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**GARISSA UNIVERSITY**

**UNIVERSITY EXAMINATION 2018/2019 ACADEMIC YEAR FOUR**

**SECOND SEMESTER EXAMINATION**

**SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES**

**FOR THE DEGREE OF BACHELOR OF EDUCATION**

**COURSE CODE: CHE 413**

**COURSE TITLE: ENVIRONMENTAL CHEMISTRY**

**EXAMINATION DURATION: 2 HOURS**

**DATE: 04/02/2020 TIME: 09.00-11.00 AM**

**INSTRUCTION TO CANDIDATES**

* **The examination has FIVE (5) questions**
* **Question ONE (1) is COMPULSORY**
* **Choose any other TWO (2) questions from the remaining FOUR (4) questions**
* **Use sketch diagrams to illustrate your answer whenever necessary**
* **Do not carry mobile phones or any other written materials in examination room**
* **Do not write on this paper**

**This paper consists of THREE (3) printed pages *please turn over***

**QUESTION ONE (COMPULSORY)**

1. Define the following terms as used in Environmental chemistry [6 marks]
2. Pollution
3. Particulates
4. Eutrophication
5. Name the harmful radiation emitted from the sun? **[1 mark]**
6. Explain the three (3) important roles played by the atmosphere **[6 marks]**
7. Write the following abbreviated terms in full [**4 marks]**
8. DDT
9. BOD
10. PAN
11. PCBs
12. Which part of the atmosphere contains ozone layer? **[1 mark]**
13. When fuels burn in internal combustion engine at high temperature, one of the products formed is Nitrogen (II) oxide
14. Write the equation for the formation of Nitrogen (II) oxide **[2 marks]**
15. Give reason why Nitrogen (II) oxide is not formed at room temperature **[2 marks]**
16. State how Nitrogen (II) oxide affects the environment **[2 marks]**
17. Give one advantage and one disadvantage of using petrol containing tetraethyl lead in motor vehicles **[2 marks]**
18. A group of compounds called Chlorofluorocarbons have a wide range of uses but they also have harmful effects on the environment. State two:-
19. Uses of chlorofluorocarbons **[2 marks]**
20. Harmful effects of chlorofluorocarbons on the environment **[2 marks]**

**QUESTION TWO**

1. Define Photochemical Smog **[2 marks]**
2. Give a detailed explanation (with the help of equations) on how photochemical smog is formed [**10 marks]**
3. Discuss any four (4) effects of photochemical smog on humans **[8 marks]**

**QUESTION THREE**

1. What are the environmental regulations guiding Kenyan industries on solid waste pollution **[5 marks]**
2. State any three (3) man-made sources of sulfur(IV) oxide in the environment **[6 marks]**
3. Describe how the following technologies are used to control emissions of Sulphur oxides from combustion sources [**9 marks]**
4. Fuel gas desulphurization
5. Dry scrubbing
6. Coal liquefacation

**QUESTION FOUR**

1. Discuss the role of microorganisms in solid waste management [**10 marks]**
2. Discuss the effects of pesticides residues on food chain **[10 marks]**

**QUESTION FIVE**

The Kyoto protocol (1997) is an international agreement linked to the United Nations Framework Convention on climate change

1. What’s meant by term Greenhouse effect? **[2 marks]**
2. Name the six (6) main greenhouse gases that was target for the first commitment period under Kyoto protocol [**6 marks]**
3. What was the goal of Kyoto protocol **[2 marks]**
4. How does the treaty attempt to curb greenhouse gases **[4 marks]**
5. Why has the United States of America refused to participate in Kyoto [**6 marks]**