MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF ENVIRONMENTAL STUDIES

SCHOOL OF TOURISM AND NATURAL RESOURCE MANAGEMENT

DEPARTMENT OF ENVIRONMENTAL STUDIES, FORESTRY AND AGRICULTURE

COURSE CODE: EBH 411
COURSE TITLE: ECOLOGICAL TECHNIQUES AND BIOMETRY

DATE: 23RD APRIL 2018 **TIME: 8.30A.M-10.30AM**

INSTRUCTIONS TO CANDIDATES

(a) Answer ALL the Questions in Section A
(b) Answer ANY THREE Questions in Section B

This paper consists of 2 printed pages. Please turn over.

SECTION A (25 marks)

Attempt ALL questions in this section.

1. Explain the differences between;
   i. Ecological survey and ecological monitoring
   ii. Descriptive and Inferential statistics
   iii. Quantitative and Qualitative data
   iv. Simple Random Sampling and Stratified Sampling
   v. Beta diversity and Alpha diversity

   (5 marks)
2. State the merits and limitations of the completely randomized block design (CRBD) **(5 marks)**
3. What is geospatial ecological data? List any two (2) methods of collecting spatial ecological data through GIS and any two (2) ways on how to use the data collected **(5 marks)**
4. List 10 physico – chemical parameters you would determine when carrying out ecosystem health assessment of Narok river. **(5marks)**
5. Discuss any two (2) current barriers to the ecological application of satellite based remote sensing approaches and with each barrier identify possible ways to overcome the limitations. **(5 marks)**

SECTION B

Attempt ANY THREE questions.

6. i. Explain the mark – release – recapture technique in animal population estimation. **(5 marks)**
   ii. Describe how you would employ this technique to estimate population size of a fish species in an enclosed reservoir **(5 marks)**
   iii**.** Explain the assumptions made when using this technique in population size estimation**.** **(5 marks)**

7. Discuss the ecological techniques you would employ to undertake the following studies;
   i. Determine species diversity, abundance and succession along the shores of Lake Naivasha,
   ii. Determine grass species diversity and abundance in Maasai Mara University Botanical garden.

8. Describe an ecological study where each of the following data analysis techniques would be employed to analyse and interpret the data;
   i. Linear regression **(5 Marks)**
   ii. Analysis of variance **(ANOVA)** **(5 marks)**
   iii. Chi square test **(5 marks)**
9. (a) A variety of universal practical approaches exist for investigating the biotic and abiotic components of ecosystems. The traditional means of collecting ecological data is through manual, field-based observation. With three points, explain why you should discourage an ecologist from using this method and instead choose a remote sensing approach **(6 marks)**
   (b) With three (3) points, highlight the role of Landsat satellite program in ecological applications. Stress on the history, various bands and the monitorable ecological attributes **(9 marks)**

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