



NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF SCIENCES
DEPARTMENT OF ENVIRONMENTAL SCIENCE AND RESOURCE MANAGEMENT
Plot 91, Cadastral Zone, Nnamdi Azikwe Expressway, Jabi, Abuja
2024_2 EXAMINATION

COURSE CODE: ESM 322
COURSE TITLE: WATER AND WASTEWATER MANAGEMENT
CREDIT: 2 Units
TIME ALLOWED: 2 Hours

Instruction: Attempt question number ONE (1) and any other TWO (2) questions. Question number one (1) carries 30 marks, while the other questions carry (20) marks each.

QUESTION 1

- i. Mention five sources of water bodies (2.5mks)
- ii. Differentiate between saline water and fresh water (2mks)
- iii. List the three types of advanced water treatment and discuss on each of it (8.5mks)
- iv. State at least five advantages and disadvantages of waste water treatment (5mks)
- v. Discuss six (6) effect of water quality deterioration (12mks)

QUESTION 2

- i. Differentiate between Micro, Ultra and Nanofiltration (6mks)
- ii. What is the difference between water treatment and wastewater treatment? (4mks)
- iii. Describe Five major classes of Wastewater treatment techniques (10mks)

QUESTION 3

- i. Discuss on the three stages, applications, advantages and disadvantages of sludge wastewater treatment (6mks)
- ii. Discuss five (5) processes leading to the deterioration in water quality (10mks)
- iii. Mention two (2) volatile organic and two (2) synthetic organic chemicals of primary maximum contaminant with their level limit (4mks)

QUESTION 4

- i. List the different types of latrine system (2.5mks)
- ii. Highlight the two major factors which water treatment technology depends on (1.5mks)
- iii. Describe the techniques for treating biodegradable wastes and non-biodegradable wastes (4mks)

- iv.** With a diagrammatic description of advanced wastewater treatment, describe the five (5) stages, applications, advantage and disadvantages of it (12mks)

QUESTION 5

- i.** Describe the global freshwater contents with its percentage (2mks)
- ii.** List the six motivational factors for reclamation and reuse of waste water (3mks)
- iii.** Differentiate between water supply development and wastewater generation (5mks)
- iv.** Discuss on five household's wastewaters disposal techniques (10mks)