

**RWANDA NATIONAL EXAMINATIONS COUNCIL**

**017**



**PO BOX 3817 KIGALI.- TEL/FAX 86871**

**NATIONAL EXAMINATION 2001/2002**

**SUBJECT : BIOLOGY III**

**LEVEL : TRONC COMMUN**

**TIME : 3 HOURS**

**INSTRUCTIONS :**

- Answer all questions in A and THREE questions in section B.
- Section C is compulsory.

**SECTION A (55 MARKS)**

Answer all questions in this section

- 1.** What materials must be supplied to cells if they are to survive ? (2 marks)
- 2.** What features are (a) possessed by both plants and animals ? (2 marks)  
(b) possessed by plants only ? (2 marks)
- 3.** A motor car can move, takes in oxygen and gives out carbon dioxide, consumes fuel but nevertheless is not a living organism. In what ways does it not qualify as a living organism (2 marks)
- 4.** How do roots and leaves obtain oxygen for respiration? (2 marks)
- 5.** a) Where does respiration occur ? (1 mark)  
b) What is the importance of respiration? (1 mark)  
c) What are products of respiration? (1 mark)
- 6. a)** Draw a line to link the name of the life process with its meaning.  
One is done for you.

Life process	Meaning
Reproduction	changing the position of a part or all of the body.
Growth	Responding to the environment
Movement	Producing fertile off springs
Sensitivity	Getting larger or more developed

(3 marks)

- b) The following are parts of an organism.  
 Cell, organ, chromosome, system, gene, tissue.

Arrange them in decreasing order of size

Largest

↓

Smallest

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

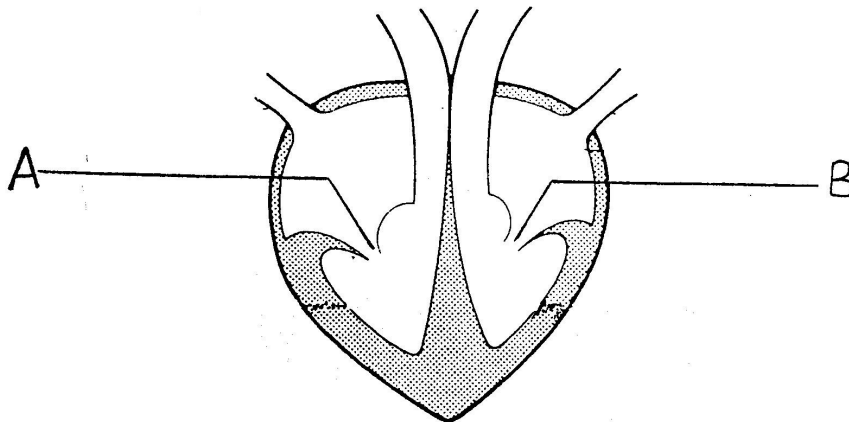
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(3marks)

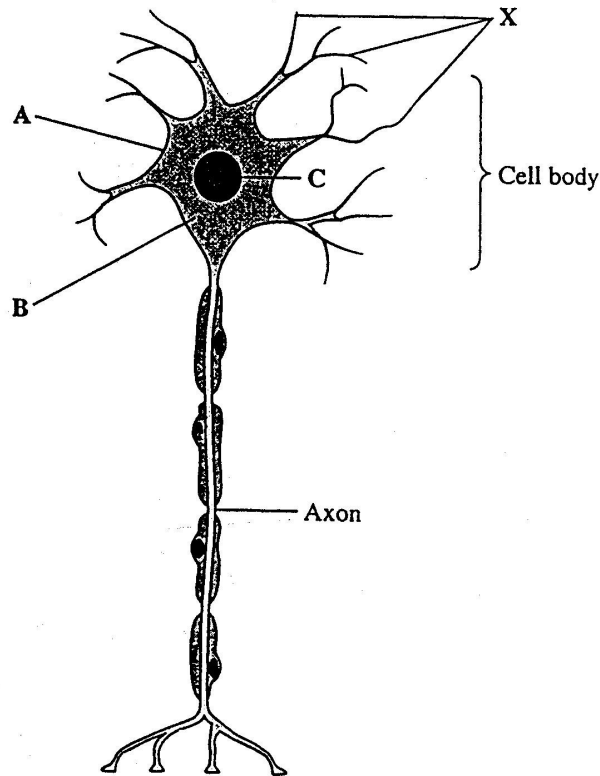
- 7) In what ways does a dicotyledonous leaf adapt itself to its function? (2 marks)
- 8) What are requirements for photosynthesis? How are the requirements met in a land plant? (3 marks)
- 9) What is the importance of bacteria to man? (2 marks)
- 10) The diagram represents the structure of the heart



