THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

FIRST SEMESTER EXAMINATIONS – 2020

FOOD TECHNOLOGY – SECOND YEAR DEGREE

FT 216 NUTRITION I

FRIDAY 19TH JUNE, 2020 – 12:50 PM

TIME ALLOWED: 3 HOURS

INFORMATION FOR CANDIDATES:

1. You have 10 minutes to read the paper. You must not begin writing in the answer book during this time.

2. **ANSWER ALL QUESTIONS.**

3. All answers must be written in the answer books provided.

4. Write your name and number clearly on the front page. Do it now.

5. Calculators are permitted in the examination room. Notes and textbooks are not allowed.

6. Show all workings and calculations in the answer book.

MARKING SCHEME

SECTION A
Question 1   [28 marks]
Question 2   [18 marks]
Question 3   [24 marks]

SECTION B
Question 4   [13 marks]
Question 5   [9 marks]
Question 6   [8 marks]

SECTION A

ANSWER ALL QUESTIONS

1. (a)   Select ANY ONE of the following and describe: [3 marks]

    (i)   Insulin and energy storage.
    (ii)   Glucagon and mobilization of stored energy.

    (b)   Select ANY ONE of the following and describe: [3 marks]

    (i)   Phospholipids and their importance.
    (ii)   Sterols and their importance.

    (c)   What would happen to the body of a growing child
          when essential amino acids are missing in their diet?   [2 marks]

    (d)   State and describe an important function of water in
          the body.   [2 marks]

    (e)   What are electrolytes and how do they regulate fluid
          balance?   [3 marks]

    (f)   Select ANY ONE of the following and describe: [3 marks]

    (i)   Glucose and its nutritional importance.
    (ii)   Physical properties of dietary fibre.
    (iii) Essential fatty acids and their importance.

    (g)   Write short notes on the following:

    (i)   ANY ONE named water-soluble vitamin.   [3 marks]
    (ii)   ANY ONE named fat-soluble vitamin.   [3 marks]
    (iii) ANY ONE named major mineral.   [3 marks]
    (iv)   ANY ONE named trace mineral.   [3 marks]

                                   (Total = 28 marks)

2. (a)   Describe the digestion, absorption and transportation
          of lipids in the body.   [4 marks]

    (b)   Describe what a functional fibre is, giving an example.   [2 marks]

(c)   When Ambai goes food shopping, she watches the glycemic index and the glycemic load of the foods she buys. Why do you think she does that?   [2 marks]

(d)   Fully state ANY TWO functions of proteins.   [2 marks]

(e)   Select ANY ONE of the following and explain: [2 marks]

    (i)   Heart burn.
    (ii)   Stomach ulcer.

(f)   With your understanding of the important functions of protein in the body. Explain the cause of oedema in a child suffering from protein-energy malnutrition.   [2 marks]

(g)   Explain the importance and significance of the following mandatory fortifications in PNG; fortification of rice with iron and iodization of salt with iodine. Include in your answer, an explanation of the choice of nutrients as well as the food products.   [4 marks]

(Total = 18 marks)

3.   (a)   What are the purposes for which the body uses energy? State them fully.   [3 marks]

(b)   Name and describe ANY TWO factors that affect basal metabolic rate.   [3 marks]

(c)   Choose ONLY ONE of the following anabolic pathways and describe: [2 marks]

    (i)   Lipogenesis.
    (ii)   Gluconeogenesis.

(d)   Describe ketogenesis and its importance during fasting period.   [3 marks]

(e)   Describe Cori cycle?   [2 marks]

(f)   We call carbohydrates, proteins and lipids as energy yielding nutrients but we also understand that cells are unable to use nutrients directly for energy. So how do these nutrients give us the energy we need to sustain our lives? Choose either glucose, amino acids or fatty acids and describe how their catabolism give the usable energy to sustain cellular functions.   [4 marks]

(g)   Adenosine triphosphate or ATP, nicotinamide adenine dinucleotide (NAD) and flavin adenine dinucleotide (FAD) are key energy players in metabolic reactions. Explain what they are and their importance in these reactions.   [4 marks]

(h)   Select ANY ONE of the following and describe its influence on energy metabolism: [3 marks]

        (i)   Post-absorptive state – 3-4 hours after intake.
        (ii)   Fasting state – first 5 days commencing 24 hours after last meal
        (iii)   Prolonged fasting.

                                        (Total = 24 marks)

SECTION B

ANSWER ALL QUESTIONS

4. (a) Describe what atherosclerosis is and list at least THREE
         ways in which it can be controlled.   [2 marks]

    (b) What would be the outcomes of a person who obtains
         optimum nutrients and of a person who obtains fewer
         nutrients? List THREE outcomes for each person.   [3 marks]

    (c) Differentiate between food allergy and food intolerance   [4 marks]

    (d) Name the antibody that is involved in allergic reaction.   [1 mark]

    (e) Discuss ANY ONE of the causes of cancer that is
         food- related and give at least TWO examples of certain
         foods that can prevent it.   [3 marks]

                              (Total = 13 marks)

5. (a) The 'imputed value' is one of those values used in a
         Food Composition Table. List the THREE WAYS in
         which the 'imputed values' can be obtained.   [3 marks]

    (b) Give two examples of the use of food composition data
         table at the national level.   [2 marks]

    (c) Walter is a healthy adult and he plans to live a healthy
         lifestyle by eating the right amount and type of food.
         What would be his balance diet composed of?   [3 marks]

    (d) What are TWO WAYS in which foods are classified?   [1 mark]

                              (Total = 9 marks)

6. (a) Discuss ANY TWO of the following;   [4 marks]

         (i)   Adequate intake (AI).
         (ii)   Recommended Daily allowance (RDA).
         (iii) Tolerable Upper intake levels (UI).
         (iv)   Estimated Average Requirement (EAR).

(b)   Refer to the Nutrition information panel below.
The Daily value percentage is based on 2000 calories.
How would you explain the Daily Value percentage of
the following: [4 marks]

(i)   Vitamins and minerals.
(ii)   Unsaturated fats and total carbohydrates.

Nutritional facts	
Serving size Servings per container	2/3 cups (55g) 8
Amount per serving	
Calories 110	Calories from fat 65
	% Daily Value
Total fat 8g	12%
Saturated fat 1g	5%
Trans fat 0g	0%
Cholesterol 0g	0%
Sodium 160mg	7%
Total Carbohydrates 37g	12%
Dietary fiber 4g	16%
Sugars 1g	
Protein 1g	
Vitamin A 10%	Vitamin C 8%
Calcium 20%	Iron 45%

(Total = 8 marks)