

**TECHNICAL UNIVERSITY OF MOMBASA**  
**FACULTY OF APPLIED AND HEALTH SCIENCES**  
**DEPARTMENT OF ENVIRONMENT OF HEALTH AND HEALTH SCIENCES**  
**University Examination for the Degree of Bachelor of Science in Marine Resources**  
**Management**

**BSMR 15S / Year 1 / Semester 2**

**Code: AES 4106: Introduction to Marine Ecology**

**SEMESTER EXAMINATION**

**Series:SEPT. 2017**

**TIME: 2 Hours**

**Instructions to candidates:**

This paper consist of FIVE questions

Answer question ONE (compulsory) and any other TWO questions

**This paper consists of two printed pages**

**QUESTION ONE**

SECTION A:

- i. State three factors that contribute to this pattern of oxygen distribution?[ 3 marks ]
- ii. State how best to protect endangered species in an ecosystem?[ 3 marks ]
- iii. Can the population of an organism grow indefinitely? What can limit growth?[ 3 marks ]
- iv. State two regions of the ocean (be specific) where food webs are based at least partially on chemosynthesis?[ 3 marks ]
- v. Define homeoviscous adaptation and explain why the term has significance in marine ecology? [ 3 marks ]

vi. State the classification by Lifestyle of fauna in the Indian ocean?[ 3 marks ]

vii. What are the cues that cause the up and down movement of zooplankton in the water column (diel vertical migration) and in the soft intertidal sediments? In what ways are they similar and in what ways are they different? [ 3marks ]

viii. You collect a green colored flatworm from the tropical near shore environment. To your surprise, while running some physiological measurements on the animal you find that it produces more oxygen than it consumes. How is this possible? How could you test your hypothesis? [ 3 marks ]

ix. Do scientists benefit from marine reserves? Explain? [ 3 marks ]

x. Explain the relationship between the fisheries science concept of maximum sustainable yield (MSY) and the population biology concepts of logistic growth (population growth rate and carrying capacity). [ 3 marks ]

**SECTION B:**

2. Name and explain two of the older hypotheses for the diversity of the deep-sea benthos, and describe newer evidence that seems to refute each of them.[ 20 marks ]

3. Explain the procedure of setting a biological laboratory experiment on how population between paramecium and Didimium affect one another?[ 20 marks ]

4. Explain and differentiate between the two kinds of recognized symbiotic survival relationship of mutualism and commensalisms? [ 20 marks ]

5. (a). Some scientists are concerned that the frequency and severity of El Nino events is increasing. Describe what happens during an El Nino/Southern Oscillation event, and what effects might result if the scientists are correct. [ 10 marks ]

5. (b). You really want a summer job working with a researcher who is trying to verify that the seastar, *Pisaster* is a keystone predator in the Indian Ocean. As preparation for the job interview, she asks you to design an experiment to examine the ecological effects of predation by *Pisaster*, in the rocky intertidal zone. Your employment prospects hinge on the quality of your design. Describe your experiment? (10 points).