UNIVERSITY OF FORT HARE

ANIMAL DIVERSITY AND CONSERVATION 2
ZOO 315

SEMESTER EXAMINATIONS: JUNE 2023

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Time: **2 HRS**

Subject: **ZOO 315**

Marks: **100**

Internal Examiners

Dr CA Andrews
Mr LU Vumazonke

External Examiners

Dr A MacDonald (UKZN)

Instructions to Candidates

IMPORTANT! PLEASE READ CAREFULLY!

All six questions are COMPULSORY.

Answer QUESTION as INDICATED to each DIFFERENT Answer Book.

IT MEANS THAT YOU WILL SUBMIT A TOTAL OF 2 ANSWERS BOOKS.

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

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

Number of pages: 6 including cover

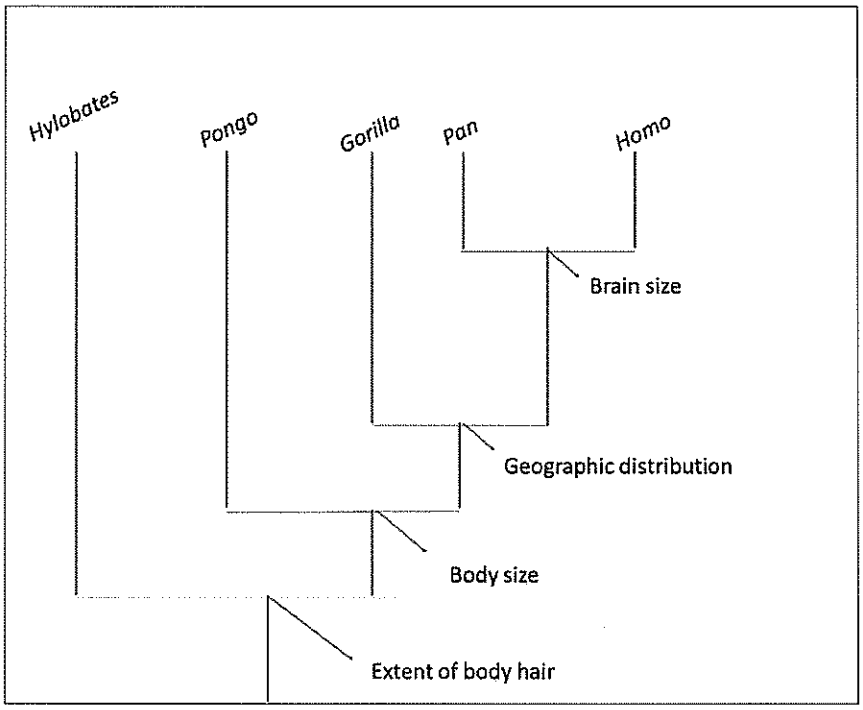
QUESTION 1 (to be answered in the first answer book)

1.1. The Order Primates has several adaptions that distinguish this group from other mammals. Discuss **six** of these adaptions including brief notes on the mechanisms and how this enables primate survival in different environmental conditions, with appropriate examples where necessary. [12]

1.2. Using the character matrix below of the living apes (Superfamily Hominoidae), construct a similarity matrix (with synapomorphies only). [5]

Genus/ character	*Hylobates* (gibbon)	*Pongo* (orang-utan)	*Gorilla* (gorilla)	*Pan* (chimpanzee)	*Homo* (human)
Geographic distribution	1	1	0	0	0
Body size	0	1	1	1	1
Brain size	0	1	1	1	2
Sexual dimorphism	0	2	2	1	1
Relative limb lengths	0	0	0	0	1
Spinal curvature	0	0	0	0	1
Form of locomotion	0	0	0	0	1
Length of iliac blade	0	0	0	0	1
Divergence of big toe	0	0	0	0	1
Extent of body hair	0	0	0	0	1

1.3.Draw a simple phylogenetic tree based on the similarity matrix of only synapomorphies, including characters. [10]



1.4. Can you identify an autapomorphy in the above character set? Why did you choose this character? [3]

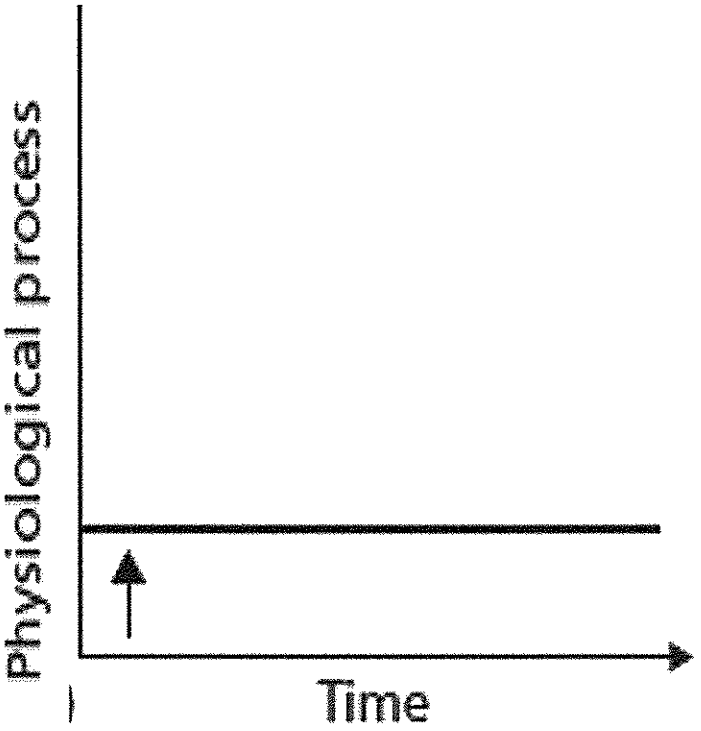
QUESTION 2 (to be answered in the first answer book)

