



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESS WAY, JABI - ABUJA.**  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF CHEMISTRY**  
**2023\_1 POP EXAMINATION.**

**COURSE CODE:** CHM 314  
**COURSE TITLE:** ENVIRONMENTAL CHEMISTRY  
**COURSE UNIT:** 2  
**TIME:** 2 HOURS  
**INSTRUCTION:** Answer question one and any other two questions.

**QUESTION ONE**

- 1a. State two sources and explain how the following can lead to water pollution
- (i) Sewage (5 mks)
  - (ii) Eutrophication (5 mks)
  - (iii) Acidification (5 mks).
- 1bi. Mention the biogeochemical cycles 2 mks
- 1bii. Write briefly on any of the biogeochemical cycles 6 mks
- 1c. Describe wastewater 4 mks
- 1d. List any two physical parameters that are usually determined in water analysis. 1 mk
- 1e. What are the two wet Chemistry analytical techniques used to carry out analysis of some environmental pollutants. 2 mks

**QUESTION TWO**

- 1a. With the aid of chemical equation where necessary, write short note on the sources and effects of the following oxides of Nitrogen and Sulphur:
- i. Nitrogen mono oxide (NO) and nitrogen dioxide (NO<sub>2</sub>) 10 mks
  - ii. Sulphur (IV) oxide (SO<sub>2</sub>) 10 mks

### QUESTION THREE

3a. The atmosphere is divided into different stratified layers because of difference in characteristics of each layer to the other, bearing this in mind:

- i. Name the first and second layer of the atmosphere 2 mks
- ii. Differentiate between the first and second layer of the atmosphere. 8 mks

3bi. In a water analysis, 5 ml of the water sample was transferred to a 200ml BOD bottle and diluted to 200 ml with organic free, oxygen saturated water. If the initial dissolved oxygen of this water sample was determined and found to be 9.1 mg/L and the BOD bottled tightly stoppered and placed in the incubator at 20<sup>0</sup> C for five days after which the dissolved oxygen was again determined and found to be 4.4 mg/L. Calculate the BOD of this wastewater.

7 mks

3bii. What information can you deduce from the BOD data obtained in 3bi above If the WHO permissible limit of BOD in water sample is 5 mg/L

3 mks

### QUESTION FOUR

4a. Explain the following

- i. contamination
- ii. pollution.

4 mks

4bi. Enumerate the sources of soil pollutants.

6 mks

4bii. What are the effects of soil pollution?

3 mks

4c. The monitoring of the presence and level of fluoride ion in water requires greater vigilant efforts than is given to chloride ion. Expatriate.

7 mks

### QUESTION FIVE

5a. Mention two effects of solid waste on the environment.

2 mks

5bi. Explain briefly composting and incineration as a solid waste disposal method.

12 mks

5bii. State one advantage and disadvantage of the product of composting.

3 mks

5biii. State one advantage and disadvantage of incineration.

3 mks