NATIONAL OPEN UNIVERSITY OF NIGERIA
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EXPRESS WAY, JABI - ABUJA.

FACULTY OF SCIENCES

DEPARTMENT OF CHEMISTRY

2025_2 EXAMINATIONS_

COURSE CODE: CHM 314

COURSE TITLE: ENVIRONMENTAL CHEMISTRY

CREDIT UNIT: 2

TIME: 2 HOURS

INSTRUCTION: Answer question one and any other two questions.

QUESTION ONE

1a. Explain briefly why a person would not feel hot in the highest layer of the atmosphere despite the high temperature of 2500 ^{o}C of the gases there.

6 marks

1b. Uncontrollable release of priority pollutants into the environment can really affect the environment adversely. As a way of ensuring environmental sustainability, mention and describe briefly ways by which the release of priority pollutants can be controlled.

6 marks

1ci. Give reason(s) why the release of polycyclic aromatic hydrocarbons (PAHs) into the environment is of concern in any study of environmental pollution.

2 marks

1cii. Mention four (4) sources of polycyclic aromatic hydrocarbons (PAHs).   2 marks

1di. What type of solid wastes are treated by composting?   2 marks
1dii. Describe briefly how the solid wastes in (1di) above are treated by composting.   4 marks

1diii. Highlight one advantage of composting.   2 marks

1e. State one (1) relevance or significance of determination of acidity in water analysis.   2 marks

1f. Describe briefly gravimetric determination of sulphate in an environmental sample.   4 marks

QUESTION TWO

2a. List the different biogeochemical cycles (2 marks). Define (2 marks) and explain briefly any

 one of the biogeochemical cycles (6 marks).

2bi. Complete the reaction;

$$CCl_2F_2 \ + \ UV \ \rightarrow ? \ + O_3 \rightarrow ? \ + O \rightarrow \ ?$$ 6 marks

2biii. The chemical reaction in 2bi above shows the reaction leading to a notable environmental issue or phenomena. Name this environmental phenomenon and explain it briefly.

4 marks

QUESTION THREE
3a. List the physical parameters that are relevant in water analysis.   2 ½ marks

3b. State two sources of each of the physical parameters relevant in water analysis.   10 marks

3c. Explain one significance of each of the physical parameters relevant in water analysis.
7 ½ marks

QUESTION FOUR
4a. Based on their working principle, explain briefly how the constituents of a sample mixture can be separated for identification using the underlisted techniques.

   i.   Adsorption chromatography (4 marks) ii. Partition chromatography (4 marks) iii Ion exchange chromatography (4 marks)

4b. Enumerate the step or procedure you will take or comply with in order to obtain a reliable BOD data.
8 marks
QUESTION FIVE

5) With reason(s) classify the following as air, soil or water pollutant(s) or combination of air, soil and water pollutants or combination of any of the types of pollutants.

   i)   Volatile organic compounds (VOCs) (3 marks) (ii) Oxides of nitrogen (2 marks) (iii)Heavy metals (6 marks) (iv) Polycyclic aromatic hydrocarbons (6 marks) (v) Sewage (3 marks)