

# NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

BACHELOR OF SCIENCE HONOURS DEGREE EXAMINATIONS

DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY

## **THEORY: FOOD MICROBIOLOGY SBB2206**

JUNE 2004

2 ½ HOURS (100 marks)

### **INSTRUCTIONS**

Answer FOUR (4) Questions. Each question carries 25 marks. Where a question contains subdivisions, the mark value for each subdivision is given in brackets. Illustrate your answer where appropriate with large, clearly labelled diagrams.

1. Give a detailed account of the primary sources of microorganisms in foods, and outline briefly the methods employed in minimizing contamination from each source.
  
2. Although the objective of canning is to achieve commercial sterility and to prevent post-process contamination of thermally processed foods, products nevertheless undergo microbial spoilage under certain conditions. Describe;
  - (i) the types of microbial spoilage encountered in canned foods. (14 marks)
  - (ii) the characteristics and clinical features of ONE organism implicated in food poisoning incidents associated with canned foods. (11 marks)
  
3.
  - (a) Name and describe briefly, two microbial groups used as indicators of food sanitary quality. (5 marks)
  - (b) Discuss the merits and demerits of using the named microbial groups as indicator organisms. (5 marks)
  - (c) Name one suitable medium which could be used for enumerating each of the two indicator groups, and explain the crucial features of each medium. (5 marks)
  
  - (d) What is the significance of the following set of results?

(i)	Ice-cream	<i>Escherichia coli</i>	1000/g
(ii)	Beef curry	<i>Clostridium perfringens</i>	2460/g
(iii)	Pasteurised milk	Total plate counts	$3 \times 10^5$ /mL
(iv)	Raw chicken	<i>Salmonella</i>	present in 25g sample
(v)	Yoghurt	Total plate count	$1 \times 10^8$ /g

(2 marks each)
  
4. Describe the following species and their mechanisms of pathogenicity, emphasizing those aspects which are relevant to food processing.
  - (i) *Salmonella typhi* (9 marks)
  - (ii) *Bacillus cereus* (8 marks)
  - (iii) *Vibrio cholerae* (8 marks)
  
5.
  - (a) Give an account of the spoilage patterns commonly observed in the following foods.
    - (i) Butter
    - (ii) Vacuum packed beef
    - (iii) Fruit beverages
    - (iv) Vegetables (4 marks each)

---

5.(b) Write short notes on any three mycotoxins, stating the producing organism, their occurrence and significance to consumers. (9 marks)

6. Write briefly on the role of the following agents in controlling microbial populations in foods;

- (i) chemical preservatives (13 marks)
- (ii) irradiation (7 marks)
- (iii) chilled storage (5 marks)

**END OF EXAMINATION**

odd no's