

UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER 2011

TITLE OF PAPER : **INTRODUCTORY ZOOLOGY**

COURSE CODE : **B112**

TIME ALLOWED : **THREE HOURS**

INSTRUCTIONS : 1. **THIS PAPER HAS TWO SECTIONS, A AND B**
 2. **USE ONE (1) ANSWER BOOKLET FOR**
 EACH SECTION
 3. **ANSWER ANY TWO QUESTIONS FROM**
 EACH SECTION
 4. **EACH QUESTION CARRIES TWENTY FIVE**
 (25) MARKS
 5. **WHEREVER POSSIBLE ILLUSTRATE YOUR**
 ANSWERS WITH LARGE CLEARLY
 LABELLED DIAGRAMS

SPECIAL REQUIREMENTS: **NONE**

**THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN
GRANTED BY THE INVIGILATORS**

SECTION A

QUESTION 1

- a. What is the biosphere? List and describe the roles of each component. (15)
- b. Using illustrations, enumerate features which characterise all members of the phylum Chordata. (10)

[Total = 25 marks]

QUESTION 2

- a. Both Mrs Dlamini and Mrs Hlanze had babies on the same day in the same hospital. Mrs Dlamini took home a baby girl, whom she called Lindiwe. Mrs Hlanze took home a baby named Hlengiwe. Mrs Hlanze began to suspect, however, that her child had been accidentally switched with the Dlamini baby in the nursery. Blood tests were made: Mr Dlamini was type A, Mrs Dlamini was type B, Mr Hlanze was type A and Mrs Hlanze was type A. Lindiwe was type O and Hlengiwe type B. Had a mix up occurred? Explain your answer. (10)
- b. Illustrate the three general types of survivorship curves and briefly describe these. (14)

[Total = 25 marks]

QUESTION 3

- a. A population of rodents has the following life-history characteristics. Assume they are all females.

The young suffer 80% mortality in their first year;
40% between age 1 and 2 years;
20% during their third year;
15% during their fourth year;
60% during their fifth year; and all are dead at age 6
Females produce an average of 2.5 female young at ages 1, 2, 3 and 4, while producing 3 at 5 years.

Some useful equations

Survivorship of next cohort = Survivorship of last cohort - (Survivorship of last cohort x Mortality rate of last cohort)

of offspring per ♀ before death = Survivorship of cohort x Reproductive rate

a. Fill out the data on the following life-table, remembering that females produce their young on their birthdays:

Age interval	Survivorship at beginning of age interval	Mortality rate through interval	Survival rate through interval	Reproductive rate at beginning of interval
0 - 1				
1 - 2				
2 - 3				
3 - 4				
4 - 5				
5 - 6				

(12)

b. Due to changes in environmental conditions, conservationists are concerned that the rodents are endangered. Is this true? (5)

c. Define the following:

- i. carrying capacity (3)
- ii. binomial system of nomenclature (2)
- iii. sexual selection (3)

[Total = 25 marks]

SECTION B

QUESTION 4

Describe and compare digestion in hindgut and foregut fermentors.

[Total Marks = 25]

QUESTION 5

- a) survives in air if skin is kept moist and cool
- b) Respiratory system characteristic of insects
- c) Type of lung found in scorpions, pulmonate snails and some isopods
- d) lungs are found in large animals with high metabolic rates, typical of vertebrates
- e) To increase surface area the vertebrate lung is divided into
- f) The following volumes are averages applicable to man:
 - a. Tidal volume
 - b. Dead space
- g) Phospholipids that create high surface tension in alveoli
- h) Bird lungs do not have alveoli but have instead.
- i) The avian respiratory system involves the use of two groups of air sacs, and
- j) In the bird lung air flow is (hint: direction).

[Total Marks = 25]

QUESTION 6

- a) Make a large clearly labelled sketch of a neuron. (10 Marks)
- b) Describe and discuss the following:
 - i. Resting potential (7.5 marks)
 - ii. Action potential (7.5)

[Total Marks = 25]