

RWANDA NATIONAL EXAMINATIONS COUNCIL



P.O.BOX, 3817 KIGALI-TEL/FAX : 86871

017

NATIONAL EXAMINATION 2002/2003

SUBJECT : BIOLOGY III

LEVEL : TRONC COMMUN

DURATION : 3 HOURS

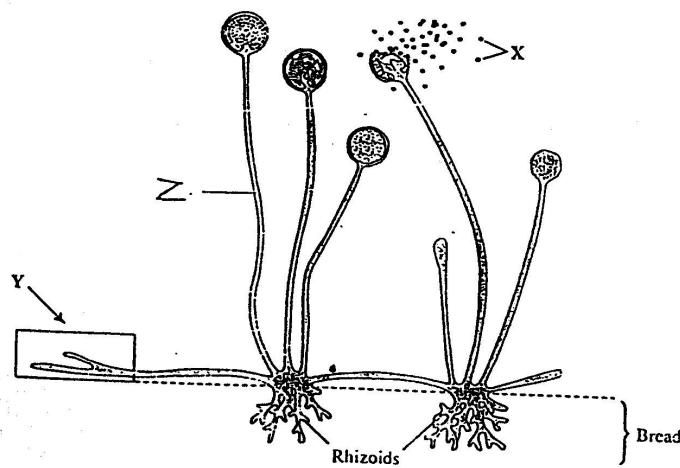
INSTRUCTIONS :

Answer **ALL** questions in Section **A**, and **THREE** questions in Section **B**. Section **C** is Compulsory.

SECTION A : /55 Marks

Answer ALL questions in this Section.

1. (a) Write AIDS in full. (1mark)
(b) What is the difference between AIDS and HIV? (2marks)
2. The diagram shows part of the structure of a fungus growing on some bread.



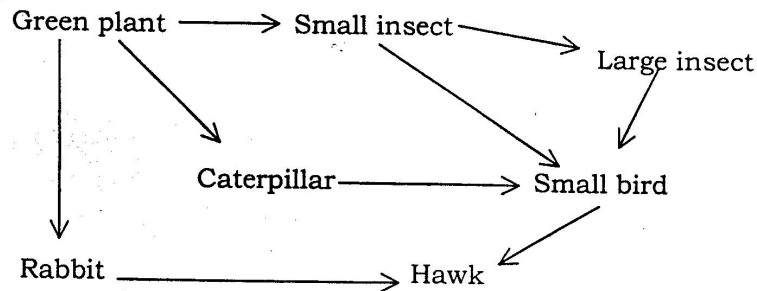
- (i) Name structures labelled X
- Z

(ii) When the fungus is feeding, the tips of hyphae labelled Y release enzymes. Explain why? (2marks)

3. Give differences between a butterfly and a moth. (3marks)
4. What are main stages of incomplete metamorphosis? (3marks)
5. Give at least three functions of blood. (3marks)
- 6.(a) Sportsmen are normally given glucose and not sucrose after exercise. Explain why? (2marks)
- (b) What are products of glucose oxidation. (1½marks)

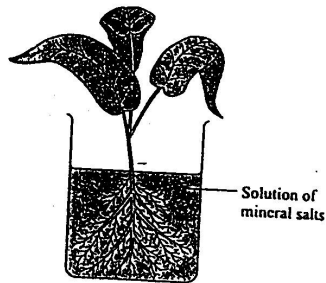
7. (a) Describe three ways in which plant cells are different from animal cells. **(1½marks)**
- (b) Name structures that are common to both animal and plant cells. **(3marks)**
8. Name excretory organs and their respective waste products. **(4marks)**
9. What are functions of the skin ? **(3marks)**
10. Which hormones are produced by the pancreas gland ?
What is the function of these hormones ? **(4marks)**
11. (a) What is the initial organism in any food chain ?
Explain your answer. **(2marks)**

(b) Study the food web below.



- (i) Which organisms are (i) Primary consumer
(ii) Secondary consumer
- (ii) What would happen if small Insects died ? **(2marks)**

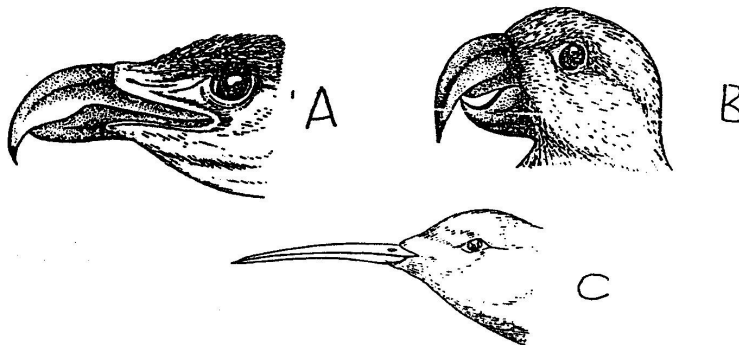
12. Plants need water which often has mineral salts dissolved in it



