



FACULTY	AGRICULTURE, ENGINEERING AND NATURAL SCIENCES		
SCHOOL	AGRICULTURE AND FISHERIES SCIENCES		
DEPARTMENT	FOOD SCIENCE AND SYSTEMS		
SUBJECT	FOOD TOXICOLOGY		
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DURATION	3 HOURS	MARKS	100

Second opportunity Examination

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This question paper consists of **three (3)** pages excluding this front page.

Instructions

- Section A: Compulsory
- Section B: Answer any two (2) questions

SECTION A**[60]****QUESTION 1****[30]**

- a) Explain the reasons for plants to produce toxins. **[2]**
- b) Explain why people are likely to get food poisoning when they consume food that is raw or undercooked. **[2]**
- c) Name and explain the poisoning you are likely to get from consuming contaminated apple Juice. **[2]**
- d) Differentiate between food infection and food intoxication. **[4]**
- e) Explain the difference between Dose and Dose-response. **[4]**
- f) State two (2) model organisms for toxicological fingerprinting and briefly explain how they work. **[4]**
- g) Describe the procedures that should be performed when handling safety issues connected with cell and tissue cultures. Provide one (1) example of these procedures. **[6]**
- h) Name three (3) heavy metals and discuss their health impact. **[6]**

QUESTION 2**[30]**

- a) Explain the effect of Al prolonged exposures on human health. What are the main sources of Al found in the human body? **[4]**
- b) What are the main differences between active transport and passive transport? **[6]**
- c) Briefly explain the two (2) types of xenobiotic metabolism. Provide one (1) relevant example for each type. **[6]**
- d) State six (6) responsibilities of the inspection services, and list two of the components of a national food control system. **[6]**
- e) Name and explain two (2) model organisms for toxicological fingerprinting. **[8]**

SECTION B

[40]

QUESTION 1

[20]

Process-induced toxins are toxins formed during the development of food processing technologies such as sterilization, pasteurisation, and irradiation often result in chemical changes in the food components.

- a) Define process-induced toxins. [2]
- b) Discuss the causes of process-induced toxins formation in food. [3]
- c) List any four processed food products where Acrylamide can be formed. [4]
- d) Apart from Acrylamide, Name three (3) other toxicants that are produced during food processing and explain how the toxin is formed. [6]
- e) Discuss the health risks associated with the three (3) process-induced toxins that you discussed above in question 1(d). [5]

QUESTION 2

[20]

Setting up reliable and reproducible *in vitro* toxicological testing methods is an essential process in Toxicology.

- a) Discuss the main four (4) categories of factors to develop a robust method. Support your answer with relevant examples for each category. [12]
- b) Explain two ways to implement a developed method. Provide relevant examples for each way. [8]

QUESTION 3

[20]

Standards are norms that create common ways of working. The development of Namibian standards undergoes several stages.

- a) ISO Standards are well-known and internationally recognised categories of standards, list two (2) of these standards that are relevant to food production and discuss their advantages for food companies. [8]
- b) State the stages of developing standards in Namibia and support your explanations with relevant examples. [12]

QUESTION 4**[20]**

You visited your friend, and she offered you a glass of milk. After taking the milk, you start having stomach cramps and you remember that you are intolerant to milk.

- a) Define food intolerance. **[3]**
- b) Name three (3) food products associated with food intolerance **[3]**
- c) Apart from diarrhoea, state other symptoms associated with food intolerance in humans. **[4]**
- d) Explain the mechanism and development of lactose intolerance. **[10]**

END OF THE EXAMINATION