



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			

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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)



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)

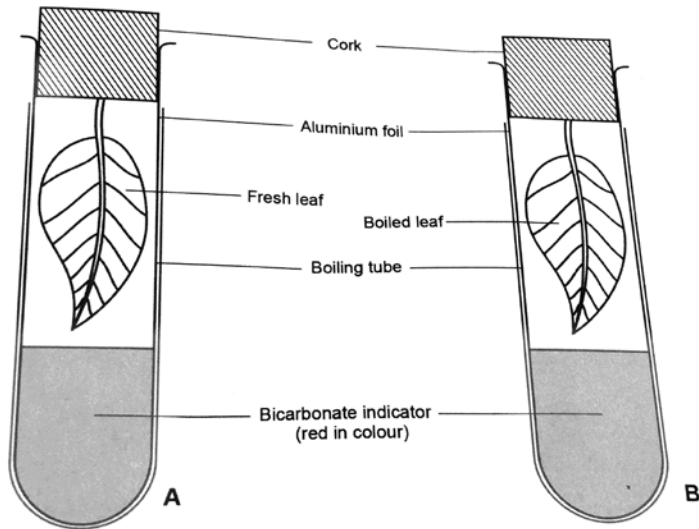
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iv) Describe what would happen to a red blood cell if placed in similar condition. (2marks)



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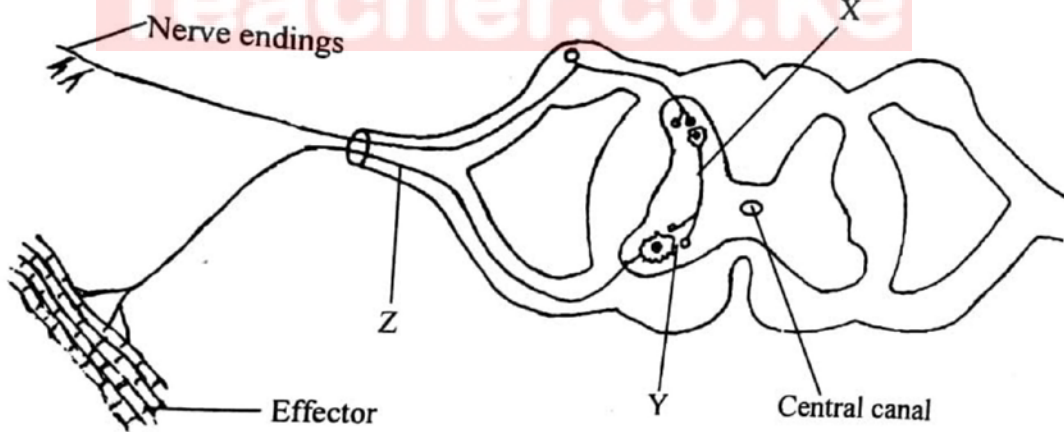
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4. The diagram below represents a simple reflex arc in human.



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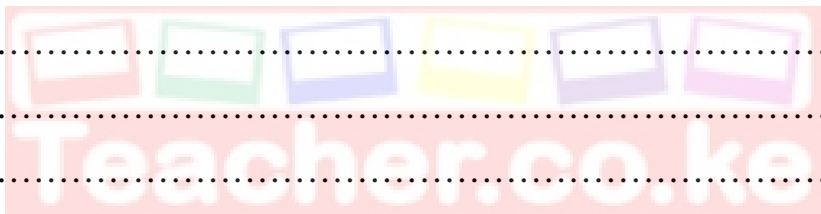
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c) i) Between which two months was the population change greatest.

(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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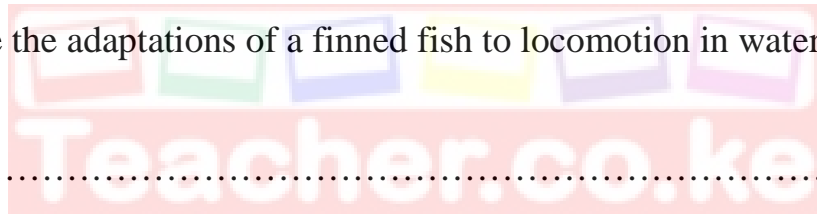
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7. a) State three reasons why transport is necessary in animals (3 marks)

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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