



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY**

**(MMUST)**

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR

THIRD YEAR FIRST SEMESTER EXAMINATIONS

FOR THE DIPLOMA

IN

CIVIL ENGINEERING

COURSE CODE: DCE 079

COURSE TITLE: PUBLIC HEALTH ENGINEERING

DATE: MONDAY 25<sup>TH</sup> APRIL 2022 TIME: 12.00PM – 2.00PM

---

**INSTRUCTIONS:**

- Answer Question **ONE** and any other **THREE** Questions
- Marks for each question are indicated in the parenthesis.
- Examination duration is **2 Hours**
- Use of Mobile phones is **NOT ALLOWED** in the examination room.

MMUST observes **ZERO** tolerance to examination cheating

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

**QUESTION ONE – COMPULSORY (25 MARKS)**

- a) State the main goals of wastewater treatment (3 Marks)
- b) Discuss any TWO classifications of water related diseases giving examples in each case (4 Marks)
- c) State the important factors to be considered while giving the layout of a water treatment plant (6 Marks)
- d) With the aid of the characteristic oxygen-sag curve describe the phenomena of natural stream purification (7 Marks)
- e) A secondary effluent has a total BOD<sub>5</sub> of 45mg/l. A BOD<sub>5</sub> test is run on this same secondary effluent at the same time using a nitrification 'inhibitor'. Using the data for this test as given below, calculate the nitrogenous BOD (Assume a 300 ml BOD bottle is used to run this test). (5 Marks)

Sample size	30 ml	50 ml	Blank
Initial DO, mg/l	8.9	8.8	9.0
Final DO, mg/l	6.0	4.2	8.9

**QUESTION TWO (15 MARKS)**

- a) State and briefly discuss any TWO water quality characteristics considered for aesthetic purposes (5 Marks)
- b) Filtration is the process of passing water through beds of sand or other granular materials. Name any TWO types of filters and further describe the filtration mechanisms (10 Marks)

**QUESTION THREE (15 MARKS)**

- a) Define the following terms as used in wastewater (5 Marks)
- Sullage
  - Odor
  - Infiltration
  - Biochemical oxygen demand
- b) Discuss with the aid of a well labeled diagram the performance of a trickling filter in the treatment of wastewater (10 Marks)

**QUESTION FOUR (15 MARKS)**

- a) Discuss any THREE major types of water pollutants (7.5 Marks)
- b) Discuss the wastewater treatment processes in a facultative pond using a well labeled diagram (7.5 Marks)

**QUESTION FIVE (15 MARKS)**

- a) Give any THREE methods of solid waste disposal (3 Marks)
- b) Name and briefly discuss any TWO main classifications of solid waste (5 Marks)
- c) Discuss the significance and operation of screening and grit removal in waste water treatment (7 Marks)