UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER 2008

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. **IN SECTION A, ANSWER QUESTION 1 (COMPULSORY) PLUS ANY OTHER QUESTION; IN SECTION B, ANSWER ANY TWO QUESTIONS.**
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 **(Compulsory)**

1. The protective outer covering in arthropods is known as the _____

2. Arthropoda means _____

_____

3. What is metamorphosis? _____

_____

4. Protists are classified on the basis of their _____ organelles.

5. Name one feature characteristic of all members in the phylum Chordata. _____

_____

6. In reptilian eggs, the _____ provides water for the developing embryo.

7. Name one weight saving modification observed in birds. _____

_____

8. In classification, each category is called a _____

9. Name one function of the phospholipid bilayer. _____

_____

10. An individual's genetic make up is known as its _____

11. In heterozygotes, the full expression of both alleles is due to _____

12*. Name two procedures used to detect genetic defects _____

_____

13. _____ skeletons provide support from within the body.

14. Biomes with intense solar radiation, winds and little moisture are known as _____

15. The transfer of elements between the biotic and abiotic environments is illustrated by

_____

16. Give an example of an altruistic act _____

17. Heterotrophic nutrition by ingestion is known as _____ feeding.

18. Organisms which are firmly and permanently attached onto a hard surface are said to be _____

19. The number of individuals that can be supported in an area without damaging resources available is known as that environment's _____

20. Name one factor characteristic of *r*-selected organisms _____

_____

21. In heterozygotes, the intermediate expression of a trait is due to _____

_____

22. _____ is when animals choose their partners on the basis of their phenotype.

23. _____ structures have little or no function in present day organisms.

24. Give an example of a post-zygotic barrier which prevents reproduction between species. _____

[Total = 25 marks]

QUESTION 2

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

The young suffer 80% mortality in their first year;
20% between age 1 and 2 years;
20% during their third year;
20% during their fourth year;
50% 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, 4 and 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				

(18)

b. It is argued that there is a surplus in the present population that can be trapped. Is this correct? Explain your answer. (7)

[Total = 25 marks]

QUESTION 3

a. What advantages do insects have over other arthropods that have contributed to their success. (15)

b. Describe the process of conjugation in ciliates and briefly state its importance. (10)

[Total = 25 marks]

SECTION B

QUESTION 4.

(a) What is meant by 'open circulatory system'? (5 Marks)

(b) By means of suitable sketches compare the hearts of amphibians, fish and mammals (20 Marks)

[Total Marks = 25]

QUESTION 5.

Write a brief essay on EACH of the following:

(i) Mechanical digestion (6 Marks)
(ii) Autotrophic nutrition (5 Marks)
(iii) Swallowing in humans (8 Marks)
(iv) Gastric juice (6 Marks)

Total Marks = 25]

QUESTION 6.

Describe and discuss the formation of urine in mammals. (25 Marks)

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER 2007/2008

TITLE OF PAPER: CRYPTOGAMIC BOTANY

COURSE CODE: B201

TIME ALLOWED: THREE HOURS

INSTRUCTIONS:
1. ANSWER ONE QUESTION FROM EACH SECTION
2. EACH QUESTION CARRIES TWENTY FIVE (25) MARKS
3. ILLUSTRATE YOUR ANSWERS WITH LARGE AND CLEARLY LABELLED DIAGRAMS WHERE APPROPRIATE

SPECIAL REQUIREMENTS:

NONE

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SECTION A
Bacteria

QUESTION 1

a) Draw and fully label the two types of bacterial cell walls revealed by the popular differential staining technique. (10 marks)

b) Prepare a table to show differences in wall composition. (10 marks)

c) What are the functions of the cell wall in bacteria. (5 marks)

[TOTAL MARKS = 25]

QUESTION 2

a) Using sketches and named examples, explain asexual reproduction methods in bacteria. (10 marks)

b) Differentiate between a recombinant and an Hfr using annotated diagrams. (5 marks)

c) Explain how recombination occurs in the conjugation of an Hfr and an F⁻ bacterium. Illustrate your answer. (10 marks)

[TOTAL MARKS = 25]

SECTION B
Fungi

QUESTION 3

(a) Discuss the various types of plasmodia found in fungi. Cite examples to enhance your answer. (10 marks)

(b) Draw the life cycle of Puccinia graminis and then explain how this fungus has ensured its survival in a changing environment. (15 marks)

[TOTAL MARKS = 25]

QUESTION 4

(a) Use diagrams and brief descriptions to distinguish between the following:
- (i) Penicillium from Aspergillus
- (ii) Rhizopus from Mucor
- (iii) a pycnidium from a perithecium
- (iv) an acervulus from a sorus
- (v) a downy mildew from a powdery mildew (10 marks)

(b) Using drawings and a dichotomous key show how cleistothecial details are used to identify the genera of powdery mildews. (10 marks)

(c) Discuss changes you think occurred in the evolution of downy mildews. (5 marks)

[TOTAL MARKS = 25]

SECTION C
Algae

QUESTION 5

Using a flow chart and illustrated examples, discuss evolution among the Chlorophyceae.

[TOTAL MARKS = 25]

QUESTION 6

(a) Discuss the methods of reproduction amongst the algae. (15 marks)

(b) Discuss the oogamous process in Chara and Oedogonium. (10 marks)

[TOTAL MARKS = 25]

SECTION D
Bryophytes

QUESTION 7

In bryophytes, gametangia are conserved but the sporophytes are variable. Discuss.

[TOTAL MARKS = 25]

QUESTION 8

Discuss the biology of Anthoceros, a hornwart. Illustrate your answer.

[TOTAL MARKS = 25]