2.1 Field primatologists can rely on several methods to investigate primate behaviour, ecology as well habitat use and acoustic biology. Discuss some of the methods that you would use to **habituate** primates in the wild as well as investigate **seed dispersal**, including techniques to measure seed dispersal ranges and seed survival. [20]

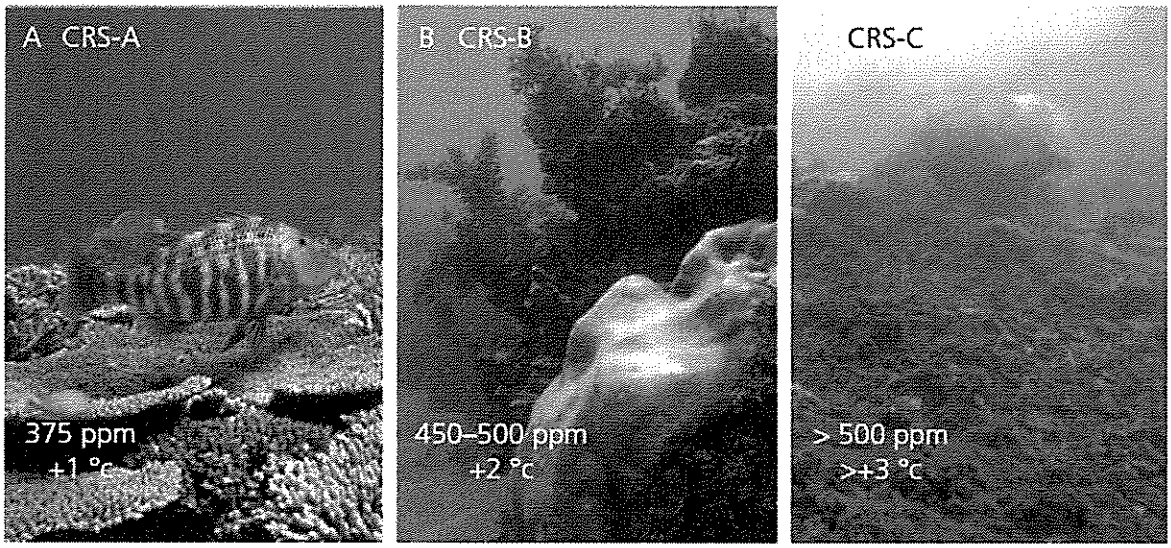
QUESTION 3 (to be answered in the second answer book)

3.1 A possible alteration in a physiological process, i.e. acclimation, following a change in an environmental factor such as an increase in temperature or a reduction in salinity is observed in an experiment on animals. Draw a plot/graph to illustrate the initial change (use an arrow to indicate this) and show an observation of no physiological change as a result of a change in the environment. [10]

(**NOTE**: Mark allocation will be: plot/graph [4]; correct labelling and arrow indicating the change on the plot/graph [6])



QUESTION 4 (to be answered in the second answer book)



The colour plate above illustrates the ecological structures predicted to form in place of the coral reefs for three different scenarios of global climate change, the **Coral Reef Scenario (CRS)-A, CRS-B, and CRS-C**. The typical anticipated ecological structures are illustrated using extant examples of reefs from the Great Barrier Reef. The atmospheric CO_2 concentration and temperature increases are shown for each Coral Reef Scenario (note that these conditions do not refer to the values measured at the photographed locations). **CRS-A scenario** assumes that the atmospheric CO_2 concentrations have stabilized at ~380 ppmv. **CRS-B scenario** assumes an increase in CO_2 levels to approximately 500 ppmv. **CRS-C scenario** assumes an increase of CO_2 to levels above 500 ppmv (Adopted from Hoegh-Guldberg *et al* 2007).

Using the plate and the information provided answer the following questions:

4.1 Name the **two** increases projected on the coral reefs for the three scenarios of global climate change? [4]

4.2 What impact will this increase cause on the coral reef? [1]

4.3 Would you consider this impact on the coral reefs to be at an individual organism's level or an ecological communities' level [1]? Give reasons for your answer [5].

4.4 What will the different impacts experienced by the coral and the algae be when exposed to the predicted CRS-B to CRS-C scenarios? [4]

4.5 How will coral reef biodiversity be impacted between CRS-B and CRS-C scenarios? [2]

4.6 What impact will the predicted CRS-B and CRS-C scenarios have on anemone fish (clown fish) behaviour? [5] How (and why) will this impact on their survival and/or fitness effect? [3]

QUESTION 5 (to be answered in the second answer book)

5.1 Briefly discuss three categories of responses that animals will show when they are confronted with changes in the environment. [9]

QUESTION 6 (to be answered in the second answer book)

6.1. Estuaries are tough places to live in because of the variability in physical conditions. Describe any **three** ways that animals living in this environment must survive changes in in salinity and give an example of animal in each of the ways. [6]

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