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(University of Choice)

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

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2023/2024 ACADEMIC YEAR**

THIRD YEAR FIRST SEMESTER EXAMINATIONS

MAIN EXAMINATION

**FOR THE DEGREE OF
BACHELOR OF SCIENCE IN DISASTER PREPAREDNESS AND
ENVIRONMENTAL TECHNOLOGY (DPET)**

COURSE CODE: DPE 304

COURSE TITLE: ENVIRONMENTAL POLLUTION AND CONTROL

DATE: 15/12/2023

TIME: 3-5PM

INSTRUCTIONS TO CANDIDATES

- This paper contains FOUR (4) questions (overleaf)
- Answer **Question One** and **ANY other Three**

DURATION 2 hours

MMUST observes ZERO tolerance to examination cheating

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

QUESTION ONE (Compulsory - 30 marks)

- (a) Explain the key features and differences between biodegradable and non-biodegradable environmental pollutants **(6 marks)**
- (b) Explain how the following meteorological process affect atmospheric pollutants' dispersal
- (i) Adiabatic Lapse Rate **(4 marks)**
 - (ii) Atmospheric stability **(4 marks)**
 - (iii) Temperature inversion **(4 marks)**
- (c) explain the following remediation techniques and assess their suitability in removal of spilled oil from soil.
- (i) Excavation or dredging **(6 marks)**
 - (ii) Biological Processes (Bioremediation) **(6 marks)**

QUESTION TWO (20 marks)

- (a) On-site wastewater treatment and disposal systems have been criticized for creating nonpoint source water pollution, especially during rains. Describe the pollutants that would be generated from on-site wastewater treatment and identify approaches that could be used to control the pollutants. **(8 marks)**
- (b) Briefly explain how water can be recycled for
- (i) Industry and **(3 marks)**
 - (ii) Urban and domestic uses **(3 marks)**
- (c) Briefly explain the importance of the following water parameters to aquatic life:
- (i) BOD **(3 marks)**
 - (ii) Turbidity **(3 marks)**

QUESTION THREE (20 marks)

- (a) Light pollution is increasingly becoming a nuisance in urban areas as well as remote areas with installations. Discuss the various forms of light pollutions and effects on ecosystems and human health **(11 marks)**
- (b) A machine with an overall noise level of 90dB is placed in a room with another machine putting out 95 dBs.
- (i). What will be the sound level in the room **(3 marks)**
 - (ii). What is the likely effect of this noise level on the occupants of the room **(3 marks)**
 - (iii). What necessary control measures would you suggest for occupant and operators of the machines **(3 marks)**

QUESTION FOUR (20 marks)

- (a) Under normal circumstances, indoor air is considered more polluted than outdoor. Why is this so? **(2marks)**
- (b) Discuss by giving examples, how indoor air pollution occurs, stating the sources, risks, and health effects **(8 marks)**
- (c) A cement factory is being established in your neighbourhood and is likely to generate large amounts of particulates into the air. Discuss two probable emission control techniques that could be used to minimise release of dust into the surrounding environment **(10 marks)**