



FACULTY	AGRICULTURE, ENGINEERING AND NATURAL SCIENCES		
DEPARTMENT	FOOD SCIENCE AND SYSTEMS		
SUBJECT	FOOD MICROBIOLOGY		
SUBJECT CODE	AFST 3791		
DATE	JUNE 2024		
DURATION	3 HOURS	MARKS	100

REGULAR 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) Outline three reasons for microbiological examination/analysis in foods. [3]
- b) Define the term Indicator Organisms and mention five (5) factors that make such organisms suitable candidates as indices of sanitation in food. [6]
- c) Outline three (3) reasons for the use of indicator organisms. [6]
- d) Define the term *Coliforms* and give three (3) examples of bacterial genera or species that belong to this group. [5]

QUESTION 2

- a) Discuss how the following factors are manipulated to prolong the shelf life and optimise safety of meat:
 - i) Temperature [5]
 - ii) Surrounding atmosphere [5]
- b) Using specific examples for each discuss the following types of media in microbial examination of food.
 - i) Selective differential media [5]
 - ii) Selective enrichment broth [5]

QUESTION 3

- a) Describe the Gram reaction, shape and habitat of the following bacterial agents of food borne diseases:
 - i) Enterohaemorrhagic *E. coli* [6]
 - ii) *Clostridium botulinum* [6]
- b) Discuss the relevance of personal hygiene of food handlers to food safety. [8]

QUESTION 4

Discuss the significance and procedures of the following tests in Food Microbiology.

- a) 4-methyl umbellyferyl β - D glucuronide (MUG) [5]
- b) Motility test [5]
- c) Indole test [5]
- d) Methyl Red test [5]

QUESTION 5

a) Define the following terms and give the equations of how they are calculated in food microbiology defining each variable in the equation.

i) Doubling time [4]

ii) The D value [8]

b) Outline the mathematical expression that describes the death of microorganisms when exposed to a heat process and define each parameter in the equation. [8]

END OF EXAMINATION