

THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

SECOND SEMESTER EXAMINATIONS - 2021

FOOD TECHNOLOGY - THIRD YEAR DEGREE

FT 321 FOOD SAFETY AND HACCP

FRIDAY 05TH NOVEMBER, 2021– 08:20 A.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	[22 MARKS]
QUESTION 2	[27 MARKS]
QUESTION 3	[21 MARKS]
QUESTION 4	[14 MARKS]
QUESTION 5	[16 MARKS]
QUESTION 6	[16 MARKS]

ANSWER ALL QUESTIONS

1. (a) Define the following terms:

- (i) Food Safety. [½ mark]
- (ii) Hazard. [½ mark]
- (iii) Risk. [½ mark]
- (iv) Risk Analysis. [½ mark]

(b) Discuss ANY TWO global factors that have contributed significantly to food borne diseases and outbreaks. [4 marks]

(c) Describe THREE types of food safety hazard and give an example of each. [4 marks]

(d) Below is an excerpt from a book on sago starch poisoning in PNG.

“Sago Hymolytic Disease (SHD) is the acute intravascular hemolysis of red blood cells arising from the consumption of moldy sago. The symptoms of SHD are usually manifested 12–20 h after a meal and commonly include a rapid onset of fever with vomiting, severe diarrhea, jaundice, reddish brown urine, lethargy, and mental confusion. It has been estimated that 2 out of every 10,000 people are affected annually by SHD in PNG. Outbreaks of SHD in PNG are sporadic but are sometimes fatal if severe and untreated, with mortality rates of reported outbreaks estimated as high as 25% (Greenhill 2006) and a health concern”.

Identify the type of hazard associated with sago starch poisoning and its effects on consumers. Discuss one measure of control for this food safety hazard.

[3 marks]

(e) Name one ‘unintentionally added’ chemical hazard in the food chain and one measure of control for this hazard.

[2 marks]

(f) Paradise Foods Limited treats its popular ‘Tru Tru Wara’ product with ultraviolet radiation. Discuss whether or not the product is safe to consume.

[3 marks]

(g) Discuss ANY ONE of the following:

[4 marks]

- (i) Structure of Risk Analysis.
- (ii) Hazard Identification.
- (iii) Exposure Assessment.
- (iv) Hazard Characterization.
- (v) Risk Characterization.

(Total = 22 marks)

2. (a) (i) What is Hazard Analysis Critical Control Point (HACCP) and how was it first developed?

(ii) List SEVEN principles and FIVE pre-steps of HACCP.

[3 marks]
[6 marks]

- (b) FULLY discuss ANY ONE of the following on HACCP: [4 marks]
- (i) Principle one.
 - (ii) Principle two.
 - (iii) Principle three.
- (c) John observed that the temperature of the blast freezer used for rapid freezing of raw packed sausages was below the critical limit while on his routine monitoring and check. Advise John on the best corrective action he could take to bring the process under control. [3 marks]
- (d) Differentiate between 'validation' and 'verification' and give an example of each. [3 marks]
- (e) What is the essence of keeping records of HACCP activities? [1 mark]
- (f) Define pre-requisite programme (PRP) and state its significance to HACCP. [2 marks]
- (g) Write notes on ANY ONE of the following: [5 marks]
- (i) A named PRP.
 - (ii) Food Defence Plan.
 - (iii) Allergen Management.
 - (iv) Standard Operating Procedures (SOP).

(Total = 27 marks)

3. (a) Discuss the significance and the relationship of CXC 1-1969 to HACCP. [4 marks]
- (b) Discuss ONE of the significant changes in CXC 1-1969 Rev, 2020 on the following:
- (i) PRP. [2 marks]
 - (ii) HACCP pre-steps. [2 marks]
 - (iii) HACCP principles. [2 marks]
- (c) Food safety or quality management systems are made up of collections of written documents. Fully complete the pyramid of the document hierarchy. [5 marks]
- (d) Differentiate between the two main sections of ISO 22000:2005. [4 marks]
- (e) What is 'document control'? Discuss. [2 marks]

(Total = 21 marks)

4. (a) Define the term 'food safety audit'. [1 mark]
- (b) List FIVE stages of audit and discuss one in detail. [5 marks]

- (c) Describe ANY ONE of the following: [4 marks]
- (i) Any TWO principles of audit.
 - (ii) Any TWO personal attributes of an auditor.
- (d) Discuss the 'non-conformity assessment of Quality Manual during auditing. [4 marks]

(Total = 14 marks)

For question 5 and question 6, select ONLY ONE and answer.

5. (a) (i) Define the term 'food law' and briefly state its objectives. [2 marks]
- (ii) In relation to quality, what does legislation provide? [1 mark]
- (iii) One of the international treaty or food law governing safety of food and feed is SPS agreement. Define it. [1 mark]
- (iv) Name PNG's two main national food laws. [1 mark]
- (v) Define the term 'food' as it appears in Food Sanitation Act 1991. [1 mark]
- (b) Sketch a flow diagram to show how national food law links up to SPS agreement to ensure global food safety measures are adopted, implemented and monitored at national level. [5 marks]
- (c) Differentiate between a 'standard' and a 'technical regulation' and comment on 'mandatory standards'. [3 marks]
- (d) Conformity assessment is used to determine if the relevant requirements of the technical regulation or standard are fulfilled. Give TWO examples of conformity assessment and state its significance. [2 marks]

(Total = 16 marks)

6. (a) Write short notes on ANY ONE of the following: [4 marks]
- (i) Codex Alimentarius Commission (CAC).
 - (ii) Named private standard-setting body.
 - (iii) National Institute of Standard and Industrial Technology (NISIT).
- (b) Discuss the National Food Control System and comment on the status of PNG's Food Control System. Include in your answer the list of its five components. [8 marks]
- (c) For a named regulatory body other than NISIT, discuss its responsibilities under the PNG National Food Control System. [4 marks]

(Total = 16 marks)