



NATIONAL OPEN UNIVERSITY OF NIGERIA

UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKWE FACULTY OF SCIENCES DEPARTMENT OF ENVIRONMENTAL SCIENCE

2025_1 EXAMINATION

COURSE CODE: ESM 322

TIME: 2 HOURS

COURSE TITLE: Water And Wastewater Management

CREDIT UNIT: 2

INSTRUCTION: Attempt question number ONE (1) and any other Two (2) questions. *Question number one (1) is compulsory and carries 30 marks, while the other questions carry equal marks (20marks) each.*

1a. What is eutrophication? **(5mks)**

1b. Briefly discuss three (3) consequences of eutrophication. **(15mks)**

1c. Briefly discuss Filtration and UV Radiation methods of Water Treatment Processes **(5mks each)**

Total = **(30mks)**

2. Characterize water using its five known attributes under the following subheadings **(20mks)**

- I. Temperature
- II. Dissolved Oxygen
- III. pH and Alkalinity
- IV. Turbidity and Suspended Solids
- V. Salinity and Specific Conductance

3a. List five (5) uses to which recycled/reused waste water. **(2mks each)**

3b. Mention and discuss the effect of water contamination on man by the following pollutants

- i. Nitrates **(5mks)**
- ii. Arsenic **(5mks)**

4a. Explain the following under sub headings **(20mks)**

- i. Lagoons (oxidation ponds) **(5mks)**
- ii. Activated Sludge **(5mks)**
- iii. Trickling Filters **(5mks)**
- iv. Evaporation transpiration/ absorption (ETA) systems **(5mks)**

5a. List five (5) types of latrine systems that are existed **(2mks each)**

5b. Briefly discuss Bushrine System **(10mks)**