UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER 2017

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

Note: All questions = 1 marks except * = 2 marks; underlined = 3 marks

1. Introduction of elements into the biotic environment requires _____

2. _____ is an interaction arising due to overlap in resource utilisation by organisms.

3. Name one way by which organisms minimise predation. _____

4. Organisms which depend on fluid filled cavity for maintenance of body form and support are said to have a(n) _____ skeleton.

5. In which class is the amniotic egg first observed?

6*. Give any two factors which need to be satisfied for genetic equilibrium to be maintained.

7. Individuals of the same group living in the same habitat are known as a _____

8. Give any three factors which need to be satisfied for genetic equilibrium to be maintained.

9*.Give two reasons why Protista are economically important.

10*.What is the importance of reproductive isolation?

11. The random exchange of alleles between populations is known as _____

12. Alternate forms of a gene are referred to as _____

13*. Name two structures present only in plant cells

14. Name one consequence of global warming.

15. Each step along a feeding pathway is known as a _____ level.

16. State Mendel's law of Independent assortment.

17. Which genotype is used in test-crosses?

18. Name any two properties used in the assessment of body plans.

19. Give one way by which fish minimise friction in water?

[Total Marks = 25]

QUESTION 2

a. Differentiate between the following:

i. Fundamental and realised niche (3)

ii. Direct and indirect competition (3)

iii. Viviparity and oviparity (3)

iv. Dominant lethal and recessive lethal genes (3)

v. Exchange pool and reservoir (3)

b. How did each of the following contribute to mammalian success

i. lactation

ii. parental care (10)

[Total Marks = 25]

QUESTION 3

a. 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 × reproductive rate at 3 months × initial number of individuals

Draw a table similar to the following table 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. Define the following:

i. Community (2)

ii. Carrying capacity (3)

iii. Incomplete dominance (2)

[Total Marks = 25]

