



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**University Village, Plot 91 Cadastral Zone, NnamdiAzikiwe Express Way, Jabi - Abuja.**  
**FACULTY OF SCIENCES**  
**DEPARTMENT OF PURE AND APPLIED SCIENCES**  
**JULY 2017 EXAMINATION**

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

**QUESTION ONE**

1ai) Is the atmospheric level of CO<sub>2</sub> on a decreasing or increasing trend currently? Explain.  
(2 marks)

1aii) Show chemical reactions of the underlisted leading to the release of CO<sub>2</sub> into the atmosphere.  
i. Burning of fossil and agro fuels  
ii. Thermal decomposition of carbonate or rocks of limestone  
iii. Decay of plants and animals (6 marks)

1aiii) Outline and explain briefly the pathways by which soil pollutants can reach soil.  
(2 marks)

1bi) Sanitary landfill is a better solid waste disposal method than open dumping, discuss.  
(8 marks)

1bii) Mention two methods used in determining/profiling heavy metal levels in an environmental matrix. (2 marks)

1c) Write briefly on hardness of water and state the application of hardness data.  
(5 marks)

**QUESTION TWO**

2a) In a tabular form, highlight two comparison and contrast between the troposphere and stratosphere.  
(4 marks)

2bi) Give reasons why there is greater emphasis on non-point sources discharge than on point source discharge of pollutants.  
(4 marks)

2bii) Expatriate on the sources and effects of persistent organic chemicals on water. (7 marks)

### **QUESTION THREE**

3a) Describe wastewater and explain briefly the stages of conventional wastewater treatment before discharge into a water body. (13 marks)

3b) Name one example of the following:

- i. Particulates
- ii. Gaseous pollutants

(2 mark)

### **QUESTION FOUR**

4) Write short note on the sources and effects of acidification, thermal pollution and sewage on the aquatic environment. (15 marks)

### **QUESTION FIVE**

5a) Planting of trees has been advocated as a means of removing CO<sub>2</sub> emitted into the environment. Explain how this can be achieved in plants. (5 marks)

5b) Discuss with accompanying chemical equation, the ban of chlorofluorocarbons (CFCs) in the production of refrigerator, aerosol, foam and other industrial products. (10 marks).