



National Open University of Nigeria
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Science
POP EXAMINATION 2022_2

COURSE CODE: ESM322

COURSE TITLE: Water and Waste Water Management

CREDIT: 2Units

TIME ALLOWED: 2 Hours

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

- 1a). Give an explicit definition of the terms BOD and COD **(3marks)**
- 1b). Discuss the following properties of a water body
 - i. Dissolved oxygen(7marks)
 - ii. Turbidity and Suspended Solids **(10marks)**
- 1c). Define preliminary treatment and state its major function**(3marks)**
- 1d). Why is the bush latrine system not a treatment technique? **(2marks)**
- 1e). Draw and label a structure of a flush toilet system **(5marks)**

- 2a). What is fresh water? **(1mark)**
- 2b). List 7 sources of fresh water and three sources of saline water **(5marks)**
- 2c). In the course of travelling over the surface of the land discuss the pollutants that are present in water. **(10marks)**
- 2d). List the physiochemical systems often employed in treatment of non-biodegradable wastewater **(4marks)**

- 3a). Discuss the following types of secondary treatment systems;
 - i. Subsurface absorption fields**(8marks)**
 - ii. Evaporation transpiration/absorption (ETA) system**(8marks)**
- 3b). Explain the Operation and Institutional Requirements for A Septic Tank and Soak-Away System **(4marks)**

- 4a). Attempt the justification of water and waste management studies **(10marks)**
- 4b). With the aid of a diagram show the structure of a Septic Tank and Soak-Away System**(10marks)**

- 5a). Define the role of biological components in the aquatic ecosystem **(9marks)**

5b). Explain the scope of advanced wastewater treatment (**5marks**)

5c). Describe the action involved on the biological treatment of waste water (**4marks**)