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|--------------|-----------------------------------------------|-------|-----|
| FACULTY      | AGRICULTURE, ENGINEERING AND NATURAL SCIENCES |       |     |
| DEPARTMENT   | FOOD SCIENCE AND SYSTEMS                      |       |     |
| SUBJECT      | FOOD MICROBIOLOGY                             |       |     |
| SUBJECT CODE | AFST 3791                                     |       |     |
| DATE         | JUNE 2017                                     |       |     |
| DURATION     | 3 HOURS                                       | MARKS | 100 |

### **SECOND OPPORTUNITY EXAMINATION**

**Examiner: Dr MNNN Shikongo-Nambabi**

**Moderator: Dr. P. Hiwilepo-van Hal**

This question paper consists of three (3) pages including this front page.

*Instructions:*

Answer all five (5) questions

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### QUESTION 1

- a) Discuss the molecular events that occur during the lag phase when bacteria or filamentous fungi are cultured in a static system. [6]
- b) Discuss the exponential growth phase of microorganisms in a static culture system. [6]
- c) Define the term 'Doubling time' as applied to microbial growth and outline its significance to Industrial microbiology. [8]

### QUESTION 2

- a) Outline the application of the following methods to food analysis
  - i) PCR (Polymerase Chain Reaction) cycle steps [8]
  - ii) Direct Epifluorescence filter technique (DEFT) [4]
- b) Discuss the Oxidative Fermentative (OF) test. [8]

### QUESTION 3

- a) Outline the Pour plate and Spread plate techniques of microbial counts. [6]
- b) Discuss the rationale behind serial dilutions of food samples before performing microbial counts. [4]
- c) Briefly discuss how the following factors affect growth and survival of microorganisms in foods.
  - i) pH and Buffering capacity [5]
  - ii) Antimicrobial barriers and constituents [5]

### QUESTION 4

- a) Differentiate between Infectious and Toxigenic food borne diseases. [8]
- b) Discuss how you would isolate *Salmonella spp.* from a piece of meat up to the stage of the first biochemical test on TSI and its results. [8]

- c) Outline the pathogenic mechanisms of *Clostridium botulinum* neurotoxins. [4]

### QUESTION 5

- a) Outline three (3) effects of bacterial metabolism of the following food components:
- i) Monosaccharides [3]
  - ii) Proteins [6]
- b) Outline three (3) consequences/implications of the presence of microorganisms in food. [3]
- c) In a two class attribute sampling plan, samples are classified as either acceptable or defective.

Define the following symbols used in this scheme:

- i)  $n$  [2]
- ii)  $m$  [3]
- iii)  $c$  [3]

END OF EXAMINATION