

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2014/2015**

 **YEAR 3 SEMESTER II EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN ANIMAL HEALTH, PRODUCTION AND PROCESSING**

**AAP 2310: AQUATIC BIOLOGY AND AQUACULTURE**

**DATE: April 2015 TIME: 2 HOURS**

**INSTRUCTIONS:**

**Answer All Questions in Section A and Only TWO Question in Section B**

**SECTION A (40 MARKS)**

1. a. i. Define equivalence weight. (1mark)

 ii. What are the chemical forms which affect water alkalinity? (1.5marks)

 iii. Explain the effect of pH on water alkalinity. (4.5marks)

b. Convert the following concentrations into equivalence per litre unit:

1. 250 mg/l of sodium hydroxide (1.5marks)
2. 150 mg/l of calcium carbonate (1.5marks)

[Ca=40, Na=23, H=1, O=16]

c. i. What are the main benefits of conserving wetlands? (2.5marks)

 ii. List four main living marine resources (2marks)

 iii. Discuss the eutrophication process. (2.5marks)

 iv. List six major effects of Eutrophication (3marks)

1. a. i. Define Mariculture (1mark)

 ii. Why is mariculture practiced? (5marks)

 iii. What criteria is used to select a species for mariculture? (2marks)

 iv. List four major problems affecting mariculture (2marks)

b. Alkalinity of water can be defined as

 Alkalinity = [H$CO\_{3}^{-}$] +2[$CO\_{3}^{2-}]$

1. Name the terms in the equation (1mark)
2. A water sample has an alkalinity of 150 mg/l as calcium carbonate and pH of 7. Determine $[H^{+}]$, $\left[OH^{-}\right]$, and $\left[HCO\_{3}^{-}\right]$ (9marks)

**SECTION B: 30 MARKS – Answer any two questions**

1. a. With aid of a sketch diagram describe the benthic environment zones. (7.5marks)

b. The rate of dissolved oxygen consumption in a polluted fish pond can be expressed as:

 $\frac{-dl}{dt}=kl$

1. Name the terms in the equation (1.5marks)
2. Show that the oxygen demand exerted after time t is given as $y=lo(1-e^{-kt})$ (3marks)
3. Given K=0.25 per day and BOD5 of 6.85 mg/l for a water sample obtained from a fish pond. Calculate the initial BOD. (2.5marks)
4. a. Describe three major fish classes. (6marks)

b. Describe the major factors limiting primary productivity in aquatic ecosystems (4marks)

c. Describe the Nitrogen cycle and its importance in nutrient recycling. (5marks)

1. a. List five main reasons why fisheries are important (2.5marks)

b. Discuss the main physical factors you will consider when setting up a fish pond. (6marks)

c. i. List five major characteristics of fish considered for culture (2.5marks)

 ii. Explain briefly the nutrient composition of fish feed. (4marks)