

UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER 2014

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. A population has the following life-history characteristics.

Age Class	Number of Survivors	Number of Deaths	Reproductive rate at beginning of interval
0-9	11	0	0
10-19	10	1	0
20-29	8	2	3
30-39	7	1	2
40-49	5	2	1
50-59	3	2	0
60-69	2	1	0
70-79	2	0	0
80-89	1	1	0
90-99	0	1	0
100+	0	0	

Copy the table below into your answer sheet and use the information above to fill in the table:

Age interval	Survivorship at beginning of age interval	Mortality rate through interval	Survival rate through interval	# of offspring / Female
0-9				
10-19				
20-29				
30-39				
40-49				
50-59				
60-69				
70-79				
80-89				
90-99				

b. Is the population increasing or decreasing? Explain your answer.

(22)  
(3)

Some useful equations

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

# of offspring per ♀ before death = Survivorship of cohort x Reproductive rate  
[Total = 25 marks]

**QUESTION 2**

a. Discuss how the following factors lead to changes in alleles frequencies in populations:

- i. Mutation
  - ii. Genetic drift
  - iii. Natural selection
  - iv. Gene flow
  - v. Non-random mating
- (15)

b. Differentiate between the following:

- i. Incomplete dominance and codominance (2)
- ii. Hydroskeleton and endoskeleton (2)
- iii. Pre-zygotic and post-zygotic barriers (3)
- iv. Genetic drift and gene flow (3)

[Total = 25 marks]

**QUESTION 3**

a. Discuss in details the main ecological interactions observed between organisms. For each interaction, explain causes of the interaction as well as impacts on the organisms involved. (15)

b. You wish to determine whether a tall pea plant is homozygous or heterozygous for tallness. What cross should you perform to arrive at your answer? Explain your choice of cross. (10)

[Total = 25 marks]

SECTION B

QUESTION 4

Make labelled sketches of the following:

- (a) A nephron (12 Marks)
  - (b) The human female reproductive system (13 Marks)
- [Total Marks = 25]

QUESTION 5

Write a brief essay on EACH of the following:

- (i) Chemical digestion (6 Marks)
  - (ii) Heterotrophic nutrition (5 Marks)
  - (iii) Peristalsis (8 Marks)
  - (iv) Sphincter muscles in the digestive tract (6 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 humans
- (iii) Female hormone of pregnancy
- (iv) Enzyme involved in fat digestion
- (v) Muscle controlling entry into the stomach
- (vi) Where sperms enter the uterus
- (vii) Hormone responsible for masculinity
- (viii) Conduction lines for impulses in the nervous system
- (ix) Number of chambers in a human heart
- (x) Feeds only on consumers

[Total Marks = 25]