

**QUESTION PAPER**

THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

SECOND SEMESTER EXAMINATION

CH423 - FOOD CHEMISTRY AND ANALYSIS

MONDAY 31<sup>ST</sup> OCTOBER 2022 8:20 AM

**TIME ALLOWED: 2 HOURS**

**INFORMATION FOR CANDIDATES:**

1. You will have 10 minutes to read the question paper. You **MUST NOT** begin writing in the answer book during this time.
2. **ANSWER ALL QUESTIONS.**
3. All answers **MUST** be written on the answer book provided
4. Calculators are permitted in the examination room. Lecture notes, notebooks plain papers and textbooks are **NOT** allowed.
5. Mobile phones are not allowed. **SWITCH OFF THE MOBILE PHONES.**
6. Show all workings and calculations in the answer book.
7. **DRAW the STRUCTURES** clear and visible.
8. **DO NOT** overwrite.
9. Write your name and number clearly on the front page. **DO IT NOW.**

**MARKING SCHEME:** Total 50 marks

1. (a) Name TWO sources each for Pyridoxine (vitamin B<sub>6</sub>) and Thiamin (Vitamin B<sub>1</sub>).
- (b) What are incidental additives? Give ONE example.
- (c) Give TWO reasons how benzoic acid can acts as an effective food preservative against microorganisms.
- (d) Define the term 'new product' with respect to food product development.
- (e) Give any TWO uses of alginates.

(10 marks)

2. (a) What are synthetic food colourants and nature-identical food colourants?
- (b) Distinguish between restoration and fortification in food processing.
- (c) Explain briefly the  $\beta$ -sheet secondary structure of a protein.
- (d) Suggest any FOUR reasons why 'new product development' is taking place?
- (e) Give any FOUR differences between globular and fibrous proteins.

(20 marks)

3. (a) Define the following with ONE example each:

- (i) Firming agents.  
(ii) Humectants.  
(iii) Anticaking agents.

[6 marks]

- (b) (i) What are food additives?

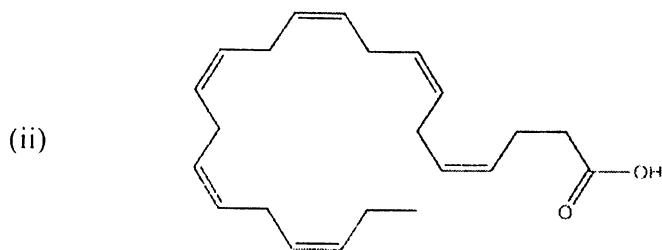
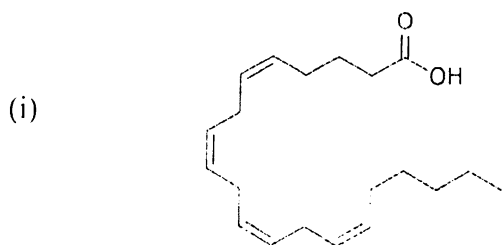
[2 marks]

- (ii) Give TWO primary causes for food spoilage.

[2 marks]

(Total = 10 marks)

4. (a) Starting from the degree of ionization of water at equilibrium and using equilibrium constant ( $K_{eq}$ ), show that the ionic product of water is equal to  $1.0 \times 10^{-14} \text{ M}^2$ . Calculate the pH of  $7 \times 10^{-5} \text{ M}$  NaOH solution.
- (b) The structures of fatty acids are given below. Give the symbolic expression in both  $\Delta$  and  $\omega$ .



(10 marks)