

UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER 2013

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

1. 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.

Also assume that:

Each surviving female produces 2.5 female offspring at age 1, 2, 3, 4 and 5

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
Multiplication rate = survivorship at 3 months x reproductive rate at 3 months x initial number of individuals

Draw a table similar to the one below and use the information above to fill out the life table in your answer sheet:

Age interval	Survivorship at beginning of age interval	Mortality rate through interval	Survival rate through interval	Reproductive rate at beginning of interval	No. of offspring/female
0 - 1					
1 - 2					
2 - 3					
3 - 4					
4 - 5					
5 - 6					

(18 marks)

c. Using haemophilia as an example, illustrate why males always inherit and express X-chromosome linked traits from their mothers and never from their fathers. (7)

[Total = 25 marks]

QUESTION 2

a. Distinguish between the following:

Biosphere, community, ecosystem and biome (16)

b. Using named examples, define the following:

i. Allelopathy (3)

ii. Altruism (3)

iii. Gene flow (3)

[Total = 25 marks]

QUESTION 3

a. Using illustrations, enumerate features which characterise all members of the phylum Chordata. (10)

b. In what ways have Reptiles adapted to the terrestrial environment? (10)

c. Various patterns emerge as one proceeds along the phylogenetic tree. Using the words provided, copy and fill in the table below: Legs; Milk; Feathers; Bony skeleton; Amniotic egg; Vertebral column

Animal group	Evolutionary character
Vertebrates	
Bony fish	
Reptiles	
Birds	
Mammals	

(5)

[Total = 25 marks]

SECTION B

QUESTION 4

Employing appropriate sketches, describe the structure and function of the insect respiratory system.

[Total Marks = 25]

QUESTION 5

- (a) Make labelled sketches of the following:
- (i) A fish heart (3 Marks)
 - (ii) An amphibian heart (4 Marks)
 - (iii) A mammalian heart (9 Marks)
- (b) List five (5) functions of blood in humans (5 Marks)
- (c) What is an open circulatory system? Give an example of an animal with such a circulatory system (4 Marks)
- [Total Marks = 25]

QUESTION 6

- (a) What is a nerve impulse? _____.
- (b) _____ can swallow food and breathe simultaneously.
- (c) The _____ is the point where a neuron makes contact with another neuron.
- (d) The knee-jerk is an example of a _____ action.
- (e) Complete the following table.

Animal	Length of gestation period (days)
Human	
	280
Sheep	
	337
Dogs	
Cats	
	22

- (f) A cow is a _____ fermentor.
- (g) A substance released from a well defined/specific organ and has a specific effect

- on some other well defined structure/function is called a _____.
- (h) The _____ apparatus is employed by insects to concentrate their urine and maximize water saving.
- (i) What gland controls the master gland? _____.
- (j) _____ is the hormone of lactation in mammals.
- (k) Two hormones from the pancreas are _____
_____.
- (l) The hormone of 'fight or flight' in mammals is _____.
- (m) Name two (2) respiratory pigments. _____
_____.
- (n) The male gamete is the _____ and the female gamete is the _____ in mammals.
- (o) What is the length of the average human menstrual cycle? _____ days.
- (p) The _____ is the organ used for mechanical digestion in birds.

[Total Marks = 25]