

**National Open University of Nigeria**

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

**Faculty of Science**

**APRIL, 2019\_1 EXAMINATIONS**

**COURSE CODE: ESM 322**

**COURSE TITLE: Water and Wastewater Management** **.**

**CREDIT: 2 Units**

**TIME ALLOWED: 2 Hours**

**Instruction:** Attempt question number ONE (1) and any other THREE (3) questions.

1a. Discuss the effects of the following on man **(8marks)**

1. **Nitrate**
2. **Arsenic**
3. **Pesticides**
4. **Biological Contaminants**

1b. Using the table below list causes and sources of degradation of water quality in many water resources in the world **(9marks)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | RIVERS AND STREAMS | LAKES,PONDS AND RESERVOIRS | ESTUARIES |
| **Causes** |  |  |  |
|  |  |  |
|  |  |  |
| **Sources** |  |  |  |
|  |  |  |
|  |  |  |

1c. List any four purposes that waste water may be put to, other than irrigation **(4marks)**

1d. What are the potential constraints of Irrigation reuse of wastewater are? **(4marks)**

2a What is Wastewater? (**3marks)**

2b Elucidate on how the following human activities have potential impact of on freshwater ecosystem **(12marks)**

1. Population and consumption growth
2. Infrastructural development
3. Land conversion
4. Over harvesting and exploitation
5. Introduction of exotic species
6. Release of pollutants

3a Name any five processes that cause degradation of the water quality from natural sources **(10marks)**

3b Discuss the Effects of Pesticides in water degradation **(5marks)**

4a What is Direct Potable Reuse? **(1mark)**

4b List the various sources of wastewaters according to Ogedengbe (1998) **(6marks)**

4c Mention eight forms of classes of water pollutants. **(8marks)**

5a Enumerate any five attributes that characterize an aquatic ecosystem **(10marks)**

5b Highlight the causes of freshwater pollution **(5marks)**