

**UNIVERSITY OF SWAZILAND**

**MAIN EXAMINATION PAPER 2016**

**TITLE OF PAPER :** INTRODUCTORY ZOOLOGY

**COURSE CODE :** BIO102

**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 QUESTION 4 (COMPULSORY) PLUS ANY OTHER QUESTION.
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) Write the answer only in your booklet**

1. Name a characteristic observed in cells which indicates 'life'.
2. The \_\_\_\_\_ forms a protective veil of gases around the earth.
3. Suggest one reason why decomposition vital for life on earth?
4. Unlike solar energy, why are nutrients recycled in ecological communities?
5. Which interaction arises as a result of overlap in resource utilisation?
6. Name a strategy used by predators to maximise their predation skills.
- 7\*. What pattern of dispersion is likely to be observed in a highly territorial species of forest birds?  
Explain.
8. Alleles which in homozygous recessive condition cause death of the individual are known as \_\_\_\_\_
9. Which type of feeding can only occur in water?
10. Alternate forms of genes are known as \_\_\_\_\_
11. What is a population?
12. Harmful ultra-violet rays are screened out by the \_\_\_\_\_
13. Name the first fully terrestrial vertebrate class.
- 14\*. Name two characteristics common to all members of the Phylum Chordata
- 15\*. What is the purpose of a pre-zygotic barrier?
16. \_\_\_\_\_ results when individuals choose mates on the basis of phenotype
17. Which was the first fully terrestrial class of animals?
18. Name one characteristic common to members of the Class Mammalia.
- 19\*. Give two advantages of parental care.
20. What is meant by oviparous?
21. Name one factor which may limit the population growth rate.
22. What is a cohort?

[Total = 25 marks]

**QUESTION 2**

- a. What is dispersion? Discuss the different patterns of dispersion observed in populations, explaining why they occur. (10)
- b. A population of butterflies has the following life-history characteristics. Assume they are all females.

Age Class	Number of Survivors	Number of Deaths	Reproductive rate at beginning of interval
Egg	144000	40487	0
Instar 1	3513	987	0
Instar 2	2519	597	0
Instar 3	1922	461	0
Instar 4	1461	161	0
Imago	1300	1300	17

Copy the table below into your answer sheet and use the information above to fill in the table and indicate if the population is increasing or decreasing:

Age interval	Survivorship at beginning of age interval	Mortality rate through interval	Survival rate through interval	Reproductive rate at beginning of interval	# of offspring / female
Egg					
Instar 1					
Instar 2					
Instar 3					
Instar 4					
Imago					

(15)

**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

[Total = 25 marks]

**QUESTION 3**

- a. Both Mrs Smith and Mrs Jones had babies on the same day in a hospital. Mrs Smith took home a baby girl, whom she named Jean. Mrs Jones took home a baby girl named Susan. Mrs Jones began to suspect, however, that her child had been accidentally switched with the Smith baby in the nursery. Blood tests were made: Mr Smith was type A, Mrs Smith was type B, Mr Jones was type A and Mrs Jones was type A, Jean was type O and Susan type B. Had a mix-up occurred? Show your working and explain your answer. (10)
- b. Briefly describe and state importance of the amniotic egg. (15)

[Total = 25 marks]

**SECTION B**

**QUESTION 4.**

Write notes on the following:

- |                            |           |
|----------------------------|-----------|
| i) Lungs                   | (8 Marks) |
| ii) Functions of the liver | (8 Marks) |
| iii) Resting potential     | (5 Marks) |
| iv) Glucagon               | (4 Marks) |

[Total Marks = 25]

**QUESTION 5.**

Make labelled sketches of the following:

- |                     |            |
|---------------------|------------|
| (a) A nephron       | (10 Marks) |
| (b) The human heart | (15 Marks) |

[Total Marks = 25]

**QUESTION 6.**

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

- (i) Where insulin is manufactured
- (ii) Emulsifies fats
- (iii) Female hormone of puberty
- (iv) Organ of excretion in insects
- (v) Muscle controlling entry into the stomach
- (vi) Contraceptive that works by being a physical barrier to fertilization
- (vii) Hormone responsible for libido in male humans
- (viii) Cover for gill chamber in fish
- (ix) Number of compartments in a ruminant's stomach
- (x) Acquisition of food

[Total Marks = 25]