



MASENO UNIVERSITY
UNIVERSITY EXAMINATIONS 2016/2017

**THIRD YEAR FIRST SEMESTER EXAMINATION FOR DEGREE
OF BACHELOR OF SCIENCE ENVIRONMENTAL SCIENCE WITH
INFORMATION TECHNOLOGY**

MAIN CAMPUS

NES 305: ENVIRONMENTAL CHEMISTRY

Date: 10th December, 2016

Time: 12.00 - 3.00pm

INSTRUCTIONS:

- Answer Question ONE and any other TWO

questions.

TIME: 2 Hours

1. (a) Explain the meaning of environmental chemistry (3mks)
(b) Discuss the biochemical effect of the following
 - (i) Cyanide (15mks)
 - (ii) Lead (12mks)
2. Discuss the reaction of organic compounds in the atmosphere using methane as an example (20mks)
3. (a) Discuss the mechanism involved in the destruction of stratospheric ozone (14mks)
(b) Explain briefly three effects of ozone destruction on human health
4. Discuss classes of colloids (20mks)
5. (a) The analysis of water from a bore shows the following results in mg/l;
Ca=60, Mg=48, Na=103.5, K=19.5
HCO₃= 244, SO₄=220.8, Cl=78.1

Find out:

- i. The total hardness (4mks)
 - ii. Carbonate hardness (3mks)
 - iii. Non-carbonate hardness (3mks)
- (b) The analysis of a sample of water shows the following results in mg/l.
- | | |
|-------|----------------------|
| Na=20 | Cl=40 |
| K=30 | HCO ₃ =67 |
| Ca=5 | SO ₄ = 5 |
| Mg=10 | NO ₃ = 10 |

The concentration of strontium (Sr) is equivalent to a hardness of 2.29 mg/l and the carbonate alkalinity in this water is zero. Calculate the in Mg/l as CaCO₃

- i. Total hardness, (4mks)
- ii. Carbonate hardness (3mks)
- iii. Non- carbonate hardness(3mks)