

UNIVERSITY OF FORT HARE
SEMESTER EXAMINATIONS: JUNE 2013

ZOOLOGY 314
Animal Diversity and Conservation 1
(Systematics, Biogeography and Conservation)

TIME: 2 HOURS

Code: ZOO 314

MARKS: 100

THIS QUESTION PAPER CONSISTS OF TWO PAGES

INTERNAL EXAMINER

Dr F. Génin

Mr. Kotey

EXTERNAL EXAMINER

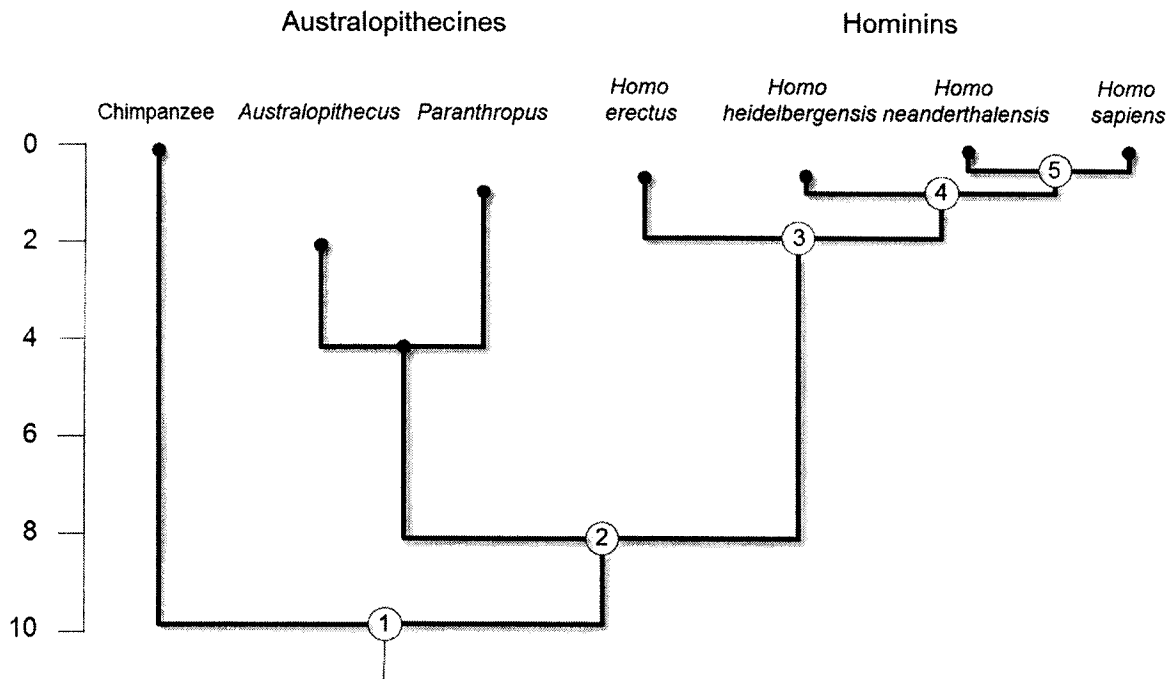
Dr Riashna Sithaldeen

Instructions to Candidates

Answer any **TWO (2)** questions

QUESTION ONE

Study the phylogeny below.



- List of characters:
- absence of tail
 - Forward shift of foramen magnum
 - Reduction in canine size
 - Presence of an occipital bun
 - Major increase in brain size ($900 - 1400 \text{ cm}^3$)
 - Presence of a mental eminence
 - Transition from quadrupedal to bipedal pelvis

- (a) Explain where these characters belong on the phylogenetic tree (14)
- (b) Name a synapomorphy for any subclade on the tree (3)
- (c) Identify a pair of sister taxa on the tree (2)
- (d) Name an autapomorphy for any terminal taxon (species) (3)
- (e) Which node (give a number) identifies the root of this tree? (2)
- (f) What is the role of the outgroup in this phylogeny? (6)

- (g) Discuss some of the theories that have been proposed to explain the evolution of bipedalism in the hominin lineage. (20)

(50 MARKS)

QUESTION TWO

Compare the procedures of molecular and geological dating, including the following subheadings in your answer:

- (a) Sources of molecular and geological age estimates (5)
- (b) BRIEF summary of methods of analysis (5)
- (c) Absolute vs relative dates (5)
- (d) Fossil calibration (5)
- (e) Summary of relative reliability of the two dating methods (5)

(25 MARKS)

- 2.2 Explain the concepts of homology and analogy. In particular, explain how they are used as evidence for macro-evolution and micro-evolution, respectively. (25)

(50 MARKS)

QUESTION THREE

- 3.1 Explain the possible reasons why mountainous regions have high species richness and high levels of endemism.

(50 MARKS)

QUESTION FOUR

- 4.1 Describe the sequence of continental rifting that led to the fragmentation of Gondwana. Why do some scientists link this to the radiation of mammals? (25)

- 4.2 Biodiversity surveys include acoustic surveys. Explain why this method is useful developing an example. (25)

(50 MARKS)

TOTAL 100

UNIVERSITY OF FORT HARE
SEMESTER EXAMINATIONS: JUNE 2013

ZOOLOGY 314
Animal Diversity and Conservation 1
(Systematics, Biogeography and Conservation)

TIME: 2 HOURS

Code: ZOO 314

MARKS: 100

MARKING GUIDE

INTERNAL EXAMINER

Dr F. Génin

Mr. Kotey

EXTERNAL EXAMINER

Dr Riashna Sithaldeen

QUESTION ONE

This question refers to two assignments (one on phylogeny and one on bipedalism). The questions are quite straight forwards.

QUESTION TWO

2.1 The students need to explain the principles of stratigraphy, fossil calibration and absolute dating using examples.

2.2 This question is straight forward and was abundantly illustrated in class.

QUESTION THREE

3.1 The students need to invoke endemism (*in situ* evolution), refuges, and topographic complexity.

QUESTION FOUR

4.1 The question refers to a practical on continental drift. They need to explain the principle of vicariance.

4.2 The question refers on a fieldtrip where the advantages of the method was explained, using in particular the example of a newly discovered frog, endemic to hogsback area.