- (a) What do plants make from the following minerals ?
- (i) Nitrates (2marks)
 - (ii) Magnesium (2marks)
- (b) Give two reasons why water is important to plants. (2marks)
- (c) (i) In which vessels does water travel up through the plant ? (1mark)
- (ii) In which vessel does sugar travel through the plant ? (1mark)

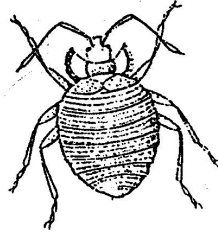
13. What are main classes of phylum Arthropoda? (3marks)

14. Study the beaks of birds below.



Suggest the feeding habits of these birds.
Explain your answer. (3marks)

15. The organism below belongs to class insect. Suggest reasons why?



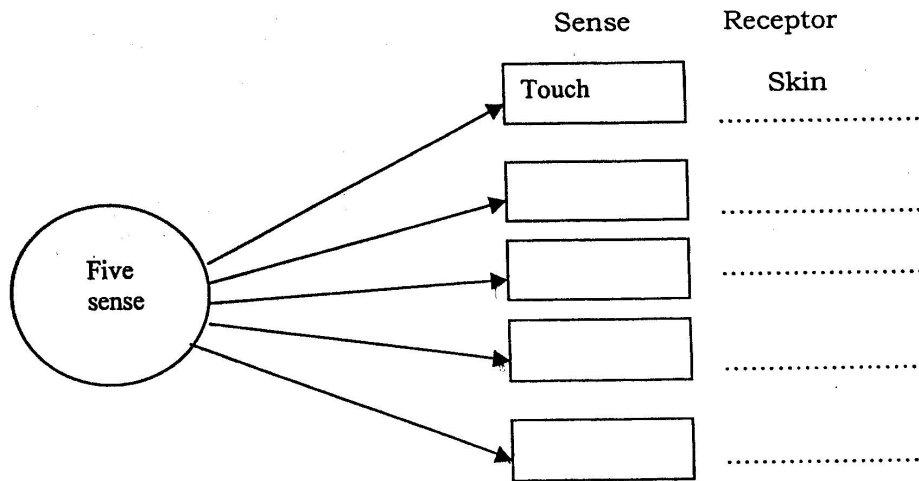
Suggest reasons why?

(3marks)

SECTION B : /30 Marks

Answer only THREE questions in this Section.

16. (a) Humans have a number of senses, for example touch, senses are detected by receptors for example skin detects touch. In the box below write the names of other senses. By each box write the name of the receptor.



(8marks)

(b) When your hand is touched, the information is passed to your brain. Describe how the information gets from your skin to your brain.

(2marks)

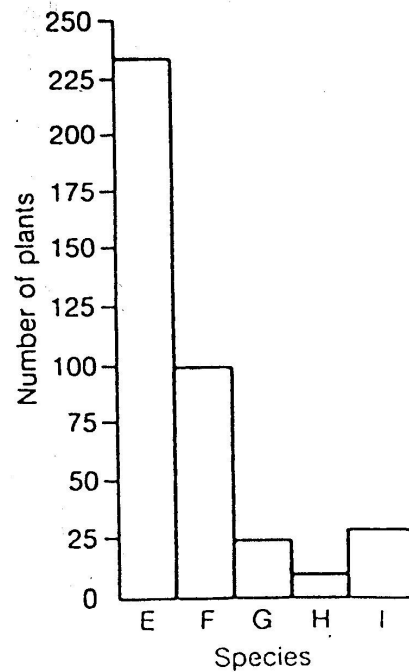
17. (a) Name the organs in which mitosis occurs in mammals and flowering plants. **(2marks)**
- (b) What is the importance of mitosis in living organisms. **(2marks)**
- (c) In a breeding experiment with garden peas, a sample of plants with white flowers and breed true was crossed with a sample of plants which produce red flowers and breed true. When the seeds produced were grown all the resulting F₁ generation produced red flowers.
- (i) Why were no white flowers produced by plants belonging to the F₁ generation. **(2marks)**
- (ii) Using genetic symbols, explain what would result from interbreeding the F₁ generation. **(4marks)**
18. (a) What is an enzyme ?
- (b) Describe the characteristics of enzyme ?
- (c) What part is played by enzymes in the germination of maize ? **(10marks)**
19. (a) Give examples of Micro-organisms. **(2marks)**
- (b) Describe the importance of micro-organisms to man. **(8marks)**
20. Malaria is a killer disease in Africa especially South of the Sahara.
- (i) What causes Malaria. **(2marks)**
- (ii) Suggest possible methods you would use to eradicate Malaria in your village. **(5marks)**
- (iii) What steps has the government of Rwanda taken to reduce the infection of Malaria ? **(3marks)**

