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**TECHNICAL UNIVERSITY OF MOMBASA**  
**FACULTY OF APPLIED AND HEALTH SCIENCES**  
**DEPARTMENT OF PURE & APPLIED SCIENCES**  
**UNIVERSITY EXAMINATION FOR:**  
**BACHELOR OF SCIENCE IN FOOD TECHNOLOGY AND**  
**QUALITY ASSURANCE**

AFS 4203: FOOD PLANT HYGIENE AND ENVIRONMENTAL MANAGEMENT

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2016**

**TIME: 2HOURS**

**DATE:14May2016**

**Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other  
TWO questions.

**Do not write on the question paper.**

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**Question ONE**

(a) (i) Outline Four factors to consider during food plant construction and installation of equipment (4marks)

(ii) Explain the Two methods of disinfecting food plants (4marks)

(b) (i) List TWO disadvantages of wood as a material used for constructing contact surfaces for food processing equipment (2marks)

- (ii) List Two advantages of aluminium as a material used for constructing contact surfaces for food processing equipment (2marks)
- (c) Define:
  - (i) Cleaning (1mark)
  - (ii) Disinfection/Sanitation (1mark)
  - (iii) Cleansing (1mark)
- (d) (i) Explain 3 classes of water used in the food processing industry (3marks)
  - (ii) Explain the cause of alkalinity in water and its determination (2marks)
  - (iii) Outline 2 types of hardness in water (2marks)
- (e) (i) Define zoning of food plants and explain its importance (2marks)
  - (ii) Outline 2 requirements for zoning of food plants (2marks)
  - (iii) Outline 4 specific requirements for staff facilities in a food plant (4marks)

## **Question TWO**

Discuss the following methods of treatment of wastes from food plants

- (a) Chemical treatment (10marks)
- (b) Thermal treatment (10marks)

## **Question THREE**

- (a) Explain 8 principles of hygienic design of food plant equipment (8marks)
- (b) Discuss cleaning-in-place of food plants (12marks)

## **Question FOUR**

- (a) Discuss the following chemicals used for disinfecting food plants:
  - (i) Iodophors (5marks)
  - (ii) Amphoteric-Ampholytic bactericides (5marks)

- (b) Using appropriate equations, explain water softening through base exchange (zeolite process) (10marks)

**Question FIVE**

- (a) Discuss the following classes of detergents used in food plant cleaning:

- (i) Acid detergents (5marks)  
(ii) Detergents composed of chelating agents (water conditioners) (5marks)

- (b) Discuss the removal of suspended matter from water by coagulation and flocculation (10marks)