SECTION B

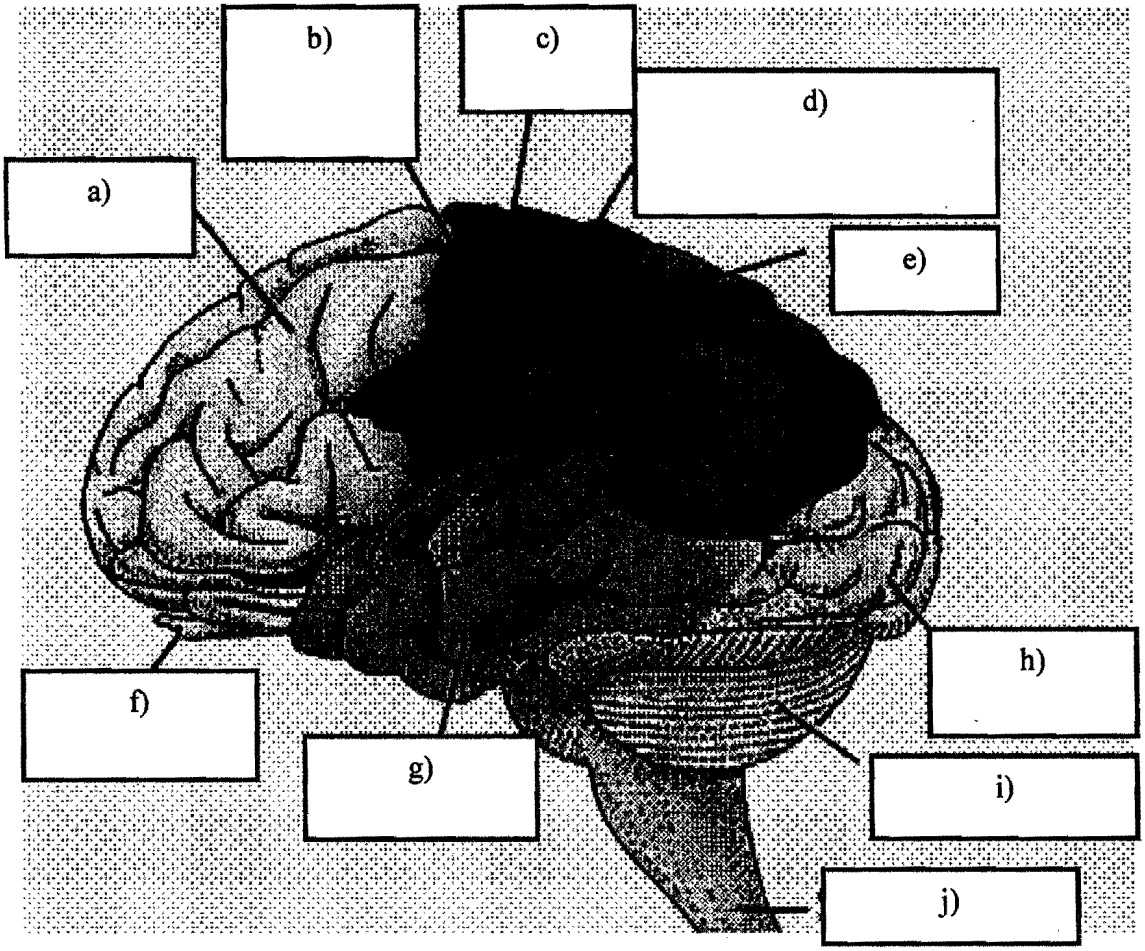
QUESTION 4

(a) What is a carnivore? _____.
(b) _____ is the number of chambers in a human heart.
(c) Acquisition of food is _____.
(d) Bubble-like structure of alveoli is maintained by means of substances called _____.
(e) _____ is the supply of substrates for energy metabolism and precursors for biosynthesis.
(f) The air sacs found in birds are grouped into _____ and _____.
(g) What artery carries deoxygenated blood?_____.
(h) The common eel (*Anguilla vulgaris*) uses _____ and _____ for gaseous exchange.
(i) Excretory organs have a role in _____ and _____.
(j) The gaseous exchange system used by insects is called the _____ system.
(k) Antennal glands are found in _____.
(l) The volume of air inhaled by humans in a single breath is called the _____.
(m) Name two (2) organs that involved in the control of respiration in terrestrial vertebrates _____ and _____.
(n) Herbivores that eat young leaves, buds, growing shoots, seeds etc. are called _____.
(o) Name the 2 types of blood vessels _____ and _____.
(p) Name the chambers found in the stomach of a ruminant _____ ,_____, _____ and _____.
(q) _____ is the expulsion of semen from the penis through the urethra.
(r) Name two female reproductive hormones are _____ and _____.
(s Name the two types of granulocytes _____ and _____.
(t) Oxygen "carriers" in blood, proteins with a metal atom are called _____.

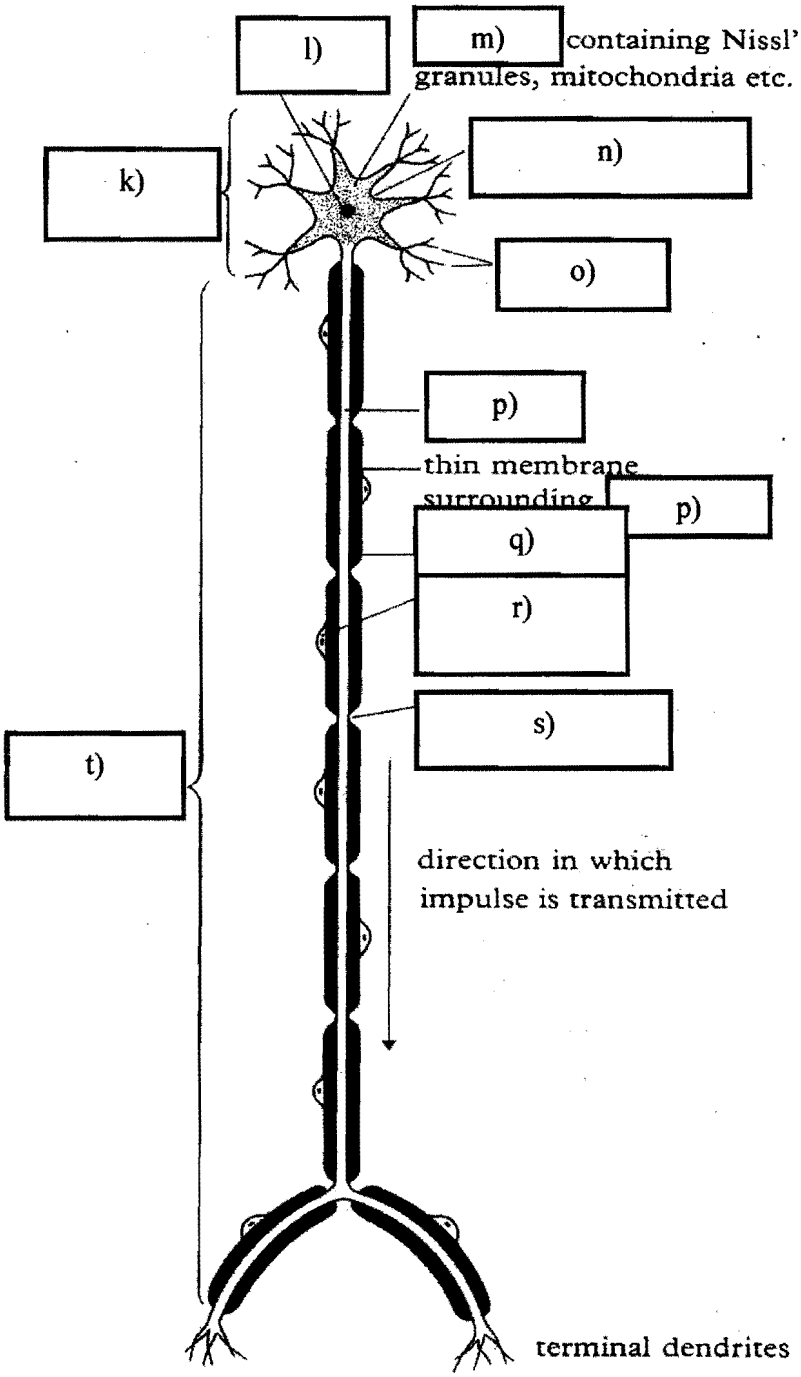
[Total Marks = 30]

QUESTION 5

Label the parts marked a) – t) in the following two diagrams. (20 Marks)



(10 Marks)



(10 Marks)
[Total Marks = 20]

QUESTION 6

a) Draw a fully labelled sketch of the human female reproductive system. (15 marks)
b) Name one human female reproductive hormone and give its function(s). (5 marks)

[Total Marks = 20]