THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

SECOND SEMESTER EXAMINATION

CH 372 – FOOD CHEMISTRY AND ANALYSIS

TUESDAY 27th OCTOBER 2020 12:50 PM

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** over write.

9. Write your name and number clearly on the front page. **DO IT NOW.**

MARKING SCHEME: Total 60 marks

1.   (a)   Define the following, with ONE example each:
                (i) Anticaking agents
                (ii) Humectants

[4 marks]

    (b)   Phospholipids can be classified into two classes. What are they?

[2 marks]

    (c)   Give any FOUR differences between globular and fibrous proteins.

[4 marks]

(Total = 10 marks)

2.   (a)   Name any TWO sources of Niacin (Vitamin B_3).

[2 marks]

    (b)   What are triacylglycerols? Give THREE major functions of triacylglycerols in food materials.

[4 marks]

    (c)   What are carrageenans? Suggest ONE of its properties and name ONE use of kappa (k)- carrageenan.

[4 marks]

(Total = 10 marks)

3.   (a)   Distinguish between restoration and fortification in food processing.

    (b)   Explain briefly the β-sheet secondary structure of a protein molecule..

    (c)   What are synthetic colourants and nature-identical food colourants?

    (d)   (i) 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 $1.0 \times 10^{-14} M^2$.
                (ii) Calculate the pH of 7×10^{-5} M NaOH solution.

(20 marks)

4.   (a)   Explain mutarotation in sugars taking D-glucose as an example.

[3 marks]

(b) The structures of fatty acids are given below. Give the symbolic expression in both Δ and ω.

(i)

(ii)
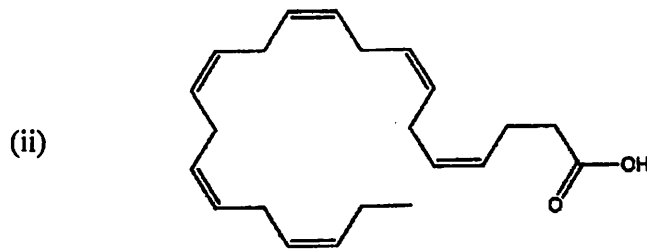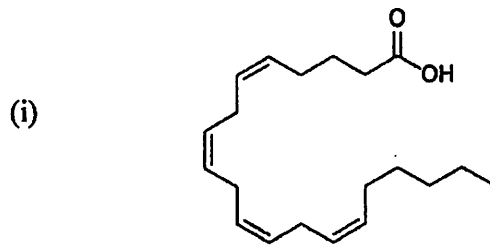
[4 marks]

(c) What are homo- and hetero-polysaccharides?

[3 marks]

(Total = 10 marks)

5. (a) Distinguish between epimers and anomers.

(b) What are food additives? Give any ONE primary cause for food spoilage.

(c) Name any TWO fat soluble vitamins.

(d) Give TWO ways by which you can overcome 'lactose intolerance' deficiency.

(10 marks)