UNIVERSITY OF FORT HARE

ZOO511

DEGREE EXAMINATIONS

JUNE 2016

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Time: 3 HOURS

Subject: ZOO 511

Marks: 120

This paper consists of 5 pages including the cover page

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INSTRUCTIONS

Please use a different answer book for each question.

Answer any THREE (3) questions from Section A
AND
Answer any TWO (2) questions from Section B.

Number your answers correctly using the same numbers as on the question paper.

SECTION A

(Answer any THREE (3) questions)

Question 1

We use ecosystems for many reasons such as food acquisition, health sustainability and spiritual values. Using examples discuss how this can impact biodiversity both negatively and positively. (30 MARKS)

Question 2

Describe the process of landscape fragmentation change as proposed by Forman (1995) and its consequences to insect diversity. How do various insect groups respond to landscape change at individual, population and community levels? (30 MARKS)

Question 3

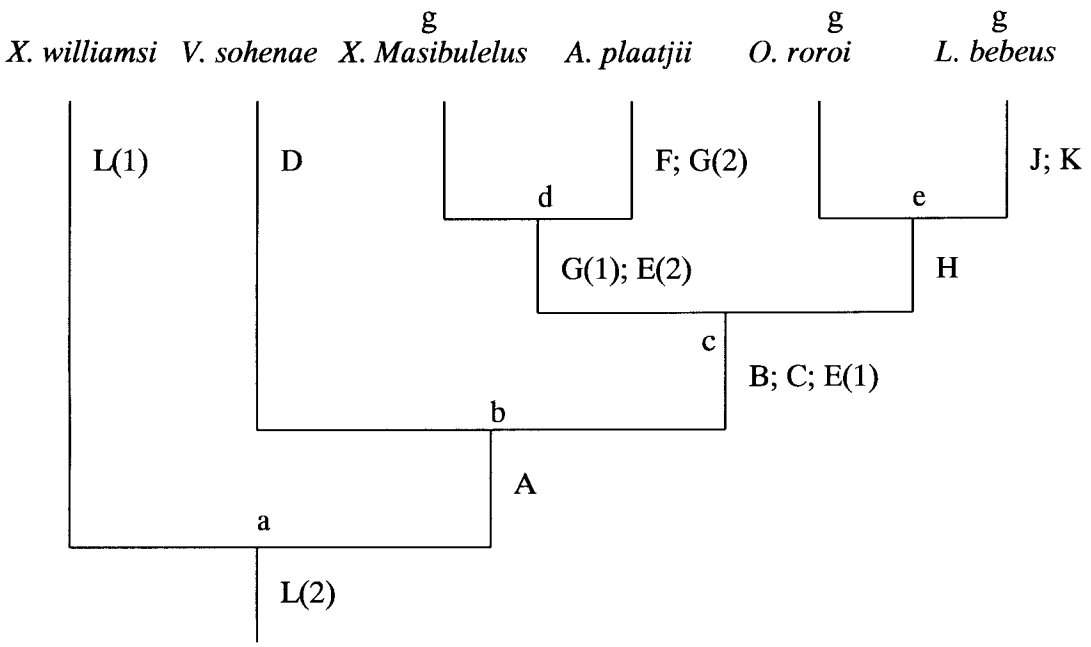
Set up and discuss Hypothetical Scenarios depicting Current Management and Increased Ecosystem Services with regards to biodiversity conservation, waste water dilution, and streamside vegetation maintenance. (30 MARKS)

Question 4 (answer both parts – 4.1 & 4.2)

4.1 - For conservation efforts to succeed in Africa, the support of local communities that share the environment with endangered animals is critical. One strategy of community-based conservation is the co-management or joint management of a protected area. Using at least TWO successful examples from Africa, discuss why (if implemented correctly) this approach to conservation is more likely to succeed on the continent over other conservation methods. (10 MARKS)

4.2 – The cladogram below represents the inter-relationships of the species of the subfamily Honourinae of the family Zoologidae. It is based on characters A-L and their character states. States of multi-state characters are shown in parenthesis following the character designation. Other characters are two-state characters (absence/presence) of which only presence is shown (naked letters). Lower-case letters are node names. Please inspect the cladogram carefully and answer the following questions:

a) List the sister groups and/or sister taxa you can identify in the cladogram. Justify your selection and specify the taxa comprising each of these groups. (6 MARKS)
b) Sort the characters and character states according to synapomorphies (shared derived), autapomorphies (unique derived) and homoplasy (reversal, parallelism, convergence) and justify the placement of each character or character state in any of these categories. (5 MARKS)
c) Can a character or character state fall under more than one category? If you think they can please explain using examples from the cladogram. (3 MARKS)
d) A study of the food habits of the subfamily Honourinae has shown that they all feed on zooplankton. While most species were filter feeders, *X. Masibulelus*, *O. roroi* and *L. bebeus* turned out to be grazers. Use this information to show how these modes of feeding evolved in this subfamily. How many different potential pathways are there, and if more than one which is the most parsimonious? [To show evolutionary events you can redraw the cladogram without the characters (they are irrelevant for this question) and indicate where you think an evolutionary event took place, or use the existing node names in your writing. (6 MARKS)



