



# **KIBABII UNIVERSITY**

**UNIVERSITY EXAMINATIONS  
2020/2021 ACADEMIC YEAR**

**FOURTH YEAR SECOND SEMESTER  
SUPPLEMENTARY EXAMINATIONS**

**FOR THE DEGREE OF BACHELOR OF CHEMISTRY**

**COURSE CODE: SCH 451**

**COURSE TITLE: ATMOSPHERIC CHEMISTRY**

**DURATION: 2 HOURS**

**DATE: 17/1/2022**

**TIME: 2-4PM**

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## **INSTRUCTIONS TO CANDIDATES**

- Answer **QUESTION ONE** (Compulsory) and any other two (2) Questions.
- Indicate **answered questions** on the front cover.
- Start every question on a new page and make sure question's number is written on each page.

This paper consists of 3 printed pages. Please Turn Over



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### **QUESTION ONE.COMPULSORY**

- [a] Describe the process that lead to particulate formation 4mrks
- [b] State the different forms of oxides of Nitrogen that are found in the atmosphere 3mrks
- [c] List Four sources from which CO<sub>2</sub> is released into the atmosphere 4mrks
- [d] Describe the mechanism of poisoning by CO 3mrks
- [e] Outline briefly the various types of interactions of toxic substances 5mrks
- [f] Explain the health effects associated with CO<sub>2</sub> 5mrks
- [g] Describe the effects of air pollution on the environment and human health 4mrks
- [h] State two reasons why the stratosphere is highly vulnerable 2mrks

### **QUESTION TWO.**

- [a] Describe briefly how the atmosphere plays an essential role as a protective shield 10mrks.
- [b] Explain with the help of equations how photochemical smog is formed 10mrks.

### **QUESTION THREE**

- [a] State the different forms of oxides of Nitrogen that are found in the atmosphere 3mrks
- [b] Explain the harmful effects of oxides of nitrogen to the environment 8mrks
- [c] State and explain the effects caused by acid rain to the environment 9mrks.

### **QUESTION FOUR.**

- [a] Describe in details the various control methods of gaseous pollutants for oxides of S, N, C 10mrks
- [b] Discuss four major air pollutants, their major sources and the health effects associated with them 10mrks

**QUESTION FIVE**

[a]. Describe the formation and removal of  $\text{NO}_x$  in the stratosphere  
6mrks

[b]. With the help of chemical equations, explain how the following constituents of tropospheric reactions are formed and removed.

- I. Ozone 3mrks
- II. Hydroxyl radical "OH"  
3mrks.

[c]. Explain the following terms

- III. Dissolved organic matter  
1 1/2 marks
- IV. Humic substances  
1 1/2 marks

[d]. State the effects caused by acid rain to the environment 5mrks