



National Open University of Nigeria
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Sciences
2021_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

- 1a) State the causes of water contamination in Lakes, ponds, and reservoirs in many parts of the world. (3 marks).
 - b) Explain the *Sedimentation* as a process leading to deterioration in water quality. (7 marks)
 - c) Discuss the effects of acidification on water quality. (6 marks)
 - d) Highlight five motivational factors for recycling and reuse. (5 marks)
 - e) Explain why 1908 chlorine was used for the first time as a primary disinfectant of drinking water? (2 marks)
 - f) Highlight on the water treatment techniques that existed in 1960s? (2 marks)
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- 2a) Explain the bushrine system as a technique in wastewater disposal (5 marks)
 - b) State the types of latrine system? (5 marks)
 - c) Explain water requirement as a criteria for the desirability of latrines in regards to household waste (5 marks)
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- 3a) Discuss activated sludge system as a technique for household wastewater disposal (5 marks)
 - b) What are the basic wastewater treatment objectives (4 marks)
 - c) Explain the different levels of water treatment and their objectives (6 marks)
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- 4a) Discuss the operations of a wastewater treatment plant (5 marks)
 - b) Highlight on the technique of on-site disposal and treatment system (6 marks)
 - c) Examine septic tank as a primary on-site sewage disposal system (4 marks)
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- 5a) Discuss the potential risk of human activities on freshwater (4 marks)
 - b) Highlight the chemical elements of pH and Alkalinity on water quality (6 marks)
 - c) Discuss the chemical elements of turbidity and suspended solids on water quality (5 marks)