



**NATIONAL OPEN UNIVERSITY OF NIGERIA
UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE
EXPRESS WAY, JABI - ABUJA.
FACULTY OF SCIENCES
DEPARTMENT OF CHEMISTRY
OCTOBER 2022 EXAMINATION**

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

QUESTION ONE

1ai. List any four important chemical transformations that occur in the troposphere that are of environmental importance.

2 mks

1aii. Explain briefly why these chemical transformations are of environmental importance.

6 mks

1bi. Distinguish with examples between particulates and volatile organic compounds (VOCs)
Answer:

6 mks

1bii. Enumerate the effects of particulates and volatile organic compounds (VOCs).

4 mks

1c. Write short note on biological treatment of wastewater

7 mks

1d. What is the relevance of determining physical parameters in water?

3 mks

1e. Explain briefly waste disposal.

2 mks

QUESTION TWO

2a) Discuss the sources and effects of crude oil on the environment. 10 mks

2b. State the method of determining the following in the environment:

- | | | |
|------|----------------------------|-------|
| i. | Chloride (Cl^-) | 2 mks |
| ii. | SO_4^{2-} | 2 mks |
| iii. | F^- | 1mk |
| iv. | PO_4^{3-} | 2 mks |

2c. Comment on the relevance of chromatography in analysis of organic residues. 3 mks

QUESTION THREE

3ai. Describe briefly the systematic procedure of solid wastes management. 6 mks

3aii. Write briefly on the solid waste management method whose end product is compost. 8 mks

3b. What is the environmental significance of iron and manganese in water supplies? 4 mks

3c. List the stages of conventional wastewater treatment.

2 mks

QUESTION FOUR

4a. Is it right to discharge waste water into a receiving body of water (river, sea etc) without treatment? Give reasons for your answer.

11 mks

4b. If your answer to 4a above is yes. itemize what should be done before discharging wastewater into the environment or receiving body of water.

5 mks

4ci. What is water hardness?

2 mks

4cii. Mention the ions causing hardness in water.

2 mks

QUESTION FIVE

5ai. List eight (8) chemical parameters that are usually determined in water analysis.

4 mks

5aai. Why is it necessary to determine chemical parameters in water analysis?

3 mks

5b. Explain why sulphate (SO_4^{2-}) and phosphate (PO_4^{3-}) are allowed in not more than 250 mg/l and 0.005 mg/l in water supply.

4 mks

5c. Explain why there are alternative substitute for chlorine as a disinfectant for public water supplies.

6 mks

5c. State six (6) constituents of municipal wastewater.

3 mks