



**UNIVERSITY OF  
SWAZILAND**

**FACULTY OF HEALTH SCIENCES**

**B.Sc. ENVIRONMENTAL HEALTH SCIENCE**

**SUPPLEMENTARY EXAMINATIONS**

**TITLE OF PAPER:** DAIRY SCIENCE  
**COURSE CODE:** EHS506  
**DURATION:** 2 HOURS  
**DATE:** JUNE/JULY 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

Describe the effect of the following on the casein micelle:

- a. Low temperature. [5]
- b. Heat. [5]
- c. Acid. [5]
- d. Ethanol. [5]

Explain the behaviour of casein proteins and globular proteins during acidification. [5]

[25]

### QUESTION 2

- a. List the possible causes of variation in milk composition. [5]
- b. State the factors that influence the natural creaming of milk. [8]
- c. Discuss the quality problems that may be encountered with evaporated milk? [12]

[25]

### QUESTION 3

- a. Briefly explain the role of lactic acid bacteria in cheese making. [5]
- b. Define a bacteriophage and explain why it is undesirable in milk? [10]
- c. Describe the two ways through which bacteriophages replicate themselves in the milk. [10]

[25]

### QUESTION 4

- a. Draw a flow diagram showing all the key steps in the manufacture of hardened ice-cream. [15]
- b. Explain the following terms in relation to ice cream:
  - i. Overrun. [3]
  - ii. Foam stability. [3]
- c. What is the role of the following ingredients in the ice cream mixture?
  - i. Fat. [2]
  - ii. Emulsifier. [2]

[25]

### QUESTION 5

- a. Use a flow diagram to illustrate the manufacture of stirred-type yogurt. [7]
- b. Explain the effect of the following on the quality of the yogurt described above:

- i. Homogenization. [5]
- ii. Type of starter culture. [5]
- c. State the important requirements for good quality butter. [8]

[25]

**END OF EXAMINATION**