



(The University of choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

**UNIVERSITY EXAMINATIONS
2023/2024 ACADEMIC YEAR**

**YEAR FOUR FIRST SEMESTER EXAMINATIONS
(Main examination)**

BACHELOR OF SCIENCE IN FOOD SCIENCE AND TECHNOLOGY

COURSE CODE: AFT 407

COURSE TITLE: NON ALCOHOLIC BEVERAGE TECHNOLOGY

DATE: 19th Dec, 2023

TIME: 8 – 10 AM

Instructions: This paper consists of 5 questions
Answer question 1 and any other 3 questions
Ensure your answers are clearly and logically written
All line diagrams drawn should be clear and clearly labelled

Question One (25 marks)

- (a) Explain the difference between bottled water and mineral water
(2 marks)
- (b) You have been employed as a project manager for a start-up water bottling company. Give a concise outline the safety precautions the company should undertake to deliver a quality product to the market.
(7 marks)
- (c) With the aid of diagrams, describe the operating principles and area of application of the following processing machinery
- i. CTC machine
 - ii. Rotary roaster
 - iii. Fluidised bed dryer
- (6 marks)**
- (d) With the aid of a flow diagram briefly discuss the production process for flavoured milk
(5 marks)
- (e) Outline the risks to consider in the processing of
- i. Cocoa
 - ii. Tea
 - iii. Coffee
- (5 marks)**

Question Two (15 marks)

- (a) Distinguish between the following fruit based beverages
- i. Fruit juice
 - ii. Nectar
 - iii. Concentrate
 - iv. Squash
 - v. Single strength juice
 - vi. Concentrated juice
 - vii. Cordial
- (10 marks)**
- (b) Describe the typical cocoa roasting process
(5 marks)

Question Three (15 marks)

- (a) State and briefly describe the microbiological tests in tea processing
(6 marks)
- (b) Briefly discuss the types of artificial sweeteners used in soft drinks;
(9 marks)

Question Four (10 marks)

- (a) Describe the production process of the following tea beverages

- i. Black tea
- ii. Instant tea
- iii. Green tea

(6 marks)

(b) Briefly discuss the following phytochemical as found in tea based beverages

- i. Theaflavins
- ii. Thearubigins

(4 marks)

(c) Draw and discuss the flow diagram for the cocoa powder production process

(5 marks)

Question Five (15 marks)

(a) Outline the steps followed in the processing of green coffee, and conversion of green coffee into a beverage, hence state the precautions that need to be observed

(6 marks)

(b) Discuss briefly the process of coffee roasting and the changes that coffee berries undergo during roasting

(9 marks)