



MARANDA HIGH SCHOOL

Kenya Certificate of Secondary Education MOCK EXAMINATIONS 2021

CODE: 231/2

SUBJECT: BIOLOGY

Paper 2

December 2021 - TIME: 2 Hours

Name: **Adm No:**

Class: **Candidate's Signature:** **Date:**/12/2021.

INSTRUCTIONS TO CANDIDATES

1. Answer **all** the questions.
2. Answers **must** be written in the spaces provided in the question paper.
3. Additional pages **must not** be inserted.
4. Candidates may be penalized for recording irrelevant information and for incorrect spellings.

○ **FOR EXAMINER'S USE ONLY**

Section	Question	Maximum Score	Candidate's Score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
	6	8	
B	7	20	
	8	20	
Total Score			

SECTION A (40 marks)

1. Form three students were required to study the population of crabs in a pond.

- a) List **two** apparatus that the students would need for the investigation. (2 marks)

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- b) State the method of sampling used and give a reason for your answer. (2 marks)

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- c) What precautions should the class take when performing this investigation? (2 marks)

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- d) Identify **two** ways you would use to determine what the crabs in the pond feed on.

(2 marks)

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2. In an experiment to investigate a physiological process in onion cells a thin epithelium of onion bulb leaf was placed on a glass slide and drops of concentrated salt solution added. After 3 minutes the cells were observed under medium power objective lens of a light microscope.

- (a) (i) Draw a labeled diagram showing how **one** of the cells will appear.

(2 marks)

(ii) Account for the observation made in a (i) above. (3marks)

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(iii) Name the process that occurred in the cell in a (i) above. (1mark)

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iv) Describe what would happen to a red blood cell if placed in similar condition. (2marks)

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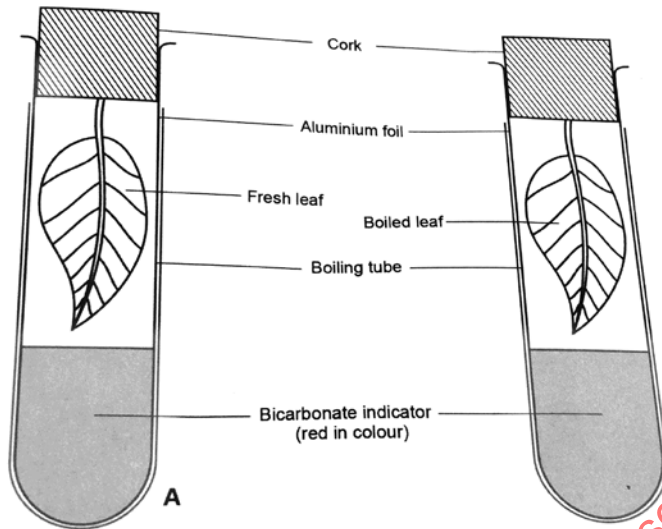
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3. The below set ups were used to investigate gaseous exchange. Study them and answer the questions that follow.



- a) State the expected result in boiling tube B.

(1 mark)

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- b) State and account for the result obtained in boiling tube A.

(3 marks)

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c) Describe the mechanism of inhalation in a human being. (4 marks)

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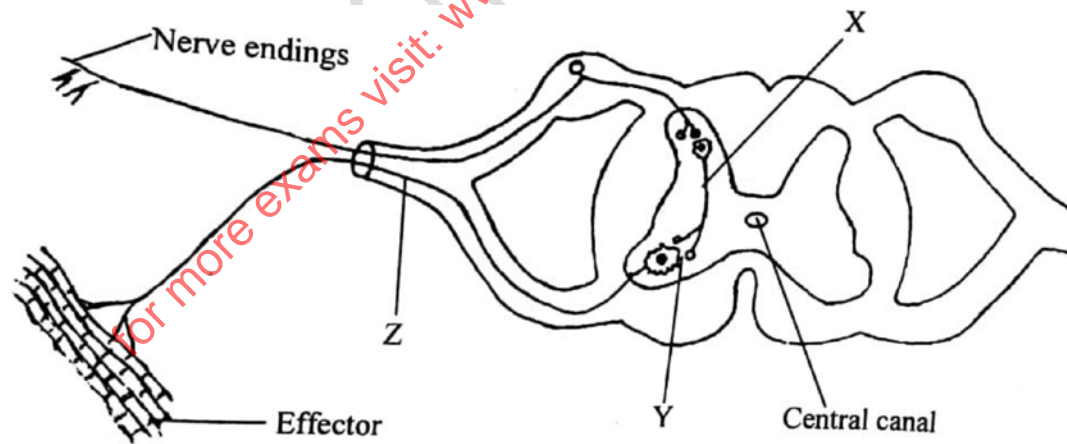
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4. The diagram below represents a simple reflex arc in human.



(i) Name the neurone labeled X.

(1 mark)

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(ii) Explain how a nerve impulse is bridged across the gap Y (3 marks)

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iii) A person had a car accident that damaged one part of his brain but left the rest of it unaffected. Complete column B of the table below by filling in the part of the brain whose damage would correspond to the symptom shown in column A. (4 marks)

A	B
Inability to regulate body temperature	
Loss of memory	
Irregular heart beat and breathing movements	
Inability to maintain proper body balance and posture	

5. a) A man of blood group B marries a woman of blood group A. Both of whom are heterozygous of these genes. Work out the possible blood group of their children. (4 marks)

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- b) i) Which of these blood groups show co-dominance? (1mark)

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- ii) Give the name used to describe the inheritance of the ABO blood groups. (1 mark)

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- c) Define the following terms; (2 marks)

- i) Test cross

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ii) Allele

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SECTION B (40 Marks)

6. Ten young rats were placed in a cage. The amount of food available to the mice each day was kept constant. Their number changed over time as shown in the table below.

Time in months	0	2	4	6	8	10	12	14	16	18
Number of rats	10	10	55	105	300	445	440	180	135	150

a) Using a suitable scale, plot a graph of number of rats against time.

(6 marks)



b) With reference to the graph, account for the change in rat population between

i) 0 to 2 months (2 marks)

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ii) 2 to 10 months (2 marks)

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iii) 10 to 16 months (2 marks)

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iv) 12 to 16 months

(2 marks)

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c) i) Between which two months was the population change greatest.

(1 mark)

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ii) Calculate the rate of population change over the period you have stated in c i) above.

(2 marks)

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- d) Briefly describe a suitable sampling method you would use to estimate the population of grasshoppers in a school garden. (3marks)

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7. a) State three reasons why transport is necessary in animals (3 marks)
- b) Describe how the mammalian heart is adapted to its function. (17 marks)
8. a) Describe the importance of locomotion in animals (4 marks)
- b) Describe the adaptations of a finned fish to locomotion in water. (16 marks)

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