NAME…………………………………………………………….... INDEX NO……........…..……………

CANDIDATE'S SIGNATURE…………………...

DATE………..……………………………..............

231/2
BIOLOGY (THEORY)
PAPER 2
JULY/AUGUST 2011
TIME: 2 HRS.

NANDI SOUTH, NANDI EAST AND TINDIRET DISTRICTS JOINT EXAMINATION 2011

Kenya Certificate of Secondary Education
BIOLOGY PAPER 2 (THEORY)
TIME: 2 HRS.

INSTRUCTIONS TO CANDIDATES:

Write your **Name** and **Index Number** in the spaces provided above.
This paper consist of Section **A** and **B**.
Answer **ALL** the question in Section **A** in this spaces provided.
In Section **B** answer question **6 (Compulsory)** and either questions **7** or **8** in the spaces provided after question **8**.

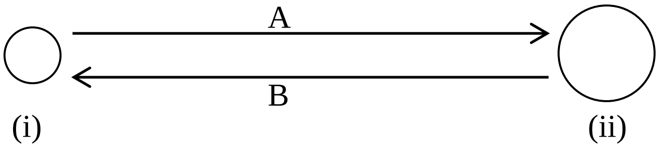
FOR EXAMINER'S USE ONLY:

Section	Question	Maximum Score	Candidate's Score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
Total Score		80	

SECTION A: (40 MARKS)

Answer all the questions in this section in the spaces provided.

1. The diagrams below represents two states of blood vessels in the human skin under two different environmental conditions.



(a) Identify process **A** and **B**. (2mks)

A ____

B ____

(b) What environmental conditions would make the vessel to be in the state (i). (1mk)

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(c) Under certain conditions, carbon IV oxide concentration in the blood of mammals rises above normal levels. State **two** physiological changes that occur to bring carbon IV oxide level back to normal. (2mks)

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(d) Why does a fresh wound bleed more in hot weather that in cold weather. (1mk)

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(e) A certain organ **K** was surgically removed from a rat. Later a drastic increase in glucose level was observed in the blood, substance **Q** was injected into the animals blood. The whole process reversed.
Identify.

(i) Organ **K** ________________________________ (1mk)

(ii) Substance **Q** ________________________________ (1mk)

2. (a) In a certain family with three children, one child is blood group AB, while the other is blood group 0. Using a punnet square work out the genotypes of the two children if the mother is blood group B and the father is blood group A. (3mks)

(b) Define the terms:

(i) Multiple alleles. (1mk)

(ii) Gene locus. (1mk)

(c) State the significance of test crossing in the study of genetics. (1mk)

(d) Give the importance of crossing over. (1mk)

3. (a) What is the importance of reproduction in living organisms. (2mks)

(b) (i) At what stage of mitosis do chromosomes replicate to form daughter chromatids. (1mk)

(ii) State **three** difference between mitosis and meiosis. (3mks)

(c) Give **two** ways in which flowers prevent self pollination. (2mks)

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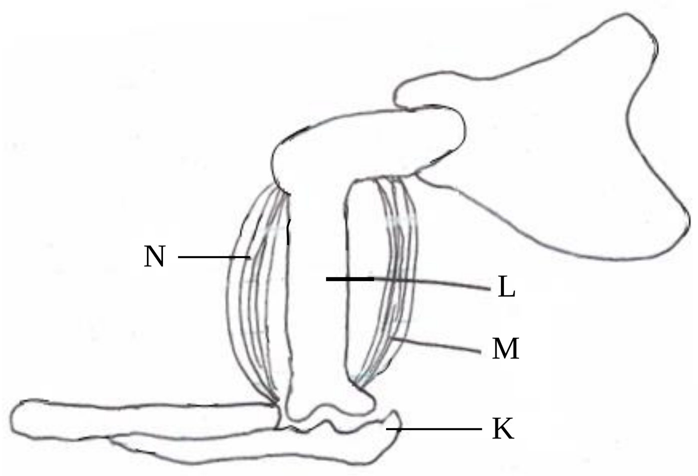
4. The diagram below shows the arrangements of bones and the muscles in human arm.



(a) Name the parts labelled **K** and **L**. (2mks)

K ____

L ____

(b) State **three** structural differences between the structure labelled **N** and muscles of the gut. (3mks)

	N	Gut muscles
(i)		
(ii)		
(iii)		

(c) State how skeletal muscle fibres are adapted to their functions. (2mks)

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(d) Which is the main feature that differentiates the axis from the other cervical vertebrae. (1mks)

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5. (a) State **three** roles of water to the human body. (3mks)

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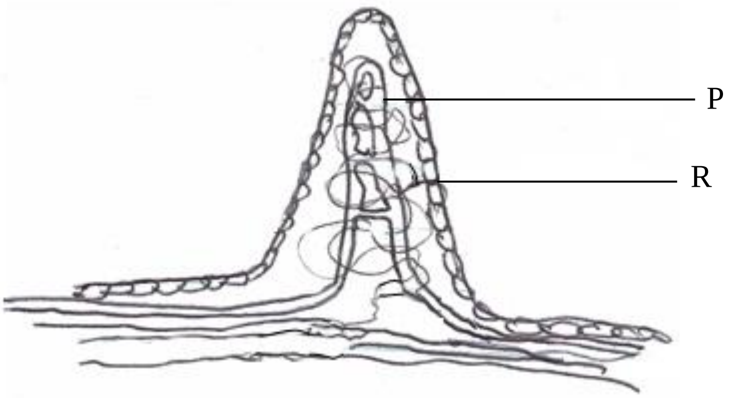
(b) The diagram below represents a section of the small intestines.



(i) Name the parts labelled:

P ______________________________________ (1mk)

R ______________________________________ (1mk)

(c) Name the disease associated with lack of vitamin C. (1mk)

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(d) Give any **two** practices that ensure the teeth remain healthy. (2mks)

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SECTION B: (40 MARKS)

Answer question **6 (Compulsory)** and either question **7** or **8** in the spaces provided after question **8**.

6. The data below shows the change in average height and dry mass of the stem of an annual leguminous plant. The data was taken between the 1st and the 14th week after planting.

Week	Height (cm)	Mass (g)
1	6	7
2	16	18
3	31	37
4	48	60
5	61	94
6	71	145
7	79	190
8	86	225
9	91	250
10	94	270
11	96	285
12	96	305
13	96	305
14	96	285

(a) Plot the graphs of height and mass against time on the same axis. (7mks)

GRAPH

(b) During which two weeks did the largest increase in mass occur. (1mk)

(c) Calculate the average growth rate (in g) during the two weeks you have mentioned in (b) above. (2mks)

(d) Between 11th and 13th week, average height of the plants remained the same but mass increased. Suggest an explanation for this observation. (2mks)

(e) Suggest an explanation to account for the decrease in mass after the 13th week. (1mk)

(f) Why is it necessary to use dry mass instead of fresh mass. (2mks)

(g) Why was it necessary to carry out both dry mass and height measurements. (1mk)

(h) Explain how you can measure the growth of one leaf. (4mks)

7. Explain how various activities of man have caused pollution of air. (2mks)

8. How is the human eye adapted to performing its functions. (20mks)