



(University of Choice)

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

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS**

**2021/2022 ACADEMIC YEAR**

**FIFTH YEAR FIRST SEMESTER EXAMINATIONS**

**FOR THE DEGREE**

**OF**

**BACHELOR OF SCIENCE IN MECHANICAL AND INDUSTRIAL  
ENGINEERING**

**COURSE CODE: MIE 573**

**COURSE TITLE: INDUSTRIAL POLLUTION AND CONTROL**

**DATE: 28<sup>th</sup> April 2022**

**TIME: 12.00-2.00 p.m.**

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**INSTRUCTIONS TO CANDIDATES**

1. This paper consists of FOUR questions
2. Answer Question ONE (**compulsory**) and any other TWO Questions
3. All symbols have their usual meaning

**TIME: 3 Hours**

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 3 Printed Pages. Please Turn Over

**QUESTION ONE**

**(30 marks)**

- a) Compare cyclones and electrostatic precipitators in terms of advantages and disadvantages as equipments used to remove particles from an air stream **(8 marks)**
- b) With the aid of a labelled diagram, explain the operating mechanism/principle of a Venturi scrubber **(8 marks)**
- c) State any five obstacles to achievement of cleaner production **(5 marks)**
- d) Discuss the following methods of industrial wastes treatment and disposal: **(9 marks)**  
(i) Stabilization (ii) Incineration (iii) Chemical Precipitation

**QUESTION TWO**

**(20 marks)**

- a) Using a diagram, explain the principle of operation of a settling chamber as a Particulate matter control device, clearly distinguishing between expansion and multiple-tray settling chambers **(12 marks)**
- b) State any four factors that can lead to an increase in cyclone efficiency **(5 marks)**
- c) State three main radiative transfer processes that radiation environment of the earth is a function of **(3marks)**

**QUESTION THREE**

**(20 marks)**

- a) State any four factors the National Environment Management Authority (NEMA) may consider when determining whether to issue a licence, in the case where noise is a concern. **(4 marks)**
- b) Discuss eutrophication as a process that leads to water pollution **(4 marks)**
- c) Discuss the differences between passive and active ecological restoration **(4 marks)**
- d) Ozone is both good and bad. Explain. **(4 marks)**
- e) Distinguish between bioaccumulation and biomagnifications **(4 marks)**

**QUESTION FOUR**

**(20 marks)**

- a) Discuss primary, secondary and tertiary treatment as steps involved in modern sewage treatment technique **(9 marks)**
- b) Use a schematic to explain the operation of a catalytic incinerator **(11 marks)**

