# UNIVERSITY OF FORT HARE

**FUNDAMENTAL CONCEPTS IN ANIMAL BIOLOGY II**
**ZOO222**

**SUPPLEMENTARY EXAMINATIONS**

**JANUARY**

**2019**

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|---|---|
| **Time:** | **180 Minutes (3 hours)** |
| **Subject:** | **ZOO222** |
| **Marks:** | **160** |

**This paper consists of 3 pages including the cover page**


**Internal Examiners**

**Prof. D. Okeyo**
**Prof. N. Vine**
**Dr. C. Tambling**
**Mr. L. Vumazonke**
**Dr. P. Patrick**

**Internal Moderator**

**Ms. PG. Tshivhandekano**


## INSTRUCTIONS

Read all questions carefully
Answer all questions

## Question 1 (Prof. Okeyo) [40]

1.1. Describe how aquatic macrophytes make the littoral regions ecologically better environments with regards to substrate, metabolites, decomposition, refugia and economics. (20)

1.2. Discuss the formation process of four fluviate lakes. (20)

## Question 2 (Prof. Vine) [40]

2.1. Explain why thermohaline circulation (the vertical mixing of the water column due to density differences) is important for marine organisms. (4)

2.2. Besides overfishing, explain the other ways in which the ocean's fisheries are negatively impacted by man. (5)

2.3. Living in the open sea has seen the organisms develop special adaptations to live in this environment. Discuss the problems they encounter and the methods by which these organisms survive. (5)

2.4. Provide are at least 4 adaptations (with examples) that rocky intertidal organisms have for withstanding wave shock? (8)

2.5. DRAW a simple MAP of southern Africa naming the MAIN OCEAN CURRENTS and indicating their FLOW DIRECTION. (5)

2.6. Describe (and explain) at least 3 physical factors that limit coral reef distribution. (6)

2.7. Match the letter in column A with the most likely species example from the list below (7).

| Letter | Characteristic |
|---|---|
| A | Uses photophores for countershading |
| B | Found in the intertidal area in the upper balanoid zone |
| C | Host of symbiotic chemosynthetic bacteria |
| D | Symbiotic dinoflagellate |
| E | Important fisheries species whose natural populations are affected by El Nino events |
| F | Part of the Pleuston |
| G | Male of species bites and attaches permanently to the female |

1) Zooxanthellae
2) Bluebottle jellyfish
3) Hydrothermal vent annelid worms
4) Barnacle

5) Hatchetfish
6) Deepsea Anglerfish
7) Anchovy

## Question 3 (Dr. Tambling) [40]

3.1. Provide four reasons why scientists want to study mammals (4)

3.2. Explain the mammalian evolution from the early tetrapod like amphibians to modern day mammals (represented by the post dinosaur extinction radiation), providing the estimated time (in millions of years ago or using geologic time periods) for each step in the process. [6]

3.3. What are the Afrotherians and provide three characteristics of two of the orders in this group. [9]

3.4. Provide four adaptations that the cheetah (*Acinonyx jubatus*) has for cursorial locomotion and explain how these adaptations allow the cheetah to run at speeds of up to 110 km / hr. [8]

3.5. What is a thermoneutral zone, provide a diagram to support your answer. [4]

3.6. What are three benefits of living in groups for mammals and explain how this benefit works? [6]

3.7. Describe how white rhinoceros (*Ceratotherium simum*) were saved from the brink of extinction. [3]

## Question 4 (Prof. Vine, Mr. Vumazonke, Dr. Patrick) [40]

4.1. Fish have developed a variety of ways to maintain their position in the water column. Providing examples of the fish which possess them, discuss (with the aid of diagrams) how these various anatomical adaptations are used to maintain buoyancy. (8)

4.2. The ability to swim efficiently depends on a fish's shape and associated swimming motion. Using drawings to assist you, name and describe the swimming movement of the following fish:
a) Eel (5)
b) Trout (5)

4.3. Define the term symbiosis (3 marks). Using fish in your examples, describe the main types of symbiosis that occur and how they differ from one another? (9 marks)

4.4. Describe five (5) main groups of fishes found in South African estuaries. (10)