

UNIVERSITY OF FORT HARE

**ANIMAL DIVERSITY AND
CONSERVATION 1
ZOO 314**

DEGREE EXAMINATIONS

JUNE

2017

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Time: 3HRS
Subject: ZOO 314
Marks: 100

**This paper consists of FIVE (5) pages including the
cover page**

Internal Examiners

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INSTRUCTIONS

**Answer ALL QUESTIONS in Section A
and
Answer ANY TWO QUESTIONS in Section B.**

Mark allocation for each question is indicated by the number in [square brackets]

SECTION A

Answer BOTH Questions 1 and 2.

Question 1 [30 marks]

Fossils are the preserved remains of life forms from the past and the totality of fossils is known as the fossil record.

- What are the five different ways in which fossils can be formed? [5]
- Explain the process of fossilization. [5]
- What does the fossil record indicate? [5]
- With examples, what were the different dispersal mechanisms of fossil animals? [5]
- The Earth is believed to have been formed some 4.5 billion years ago. Describe some of the events that characterized the oldest Earth. [10]

Question 2 [30 marks]

- Consider the hypothetical comparison of two communities of large mammals, as shown in Figure 1. Each 'type' of animal in the diagram can be considered a species in this scenario. Which community has a higher species richness? Which community has a higher species diversity? Provide a justification for each of your answers. [4]

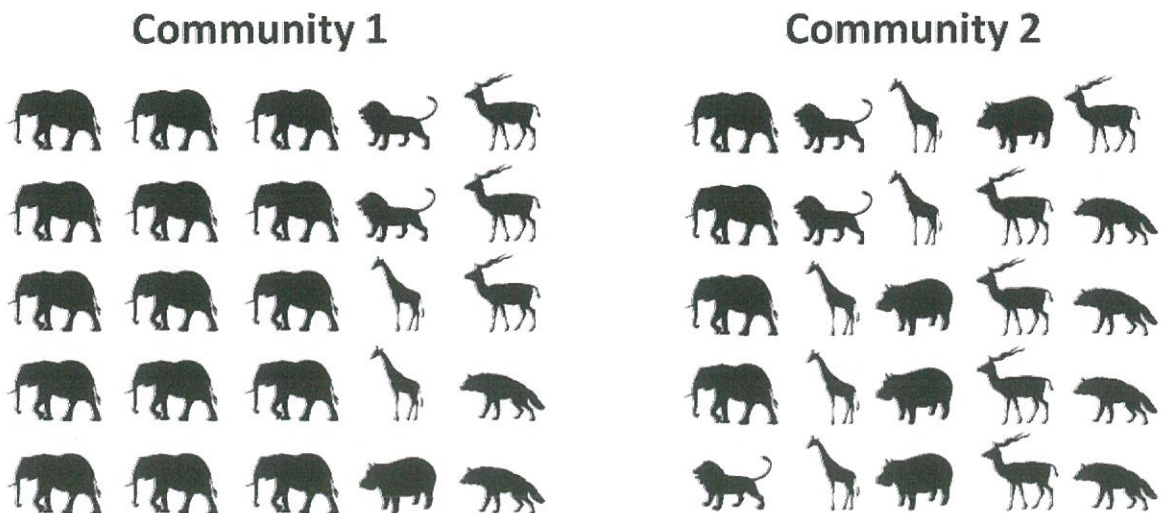


Figure 1: Hypothetical communities of large mammals

- b) Explain the global pattern of a latitudinal gradient in species richness from the point of view of the climatic stability hypothesis, the area hypothesis and the mid-domain effect. [6]
- c) Consider a fragment of natural tropical forest surrounded by a human-transformed landscape. Explain two broad types of edge effects that might change the ecology of the forest edge, providing an example of each. [4]
- d) Discuss three ecological differences between human-caused habitat fragmentation and naturally fragmented landscapes. Consider factors such as the habitat structure, suitability for wildlife, contrast (abruptness) between patches, or edge effects. [6]
- e) The extrinsic value of biodiversity can be broadly categorized into direct and indirect use values, as well as non-use values. Explain the meaning of each of these three categories and provide an example of each. [6]
- f) Give two reasons why international treaties are important for the legal management of biodiversity and conservation. Provide an example of one major international treaty and what it aims to achieve. [4]

SECTION B

Answer any TWO of Questions 3 – 6.

Question 3 [20 Marks]

Systematics seeks not only to show the organisation of biodiversity on earth but also demonstrate the unified evolutionary history of this diversity. If the 30 bp mtDNA sequence of Taxon 1 below is considered the out group (point of reference) amongst the four taxa, analyse the sequences of all taxa, construct the character states table and use the data matrix thereof to construct the phylogenetic relationship of the four taxa.

Taxon 1: AAGCTTCATAGGAGCAACCATTCTAATAAT
Taxon 2: GTGCTTCACCGACGCAGTTGCCCTCATGAT
Taxon 3: AAGCTTCACCGGCGCAGTTATCCTCATAAT
Taxon 4: GTGCTTCACCGAGGCAGTTGTCCTTATAAT

Question 4 [20 marks]

- a) Define what is meant by the term Biogeography, then compare and contrast between ecological and historical Biogeography. [10]
- b) Describe the three arguments that Wegener used as evidence for continental drift and explain why his arguments were not accepted by the scientific community of the time. [10]

Question 5 [20 marks]

- a) What is an invasive species? Are they always exotic? [2]
- b) Provide four characteristics that make for a good invader? [4]
- c) Describe two factors that are generally considered to make a habitat susceptible to invasion? [4]
- d) Explain two negative impacts of invasive species on biodiversity? [4]
- e) Explain the three broad-level options for managing species invasions. [6]

Question 6 [20 marks]

- a) Identify and describe the relevance of five biological methods used in systematics to demonstrate the concept of evolution. [5]
- b) What was the Ediacaran fauna? [8]
- c) Explain the concept of the 'greenhouse effect' with regards to atmospheric warming. [2]
- d) Discuss how human activities have contributed to the recent trends in global warming and why predicted climatic change in the next 100 years is considered a major threat to biodiversity? [5]

[END OF PAPER]