



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

**FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE (WATER AND ENVIRONMENTAL ENGINEERING)
SET 523: ENVIRONMENTAL ECOLOGY II**

DATE: Wednesday, 30th November, 2011

TIME: 2.00 p.m. – 4.00 p.m.

INSTRUCTIONS:

- A. The Exam script contains **FOUR** questions in total
- B. Answer Question **ONE** and any other **TWO** questions

QUESTION ONE

- 1.1 Explain any **Five** Prerequisites for evolution to occur
(10 marks)
- 1.2 Explain any **Five** why a species will never achieve a perfect adaptation
(10 marks)
- 1.3 Discuss any relevant proximate and ultimate factors that are likely to ecology and evolution
(5 marks)

QUESTION TWO

- 2.1 Discuss **Four** efficiencies used to quantify the flow of energy in an ecosystem
(6 marks)
- 2.2 Under “special features of aquatic habitats”, discuss the following environmental factors likely to affect the survival of the organisms in the habitats

- 2.1.1 Density Anomaly
 - 2.1.2 Water Viscosity
 - 2.1.3 Water Solvency
 - 2.1.4 Redox Reactions
- (15 marks)
- 2.3 Define the following terminologies as is commonly applied in environmental ecology
- (a) Ecosystem
 - (b) Communities

(4 marks)

QUESTION THREE

- 3.1 Discuss the relationships of organisms and their habitats as relates to the following characteristics in population ecology
- (a) Ranges of Tolerance and the Niche
 - (b) Behavior and life cycles as adaptations to environmental variability
- (12 marks)
- 3.2 Discuss some of the drivers of the ecosystem change common today
- (10 marks)
- 2.1 Explain the major characteristics of a population
- (3 marks)

QUESTION FOUR

- 3.1 Using simple but realistic examples, explains the concepts of food chain and food web. Why is the concept of food web more realistic?
- (8 marks)
- 3.2 Explain the concept of Stable Isotope Analysis (SIA) used in the assessing the food web structure
- (8 marks)
- 3.3 Briefly explain the major characteristics of the following hydro- ecological communities
- (a) Pelagic Organisms
 - (b) Benthic Organisms
- (9 marks)