

UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER 2009

TITLE OF PAPER : INTRODUCTORY ZOOLOGY

COURSE CODE : B 112

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) All questions = 1 mark, except * = 2 marks

1. Based on climate and the predominant vegetation in an area, the Earth is divided into broad categories called _____
- 2*. The areas named above can be defined based on their annual _____ and annual average _____
3. Define adaptation _____
4. Why are fossils relatively scarce compared to the likely number of organisms that have existed before? _____
5. What are the selection factors in the natural environment that reduce the number of surviving offspring? _____
- 6*. Explain the relationship between genotype and phenotype. _____
7. Provide answers for a, b and c.

Dominance type	How the alleles are expressed
a.	If present, one type of allele always prevails over the other.
b.	If the alleles are different, the resulting trait is a mixture of the two.
c.	If the alleles are different, both variations are fully expressed.

- 8*. Define genetic drift and cite an example. _____
9. What is the hazard of non-random mating? _____
10. Why is sickle cell anaemia a disadvantageous trait? _____
11. What is the measure of fitness for an organism? _____

12*. Biologists report that the earth currently is experiencing a major extinction event.

What is the cause? _____

13. What is a community in biology? _____

14. Why will producers always be at the bottom of a food chain? _____

15*. Assume an initial P generation crosses is $TT \times tt$, and offspring are crossed only with each other, never with their parents. What generation would produce both Tt and tt ?

Explain. _____

16. Provide answer a, b,c, and d.

Mendel's concept	Modern term
One of two contrasting forms of expression for a trait. One form is dominant and one is recessive.	a.
An organism which carries paired forms of expression of the same kind, either both of them dominant or both recessive.	b.
An organism which carries paired forms of expression of different, contrasting kind, one dominant and one recessive.	c.
An organism which carries paired forms of expression of the same kind, either both of them dominant or both recessive.	d.

[Total = 25 marks]

QUESTION 2

a. Complete the following table.

Microevolution Mechanisms	What changes the allele frequencies?
Founder Effect	
Genetic Drift	
Bottleneck Effect	
Gene Flow	
Mutation	
Non-Random Mating	

(6)

b. Cabbages, broccoli, brussel sprouts have a common ancestor, the Wild *Brassica oleracea*. The differences in their traits are the result of artificial selection or, selective breeding rather than natural selection. What do natural selection and artificial selection have in common and how are they different? (5)

c.) Define and explain the advantage of the following:

- i. Multicellularity (3)
- ii. Coelom (5)
- iii. Radial symmetry (4)
- iv. Endothermy (2)

(14)

[Total = 25 marks]

QUESTION 3



a. If mice were removed from the food web above, which organisms would be *directly* affected? (3)

b. If mice were removed from this food web, what is the likely effect on the population of *caterpillars*? Why do you think this would happen? (3)

c. If mice were removed from this food web, what is the likely effect on the population of *hawks*? Why do you think this would happen? (5)

d. Discuss in detail, the features which all members of the phylum Chordata have in common. (14)

[Total = 25 marks]

SECTION B

QUESTION 4

Write notes on the following:

- | | | |
|------|--------------------|-----------|
| i) | Gills | (8 Marks) |
| ii) | Functions of blood | (8 Marks) |
| iii) | Omnivores | (5 Marks) |
| iv) | Oestrogen | (4 Marks) |

[Total Marks = 25]

QUESTION 5

Make labelled sketches of the following:

- | | | |
|-----|------------------------------------|-----------|
| (a) | A nephron | (8 Marks) |
| (b) | A nerve cell | (8 Marks) |
| (c) | The human male reproductive system | (9 Marks) |

[Total Marks = 25]

QUESTION 6

Write one or two words that apply to EACH of the following: (2.5 marks each)

- (i) Organ of excretion in mammals
- (ii) Enzyme of starch digestion in the human mouth
- (iii) Female hormone of pregnancy
- (iv) Product of fat digestion
- (v) Muscle controlling exit from the stomach
- (vi) Where ovum enters uterus
- (vii) Hormone involved in male puberty
- (viii) Connects one axon to another
- (ix) Number of chambers in a reptile heart
- (x) Feeds only on primary producers

[Total Marks = 25]