



(University of Choice)

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

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2023/2024 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER EXAMINATIONS

FOR THE DEGREE

OF

**BACHELOR OF SCIENCE DISASTER MANAGEMENT AND
SUSTAINABLE DEVELOPMENT**

COURSE CODE: DSM 204

COURSE TITLE: POLLUTION CHEMISTRY

DATE: 11/12/2023

TIME: 8-10 A.M

INSTRUCTIONS TO CANDIDATES

Answer Question ONE (1) and any other TWO questions

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over.

SECTION A: COMPULSORY

Question ONE

- (a)(i) Explain the character of water with strong acids and strong bases (12 Marks)
- (ii) Briefly explain the significance of pH in water ? (3 Marks)
- (b)(i) Explain the principle behind determination of Total Dissolved Solid Solids in water (5 Marks)
- (ii) State the sources of interference in the determination in (a) above? (3 Marks)
- (iii) Given a sample of water from a mineral water container, explain the steps you would use in determining Total Dissolved Solids contained. (7 Marks)

SECTION B: ANSWER TWO QUESTIONS

Question TWO

- (a) Explain ways in which farming areas lose phosphorus (12 Marks)
- (b) Discuss ways of minimizing flash losses of soluble phosphorus in soil can be minimized (8 Marks)

Question THREE

- (a) Explain the meaning of pathogen indicator and state the characteristics of the indicator (6 Marks).
- (b) Nitrates and phosphates in a water-body can contribute to high BOD levels. Explain this statement (8 Marks)
- (c) Suggest ways of improving the level of Dissolved Oxygen in a water body that provides drinking water for a community (6 Marks)

Question FOUR

- (a) Potassium dichromate has been shown to be an effective oxidizing agent for COD determination. What other advantages make it preferable? (8 Marks)
- (b) What are the possible sources of Inorganic substance interference when Potassium Dichromate is used? Explain how the interference can be eliminated in each case (12 Marks)

Question FIVE

- a) Explain the reason for changes in taste and odor of water samples from Athi River water treatment plant in Nairobi on some days in November 2023 (5 Marks)
- b) Explain the possible categorization of various odors and taste experienced in water bodies. (7 Marks)
- c) (i) Explain “water hardness” (3 Marks)
- (ii) Identify the main reasons for greater hardness characteristics in underground water compared to surface water (5 Marks)