SECTION C : /15 Marks

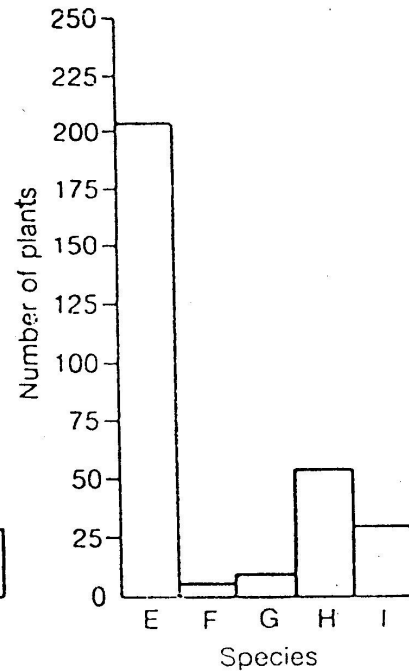
This Section is Compulsory.

21. (a) A group of students studied two areas of grassland. One lightly trampled and the other heavily trampled. The histograms below show the numbers of plants of five different species found in random samples taken within each region.

**Histogram 1
Lightly Trampled Region**



**Histogram 2
Heavily Trampled Region**



- (i) How many of species E were found in each region? **(2marks)**
- (ii) What is the effect of increased trampling on species G and H? **(2marks)**
- (iii) Which species are most affected by trampling? **(2marks)**
- (iv) Which species are least affected by trampling? **(2marks)**

(b) The following organisms were found on abandoned farm.

- Green plants
- Hawks
- Lizards
- Grasshoppers and
- Snakes

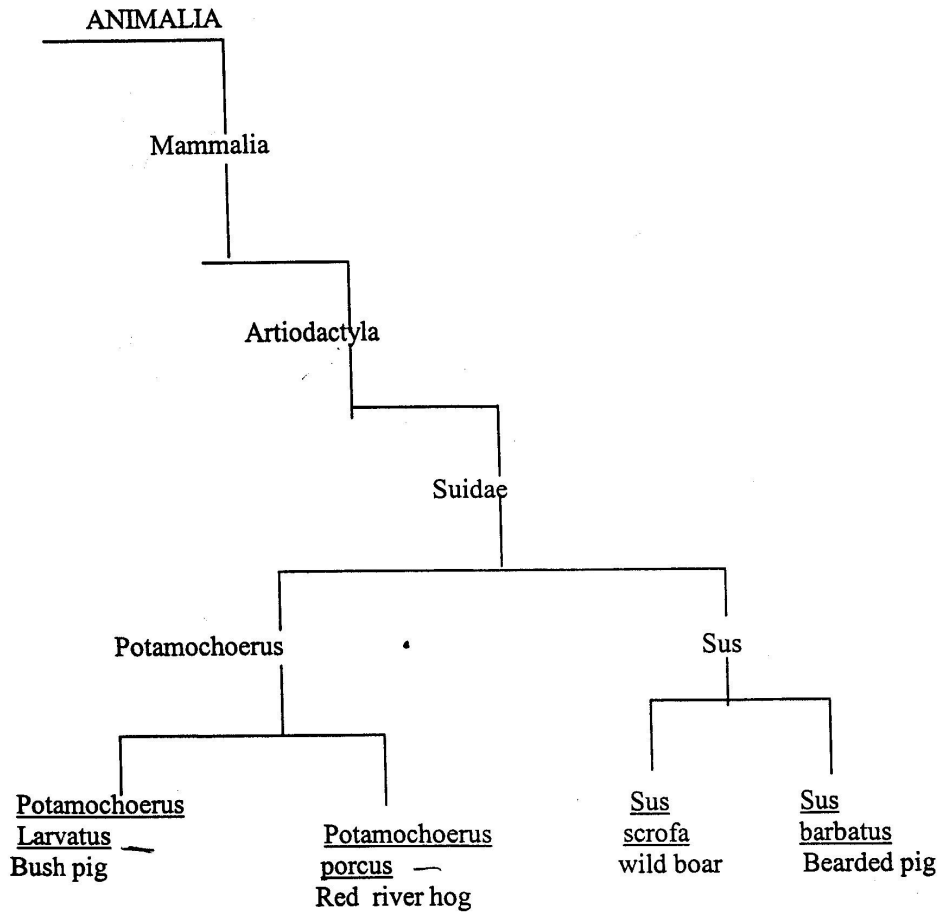
(i) Construct a pyramid of numbers to show their relationship. **(4marks)**

(ii) Which organism(s) are:

- Tertiary consumers
- Top Carnivores
- Herbivores

(3marks)

The diagram shows how four species of pig are classified .



To which class do these pigs belong ? (1 mark)

To which family does the red river hog belong ? (1 mark)

To which genus does the bearded pig belong ? (1 mark)

Give the species name of Bush pig . (1 mark)