THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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MAIN EXAMINATION

AUGUST – DECEMBER 2018 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF NATURAL SCIENCE (CHEMISTRY)

PART TIME PROGRAMME

CHEM 310: ENVIRONMENTAL CHEMISTRY

Date: DECEMBER 2018	**Duration: 2 Hours**
INSTRUCTIONS: Answer Question ONE and ANY OTHER TWO Questions	

Q1. i). Define the following terms used in environmental chemistry
- a) Source
- b) Pathway of a pollutant
- c) Receptor
- d) Eutrophication
- e) Bioamplification [**10 marks**]

ii) Discuss the importance of the Atmosphere [**10 *marks***]

iii) Distinguish between the troposphere and the Stratosphere [**6 *marks***]

iv) If the RfD (reference dose = maximum oral dose of toxic substance) for methylmercury is 0.1µg kg^{-1} body weight/day, what mass of fish can 60 kg person safely eat each week if the average methyl mercury level in the fish is 0.3 µg/g [**4*marks***]

Q2. a). The COD of a water sample is 25 mg of O_2 per litre. What volume of 0.0010 mol L^{-1} $Na_2Cr_2O_7$ solution is required to titrate a 40 mL sample to end-point [**8 *marks***]

b). Explain the major causes of water pollution [**9 *marks***]

c). Explain measures that can be put in place to control water pollution [**3 *marks***]

Q3. a) Differentiate between classical smog from photo chemical smog [$\boldsymbol{6marks}$]

b) Using appropriate chemical equations discuss the formation of photochemical smog [$\boldsymbol{8\ marks}$]

c). Explain the effects of photochemical smog and control measures used to reduce the photochemical smog. [$\boldsymbol{6\ marks}$]

Q4. a). Explain why Carbon monoxide gas is more dangerous than carbon dioxide gas [$\boldsymbol{5\ marks}$]

b). Briefly explain why temperature decreases with altitude in the troposphere, but increases with altitude in the stratosphere. [$\boldsymbol{6\ marks}$]

Q5. Discuss the consequences of green house effects and the abatement of the green house effect [$\boldsymbol{20\ marks}$]

END