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**National Open University of Nigeria**

**Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja**

**Faculty of Sciences**

**July Examination 2017**

**COURSE CODE: ESM322 TIME: ALLOWED: 2: 30 Mins**

**COURSE TITLE: Water and Waste Water Management CREDIT UNIT: 2**

**INSTRUCTION: Answer question one and any other three questions**

1a) Give the history of Water Treatment as reported by USEPA in February 2000 with reference to:

1. Sensory Perception
2. Improvement Methods
3. Turbidity
4. Microorganisms
5. Year 1914 and 1974. **(10 marks)**

1b) List three types of water treatment processes**. (6 marks)**

1c) Explain the exchange and softening of water, what are the challenges. **(8marks)**

2a) With reference to secondary maximum contaminant levels, give five contaminants, their levels and effect. **(5 marks)**

2b) Define potable water. **(4 marks)**

2c) Give three examples each, of sources of Freshwater and non sources of Freshwater. **(6marks)**

3a) Explain the reason for the need for water and waste management. **(9 marks)**

3b) explain contaminated water and state the specific effect. **(6 marks)**

4a) State five subgroups each, for the following group of companies in Nigeria:

1. Basic Metal and Fabricated Metal
2. Electrical and Electronics
3. Motor vehicle and miscellaneous assembly **(9 marks)**

4b) explain the term water pollution and mention three (3) forms of water pollution. **(6 marks)**

5a) Explain the effect of trace metals and Mercury. **(6 marks)**

5b) What is Wastewater Reuse. **(3marks)**

c) Outline three (3) Major motivational factors for wastewater reuse**. (6marks)**