



National Open University of Nigeria
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Sciences
2023_2 EXAMINATIONS

COURSE CODE: ESM 322

COURSE TITLE: Water and Waste Water Management

CREDIT: 2 Units

TIME ALLOWED: 2 Hours

Instruction: Attempt question number ONE (1) and any other THREE (3) questions. Question number one (1) is compulsory and carries 25 marks, while the other questions carry equal marks (15) each

QUESTION 1

- 1a) Define freshwater (**2 marks**)
- 1b) Mention the different sources of waste water (**2 marks**)
- 1c) Briefly define water pollution and highlight at least the (3) sources of water pollution (**7 marks**)
- 1d) List any 6 processes affecting water degradation in natural waters (**3 marks**)
- 1e) Outline five (5) motivational factors for wastewater recycling and reuse (**5 marks**)
- 1f) Write short notes on any 3 of the following: i. portable water ii. Carbon filtration iii. Water Softening iv. Membrane processes v. Nanofilters (**6 marks**)

QUESTION 2 (15 marks)

- 2a) What is fresh water pollution? (**3marks**)
- 2b) Discuss any four (4) causes of fresh water pollution. (**12 marks**)

QUESTION 3 (15 marks)

- 3) List in a tabular form, five (5) water borne diseases, type of causative organism and their symptoms transmitted through drinking water and food. (**15 marks**)

Question 4 (15 marks)

- 4a) Differentiate between guidelines and standard of water quality (**3 marks**)
- 4b) Discuss any six (6) water treatment processes (**12 marks**)

Question 5 (15 marks)

- 5a) List out five (5) types of latrine systems (**5marks**)
- 5b Give a detailed description of any two of the following (**10 marks**)
 - i. The Septic Tank and Soak-Away System
 - ii. Trickling Filter System
 - iii. Activated Sludge System