- a) Use arrow to indicate the direction of blood flow through the heart (1 mark)
- b) What are functions of A and B? (2 marks)

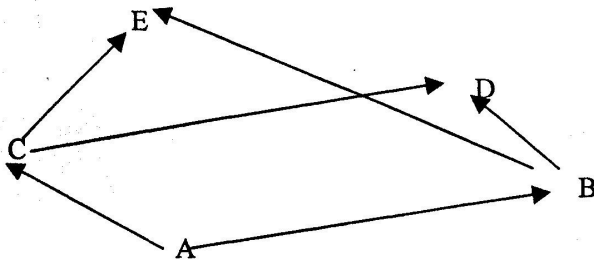
c) Why do ventricles have thicker muscular walls than atria? (2 marks)

11) The diagram shows a motor neurone ( a nerve cell)



- a) Name structures A, B and C (3 marks)
- b) Suggest the function of X (1 mark)
- c) Draw an arrow on the diagram to show the direction of a nerve impulse (1 mark)

12. The diagram below shows a simple food web



- a) Use the diagram to name
  - (i) Herbivore
  - (ii) An omnivore
  - (iii) A producer(3 marks)

- b) (i) The animals in the food web get their energy from the food they eat. From where do A's get their energy. **(1 mark)**  
 (ii) Draw a pyramid of energy for the following food chain

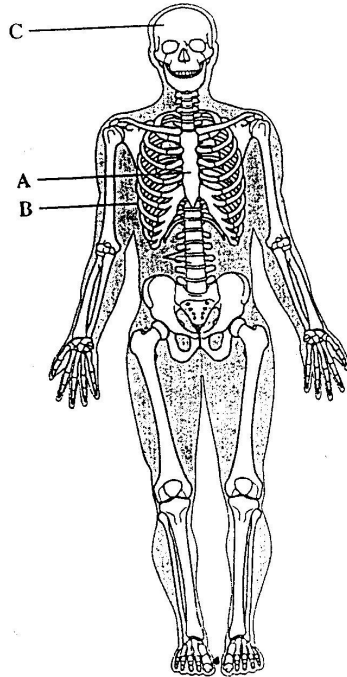


- 13) The chromosome for determining the gender or sex of a person are labelled X and Y

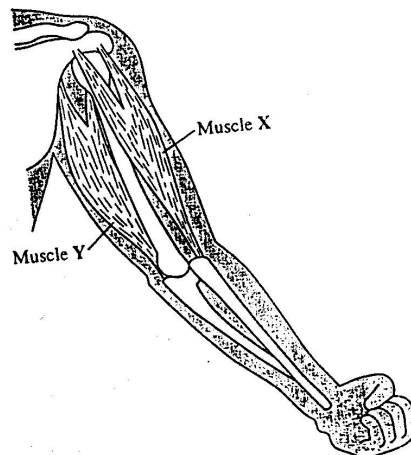
	(X) PARENT 1 (x)
(X) PARENT 2	—
( )	—

- a) Complete the punnett square to show the genotype of parent 2 and of the four offsprings. **(3 marks)**  
 b) Which parent is the mother? **(1 mark)**  
 c) What are the chances of getting a baby boy? **(1 mark)**

