



**UNIVERSITY OF
SWAZILAND**

FACULTY OF HEALTH SCIENCES

B.Sc. ENVIRONMENTAL HEALTH SCIENCE

END OF SEMESTER I EXAMINATIONS

TITLE OF PAPER: FOOD MICROBIOLOGY I

COURSE CODE: EHS503

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: NONE

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

QUESTION 1

- What should be included in a microbiological specification for food? [10]
- Using examples, explain the difference between 2-class and 3-class attribute sampling plans. [10]
- The table below shows sampling plans for three microorganisms in frozen shrimp.

Test	n	c	m	M
Mesophilic aerobic bacteria	5	2	10^5	10^6
<i>Staphylococcus aureus</i>	5	2	5×10^2	5×10^3
<i>Salmonella</i> sp.	5	0	0	-

Explain the rationale for choosing the stated sampling plan for each microorganism. [5]

[25]

QUESTION 2

- Explain how the dye reduction technique is used to detect the state of microbial quality in food. [10]
- Discuss the principles of the Gram stain, explaining the basis for the different reactions in different microorganisms. [15]

[25]

QUESTION 3

- Discuss the similarities and differences between antibiotics and bacteriocins. [8]
- Name the source of nisin used in food preservation and its scope and mode of action. [7]
- Describe the criteria used for selecting probiotic microorganisms used in food. [10]

[25]

QUESTION 4

- a. Name the type and describe effects of food poisoning microorganisms most likely present in the following foodstuffs:
- i. Canned foods. [5]
 - ii. Beef stew. [5]
 - iii. Fermented sausage. [5]
- b. Discuss the benefits of curing ham with regards to the microbial safety of the product. [10]

[25]

QUESTION 5

- a. *Salmonella enteritidis* and *Salmonella typhi* cause diagnostically different types of food poisoning. Describe the symptoms and highlight the differences between the two. [10]
- b. *Escherichia coli* O104:H4 is a pathogenic strain of *E. coli*. Discuss the etiology of food poisoning due to this strain and the complications that may be encountered. [15]

[25]

THE END