

THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

SECOND SEMESTER EXAMINATIONS – 2021

FOOD TECHNOLOGY - FOURTH YEAR DEGREE

FT 452 TROPICAL AGRICULTURE COMMODITIES

MONDAY 25<sup>TH</sup> OCTOBER, 2021– 12:50 P.M.

**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**

|            |              |
|------------|--------------|
| QUESTION 1 | [12 ½ MARKS] |
| QUESTION 2 | [12 MARKS]   |
| QUESTION 3 | [10 ½ MARKS] |
| QUESTION 4 | [10 ½ MARKS] |
| QUESTION 5 | [14 ½ MARKS] |
| QUESTION 6 | [13 ½ MARKS] |
| QUESTION 7 | [11 MARKS]   |
| QUESTION 8 | [15 ½ MARKS] |

**SECTION A**

1. Cocoa processing

- a. Name and define the three main groups of cocoa. [4 ½ marks]
- b. Describe in detail the fermentation process of cocoa. [4 marks]
- c. How is cocoa butter produced? [4 marks]

(Total = 12 ½ marks)

2. Vanilla and Coconut processing

- a. State why synthetic vanillin is preferred over natural vanillin. [2 marks]
- b. There are two standard methods of curing vanilla, the Mexican and Madagascan method. Describe in detail ANY ONE of the two in line with the four steps involved in curing of vanilla beans. [4 marks]
- c. Discuss the two cultivars of coconut. [3 marks]
- d. Discuss Food uses of coconut [3 marks]

(Total = 12 marks)

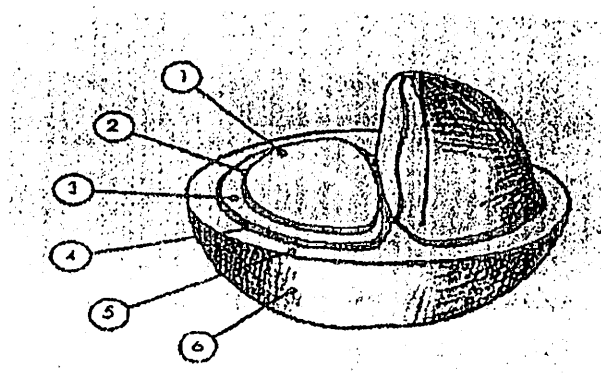
3. Palm oil processing

- a. With an aid of a diagram, describe the processing of hard palm oil. [4 marks]
- b. State the purposes for Sterilization in commercial processing of Palm oil. [2 ½ marks]
- c. Discuss Palm oil Quality [2 marks]
- d. State the chemical parameters involved in Palm oil International trading. [2 marks]

(Total = 10 ½ marks)

4. Coffee processing

- a. Label the numbered structure of the coffee bean anatomy: [3 marks]



b. There are two processes involved in removal of coffee beans during primary processing of coffee. State and describe ANY ONE of these processes involved.

[3 marks]

c. State the five different types of roast.

[2 ½ marks]

(Total = 10 ½ marks)

5. Sugar and tea processing

a. Summarize ANY TWO of the following processes:

- |                                      |           |
|--------------------------------------|-----------|
| i. Milling                           | [2 marks] |
| ii. Diffusion                        | [2 marks] |
| iii. Juice clarification             | [2 marks] |
| iv. Crystallization and centrifuging | [2 marks] |

b. Explain what Molasses and Bagasses are.

[3 marks]

c. List the THREE major classes of tea and Describe ANY ONE of them.

[3 ½ marks]

d. Describe instant tea processing.

[2 marks]

(Total = 14 ½ marks)

- b. There are two processes involved in removal of coffee beans during primary processing of coffee. State and describe ANY ONE of these processes involved. [3 marks]
- c. State the five different types of roast. [2 ½ marks]

(Total = 10 ½ marks)

5. Sugar and tea processing

- a. Summarize ANY TWO of the following processes:
- i. Milling [2 marks]
  - ii. Diffusion [2 marks]
  - iii. Juice clarification [2 marks]
  - iv. Crystallization and centrifuging [2 marks]
- b. Explain what Molasses and Bagasses are. [3 marks]
- c. List the THREE major classes of tea and Describe ANY ONE of them. [3 ½ marks]
- d. Describe instant tea processing. [2 marks]

(Total = 14 ½ marks)

**SECTION B.**

6. (a) What is the relevance of tropical food crops to you as a Papua New Guinean studying to become a Food Technologist or Food Scientist? [2 marks]
- (b) Explain the term 'food security' and give your views on the general food security situation in Papua New Guinea. [4 marks]
- (c) Most people in Papua New Guinea own land and hence have access to fresh foods throughout the year, particularly those who live in rural areas. Give ANY FOUR reasons why there is a need to process food crops including fruits and vegetables. [4 marks]
- (d) Write short notes on the main limitations or constraints faced in processing food crops such as fruits and vegetables in PNG. [3½ marks]
- (Total = 13½ marks)

7. (a) Various technologies or methods can be used to reduce deterioration of fruits and vegetables. List ANY FOUR methods which could be used. [2 marks]
- (b) Fruits and vegetables to be frozen must be stabilized against enzymatic browning during storage and upon thawing. Describe ANY THREE methods used to achieve these. [2 marks]
- (c) List and describe fruit juice processing procedures. [7 marks]

(Total = 11 marks)

8. (a) Explain ANY TWO factors that limit production of yam. [2 marks]
- (b) Name and discuss the anti-nutritive substance in taro. [3 marks]
- (c) Discuss ANY THREE value added products from banana. [6 marks]
- (d) Explain how sago starch should be stored to prevent growth of fungi. [2 marks]
- (e) Write short notes on FIVE uses or potential uses of sago starch. [2½ marks]
- (Total = 15½ marks)