UNIVERSITY OF ESWATINI

FACULTY OF HEALTH SCIENCES

B.Sc. ENVIRONMENTAL HEALTH AND FOOD SCIENCE

B.Sc. ENVIRONMENTAL HEALTH SCIENCE

SEMESTER I

RE-SIT EXAM

JANUARY 2019

TITLE OF PAPER: FOOD MICROBIOLOGY

COURSE CODE: EHS323

DURATION: 2 HOURS

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. WRITE NEATLY AND CLEARLY
6. BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER.

SPECIAL REQUIREMENTS: NONE

DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR.

QUESTION 1

a. Discuss the evolution of lactic acid bacteria as probiotics. [10]

b. Discuss the concerns associated with antibiotics in the food chain. [15]

[Total: 25 marks]

QUESTION 2

a. The Table below presents recommended sampling plans for poultry products. With reference to the table, answer the following questions.

i. Distinguish between 2-class and 3-class attribute sampling plans. [4 marks]

ii. Explain why the 2-class and 3-class plans are recommended for *Salmonella* and *Staph. auereus*, respectively. [6 marks]

iii. In the case of cooked poultry meat, frozen, ready to eat, the value for n=10. Explain why this is different from that of cooked poultry meat, frozen, to be re-heated before eating. [4 marks]

iv. As expected of a microbiological specification, what other parameter could be added to this table? [2 marks]

Sampling plans and recommended microbiological limits for poultry and poultry products

Product	**Test**	**Plan class**	**n**	**c**	**m**	**M**
Cooked poultry meat, frozen; to be reheated before eating (e.g., prepared frozen meals)	*Staph. aureus* *Salmonella*	3 2	5 5	1 0	10^3 0	10^4
Cooked poultry meat, frozen, ready-to-eat (e.g., turkey rolls)	*Staph. aureus* *Salmonella*	3 2	5 10	1 0	10^3 0	10^4
Dehydrated poultry products	*Salmonella*	2	10	0	0	

b. Discuss the benefits of microbiological specifications to food safety. [4 marks]

c. Distinguish between 'consumer's risk' and 'producer's risk'. [5 marks]

[Total: 25 marks]

QUESTION 3

a. Describe how microbial films in food processing equipment form. [12]
b. Why are these films of concern in the food industry? [3]
c. Briefly outline a method of checking the effectiveness of cleaning food contact surfaces. [10 marks]

[Total: 25 marks]

QUESTION 4

a. Discuss the type of food poisoning caused by the following pathogenic microorganisms, highlighting the infective dose, symptoms, and severity of the illness:
    i. *Clostridium botulinum.* [5]
    ii. *Escherichia coli* O157:H7. [5]
    iii. *Listeria monocytogenes.* [5 marks]
b. Describe the mode of disease causing action by the following pathogens:
    i. *Salmonella enteritidis.* [5 marks]
    ii. *E. coli* O104:H4. [5 marks]

[Total: 25 marks]

QUESTION 5

a. Bacteria exist in many shapes and sizes. Name three different shapes of bacterial cells. [3 marks]
b. Difference in staining using the Gram stain shows differences in the cell wall structure of bacteria. Explain these differences and how they are used in characterising bacteria. [10 marks]
c. Discuss the criteria that must be satisfied for a microorganism to be selected as an indicator microorganism. [12 marks]

[Total: 25 marks]

END OF EXAMINATION PAPER