

THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

SECOND SEMESTER EXAMINATIONS - 2022

FOOD TECHNOLOGY - THIRD YEAR DEGREE

FT 321 FOOD SAFETY AND HACCP

FRIDAY 04<sup>TH</sup> NOVEMBER, 2022– 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	[26 MARKS]
QUESTION 2	[23 MARKS]
QUESTION 3	[18 MARKS]
QUESTION 4	[15 MARKS]
QUESTION 5	[18 MARKS]

## ANSWER ALL QUESTIONS

1. (a) Define the following terms:
- (i) Food Safety. [½ mark]
  - (ii) Hazard. [½ mark]
  - (iii) Risk. [½ mark]
- (b) Discuss the global statistics of food-borne diseases including PNG. State in your discussion the most common disease and the category of people most affected. [5 marks]
- (c) Discuss ANY TWO global factors that have contributed significantly to Food-borne diseases and outbreaks. [3 marks]
- (d) Describe THREE types of food safety hazard and give an example of each. Include in your answer the three categories of chemical hazard. [4½ marks]
- (e) Below is an excerpt from a book on sago starch poisoning in PNG.
- “Sago Haemolytic Disease (SHD) is the acute intravascular haemolysis of red blood cells arising from the consumption of mouldy 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 diarrhoea, 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]
- (f) Microbial resistance to antibiotics is a growing food safety concern. Explain how it occurs. [5 marks]
- (g) To prevent sprouting of ware potatoes in the market, the ABC farmers subject potatoes to irradiation. Discuss this treatment in relation to food safety. [4 marks]
- (Total = 26 marks)
2. (a) Define the term ‘Risk Analysis’ and explain why it is necessary in relation to food safety? [2 marks]

- (b) Discuss ANY ONE of the following: [4 marks]
- (i) Hazard Identification.
  - (ii) Exposure Assessment.
  - (iii) Hazard Characterization.
  - (iv) Risk Characterization.
- (c) (i) What is Hazard Analysis Critical Control Point (HACCP) and how was it first developed? [4 marks]  
(ii) Discuss the 'Product/Process Description' pre-step of HACCP. [3 marks]
- (d) FULLY discuss ANY ONE of the following HACCP principles: [4 marks]
- (i) Hazard Analysis.
  - (ii) Establish Limits.
  - (iii) Establish System of Monitoring and Control of CCP.
- (e) Tom observed that the temperature of the blast freezer used for rapid freezing of raw packed prawns was above the critical limit while on his routine monitoring and check. Advise Tom on the best corrective action he could take to bring the process under control. [3 marks]
- (f) Differentiate between 'validation' and 'verification' and give an example of each. [3 marks]

(Total = 23 marks)

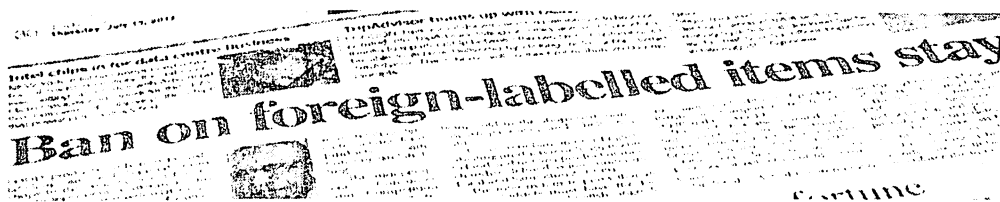
3. (a) Define 'pre-requisite programme (PRP)' and state its significance to HACCP. [2 marks]
- (b) Discuss the significance and the relationship of CXC 1-1969 to HACCP. [4 marks]
- (c) Discuss ONE of the significant changes in CXC 1-1969 Rev, 2020 for ANY ONE of the following: [2 marks]
- (i) PRP.
  - (ii) HACCP pre-steps.
  - (iii) HACCP principles.
- (d) Food safety or quality management systems are made up of collections of written documents. Fully complete the pyramid of the document hierarchy. [5 marks]
- (e) Differentiate between the two main sections of ISO 22000:2005. [3 marks]
- (f) Discuss the requirements for 'Records' according to clause 4.2 of ISO 22000:2005. [2 marks]

(Total = 18 marks)

4. (a) Differentiate between 'food safety audit' and 'quality audit'. [2 marks]
- (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 what constitutes 'non-conformity' during audit assessment of quality/safety management systems. [4 marks]

(Total = 15 marks)

5. (a) (i) Name the TWO main national food legislations. [1 mark]
- (ii) What is the name of the important international agreement in relation to food safety. [1 mark]
- (iii) Define the term 'food' as it appears in schedule 7, section 4 of FSR 2007. [1 mark]
- (b) State the clause in FSR 2007 and the name of the mandatory standard used in executing ban shown in this newspaper article. [2 marks]



- (c) Discuss the status of PNG National Food Control System. Include both impediments and ways of improvement. [5 marks]
- (d) Differentiate between a 'standard' and a 'technical regulation' and comment on 'mandatory standards'. [3 marks]
- (e) Conformity assessment is used to determine if the relevant requirements of the technical regulation or standard are fulfilled. Give TWO examples of conformity assessment. [1 mark]
- (f) 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).

(Total = 18 marks)