennet/chymosin during cheese making. [10]
- [25]

### QUESTION 4

- a. Discuss the effects of homogenization on the quality of milk. [10]
  - b. Describe the function of the following ingredients in ice-cream:
    - i. Sugar. [2]
    - ii. Emulsifier. [3]
    - iii. Fat. [2]
    - iv. Milk solids not fat. [3]
  - c. Outline the difference between UHT milk and extended shelf life milk products. [5]
- [25]

### QUESTION 5

- a. Using a labeled diagram, describe the process of spray drying milk. [10]
  - b. Outline 3 other methods that can be used to dry milk. [15]
- [25]

**END OF EXAMINATION**