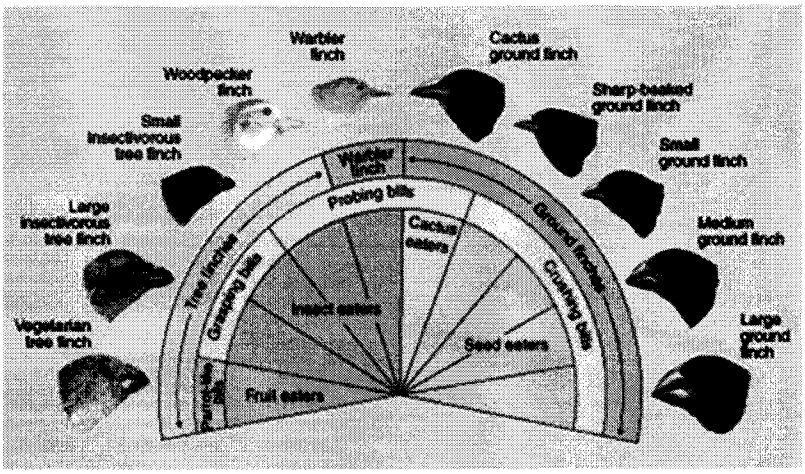
SECTION B

(Answer any TWO (2) questions)

Question 5 (answer both parts 1 and 2)

Adaptation

Magurran, 1998; Lomolino et al., 2006; Morrone, 2009



Drift

Malhotra & Thorpe, 2000; Morrone, 2009

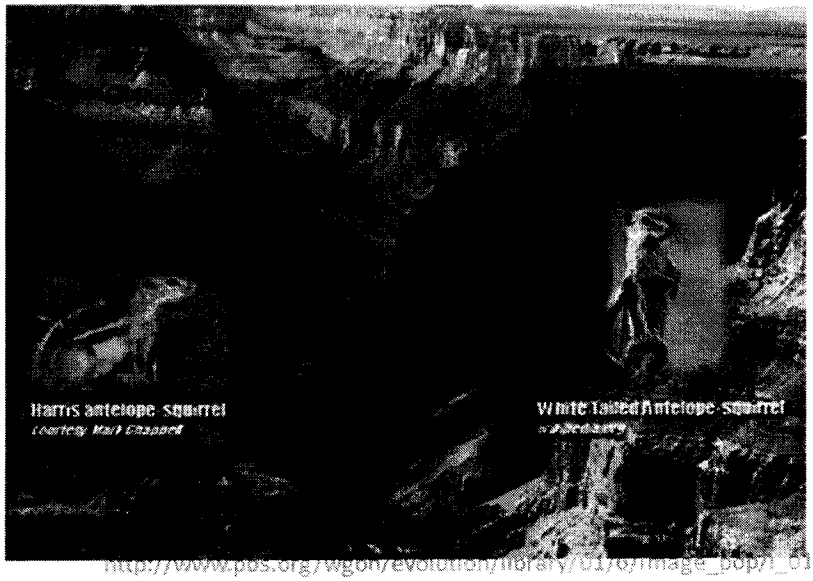


Figure 1: Main hypotheses to explain phenotypic evolution or lineage diversification

5.1 With reference to any animal species of your choice describe the difference between the two main processes that underlie lineage diversification:Drift and Adaptation and natural selection). You may use Figure 1 (a) as a guideline in your answer. (5 MARKS)

5.2 Discuss what might have led to the diversification of the finches and how it differs from what lead to the formation of the two species of antelope squirrel shown in the diagram. You must in your answer refer to examples of other species especially your Honours project study organism. (10 MARKS)

Question 6

Discuss the insect's instrumental values and the environmental philosophy for their conservation including its ethical consideration. (15 MARKS)

Question 7

From the list below, describe how each of the five integrated pest management (IPM) tactical components can impact the conservation of insect fauna within agricultural ecosystems

1. Economic injury level
2. Genetic control
3. Host plant resistance
4. Biological control
5. Cultural control (15 MARKS)

END OF PAPER