14. a. The drawing below shows the human skeleton. Humans have a bony endoskeleton



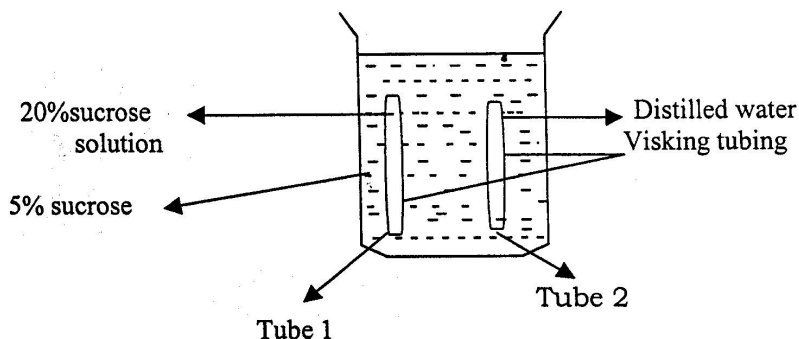
- i) Name the structures labelled A and B. (2 marks)  
ii) What is function of C? (1 marks)
- b) Give the name of one animal which has an exoskeleton. (1 mark)
- c) The drawing shows the bones and some of the muscles in human arm.



- i) Describe what will happen to the arm when muscle X contracts (2 marks)
- ii) What is the function of muscle Y (2 marks)

**SECTION B (30 MARKS)**

- 15. a) Name any one disease caused by bacteria. (1 mark)
- b) How can you prevent the spread of this disease you have named to infect other people. (9 marks)
- 16. Give differences between vegetative and sexual reproduction. (10 marks)
- 17. a) What are digestion, absorption, assimilation, and egestion (4 marks)
- b) Where does each of these functions take place in the body? (4 marks)
- c) Why must food be digested before the body can use it? (2 marks)
- 18. Some student set up this experiment to investigate osmosis. They filled two pieces of dialysis (Visking tubing) with different liquids and left them both in a beaker of 5% sucrose solution for one hours.



- a) Describe and explain the likely result after one hour. (5 marks)
- b) Describe two examples where osmosis is used in living things. (5 marks)
- 19. a) Photosynthesis is a process that take place in green leaves.
  - i) What type of energy is needed for this process? (1 mark)
  - ii) What substance (s) in the plant that absorbs this energy? (1 mark)
  - iii) In which part of the plant cell does photosynthesis take place? (1 mark)
  - iv) Write the chemical equation for photosynthesis? (3 marks)

b) Describe two ways you would use to speed up photosynthesis.

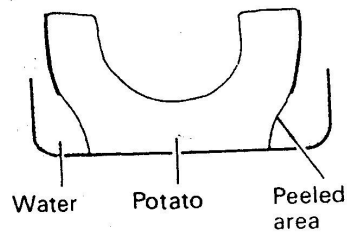
(4 marks)

**SECTION C (15 MARKS)**

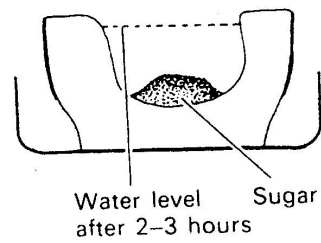
This section is compulsory.

20. a) The students performed the experiment illustrated below .

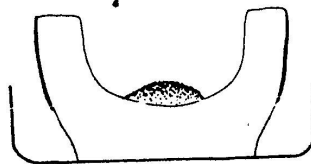
**A Empty potato cup**



**B Potato cup with sugar**



**C Boiled potato cup with sugar**



- i) Explain in details why water gathers in the hollowed portion of potato B (5 marks)
- ii) Explain why water does not gather in the hollowed portion of potato A and C. (5 marks)
- iii) Why is potato A necessary in this experiment? (1 mark)