

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF
SCIENCE IN INDUSTRIAL CHEMISTRY**

CHIN 452: INDUSTRIAL WASTE MANAGEMENT

STREAMS: BSC. CHIN

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 16/04/2025

2.30 P.M. – 4.30 P.M.

INSTRUCTIONS

- Answer all questions in section A and any two in section B.
- Do not write anything on the question paper.

SECTION A

QUESTION ONE (30 MARKS)

- Discuss the steps of conducting waste audit in a textile industry. (4 marks)
- Briefly describe the objectives of the sustainable waste management Bill 2021 Kenya. (3 marks)
- Discuss the functional elements of solid waste. (6 marks)
- Describe stabilization ponds as a method of wastewater treatment. (4 marks)
- Explain the meaning of the following terms with respect to industrial waste management
 - Proportioning
 - Equalization
 - Neutralization. (6 marks)
- State the advantages and disadvantages of incineration. (4 marks)
- Discuss the current challenges facing wastewater treatment plants. (3 marks)

QUESTION TWO (20 MARKS)

- a) Discuss volume reduction as an alternative for waste reduction. (10 marks)
- b) Explain each of the following methods as used in treatment and disposal of sludge solids.
 - i) Anaerobic and aerobic digestion
 - ii) Vacuum filtration
 - iii) Sludge lagooning
 - iv) Centrifuging
 - v) Drying beds. (10 marks)

QUESTION THREE (20 MARKS)

- a) Discuss five artificial methods of wastewater disposal. (10 marks)
- b) Discuss the challenges of waste management in Kenya. (4 marks)
- c) Explain the 3R concept in the hierarchy of waste management. (6 marks)

QUESTION FOUR (20 MARKS)

- a) Explain 5 methods for the treatment of Industrial waste waters from pulp and paper mill industry. (10 marks)
 - b) Explain the effects of solids and waste waters from metal plating industry to the following;
 - i) Wastewater treatment plants
 - ii) Lakes and rivers
 - iii) Land. (6 marks)
 - c) Compare lagooning and anaerobic digestion when mitigating organic dissolved solid in industrial waste waters. (4 marks)
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