



# **MASENO UNIVERSITY**

## **UNIVERSITY EXAMINATIONS 2017/2018**

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

#### **MAIN CAMPUS**

#### **NES 302: BIODIVERSITY AND CONSERVATION**

Date: 21<sup>st</sup> February, 2018

Time: 8.30 - 11.30am

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#### **INSTRUCTIONS:**

- Answer Question ONE and any other TWO



1. a) Explain the following terms:

- i. Genetic drift. [2 marks]
- ii. Founders' effect. [2 marks]
- iii. Inbreeding depression. [2 marks]
- iv. Species extinction. [2 marks]
- v. Metapopulation. [2 marks]

b) A Conservation Biologist undertook a survey of a plant community and obtained the following:

Species ( <i>i</i> )	Number in sample
<i>Albizia adiantifolia</i>	40
<i>Acacia senegal</i>	15
<i>Aloe succotrina</i>	15
<i>Acidossa chienouesis</i>	25
<i>Croton megalocarpus</i>	5

Calculate the species richness ( $S$ ), Shannon-wiener index ( $H'$ ), Maximum diversity ( $H_{\max}$ ), and Evenness ( $E$ ). [8 marks]

c) Explain how the theory of island biogeography can be used to estimate the necessary size, shape and proximity of protected areas. [12 marks]

2. Discuss the causes of species endangerment in Kenyan protected areas. [20 marks]

3. Explain the implications of the following in biodiversity conservation:

- a) Minimum viable population. [10 marks]
- b) Genetically effective population size. [10 marks]

4. a) Explain the problems associated with conservation of genes. [6 marks]
- b) Describe the ecological correlates of species vulnerability to extinction after habitat fragmentation. [14 marks]
5. Discuss the impact of climate change on biological diversity in Kenya. [20 marks]