Name.. Index No ....

School.. Candidates Signature…………..………

Date: ………………….…...…………….

231/2
BIOLOGY PAPER
Paper 2(Theory)
July / August 2011
Time: 2 Hours

MASINGA DISTRICT JOINT EVALUATION TEST - 2011
Kenya Certificate of Secondary Education (K.C.S.E)

BIOLOGY
Paper 2
(Theory)
Time: 2 Hours

Instructions to candidates

- Answer **all** questions in section A by filling in the spaces provided.
- In Section B, Answer Question 6 (Compulsory Question) and any other One Question from the remaining two Questions.
  (i.e. 7 or 8)

FOR EXAMINER'S USE ONLY

Section	Question	Maximum score	Candidates score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
	Total Score	80	

This paper consists of 8 printed pages.
Candidates should check to ensure that all pages are printed as indicated and no questions are missing

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SECTION A   (40 MARKS)
Answer __ALL__ questions in this section in the space provided below.

1. (a) What is meant by the term sex linkage?   (1 Mark)

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(b) Name two sex-linked traits in humans.   (2 Marks)

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(c) In __Drosphilamelanogaster__, the inheritance of eye color is sex-linked. The gene for the red eye is dominant. A cross was made between a homozygous red-eyed female and a white eyed male. Work out the phenotypic ratio of F1 generation.   (5 Marks)

(Use R to represent the gene for red eyes).

2. A response exhibited by a certain plant tendril is illustrated below.

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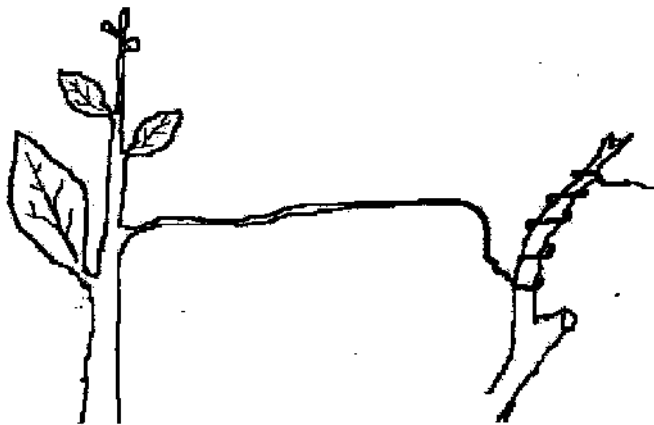
a) (i) Name the type of response. (1 Mark)

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(ii) Explain how the response named in a (i) above occurs. (3 Marks)

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b) What is the importance of tactic response to microscopic plants? (1 Mark)

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c) State **three** applications of plant hormones in Agriculture. (3 Marks)

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3. The diagram below shows how gaseous exchange occurs across the gills in fish.
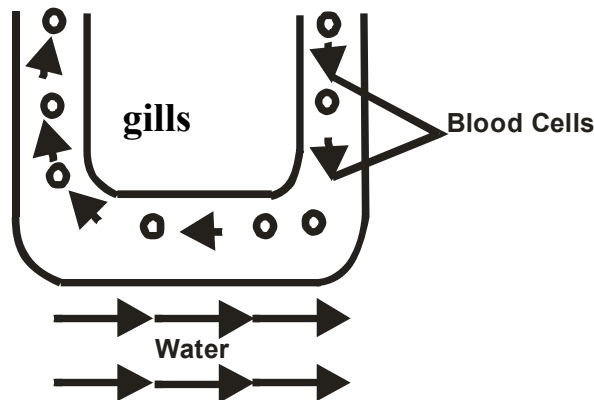
(a) According to the diagram water and blood flow in opposite direction across the gills.

(i) Give the term used to describe this flow. (1 Mark)

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(ii) Explain the advantage of the above flow named in a(i) above. (2 Marks)

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(b) What difference would be observed if water and blood flows across the gills in the same

direction? (2 Marks)

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(c) In which structures in the gills does gaseous exchange take place? (1 Mark)

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(d) Name **two** organs in man which display the flow system named in a(i). (2 Marks)

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4. An experiment was carried out to investigate the effect of different concentrations of Sodium Chloride on human red blood cells. Equal volumes of blood were added to equal volumes of salt solutions of different concentrations. The results were as shown below:-

Set up	Sodium Chloride concentration	Shape of red blood cells at the end of experiment	Number of red blood cells at the end of experiment
A	0.9%	Normal	No change in number
B	0.3%	Swollen	Fewer in number

a) If the experiment was repeated with 1.4% Sodium Chloride solution, state the results you would expect with reference to:-

(i) Number of red blood cells. (1 Mark)

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(ii) Appearance of red blood cells when viewed under the microscope. (1 Mark)

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b) Account for the fewer number of red blood cells in 0.3% Sodium Chloride salt solution. (3 Marks)

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c) Give the biological term which can be used to describe 0.9% Sodium chloride solution.

(1 Mark)

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d) Define plasmolysis. (1 Mark)

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5.   To estimate the population size of crabs in a certain lagoon, traps were laid at random. 400 crabs were caught marked and release back into the lagoon. Four days later traps were laid again and 374 crabs were caught out of the 374 crabs, 80 were found to have been marked.

a)   Calculate the population size of the crabs in the lagoon using the formula below.   (2 Marks)

$$N = \ \frac{}{}$$

Where N = total population of crabs in the lagoon

n = total number of crabs in the first catch

M = number of crabs in the second catch

m = number of marked crabs in the second catch

b) State **two** assumptions that were made during the investigations.   (2 Marks)

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c) What is the name given to this method of estimating the population size?   (1 Mark)

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d) State **one** precaution to be taken when carrying out this method of estimating population size.

(1 Mark)

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e) Give **two** other methods used in estimating population size.   (2 Marks)

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SECTION B (40MARKS)

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

6. A hungry person had a meal, after the concentration of glucose and amino acids in the blood were determined. This was measured hourly as the blood passed through the hepatic portal vein and the iliac vein in the leg. The results were as shown in the table below.

Time (hrs)	Concentration of contents in the hepatic portal vein (mg / 100ml)		Concentration of contents in the iliac vein (mg / 100ml)	
	Glucose	Amino acids	Glucose	Amino acids
0	85	1.0	85	1.0
1	85	1.0	85	1.0
2	140	1.0	125	1.0
3	130	1.5	110	1.5
4	110	1.5	90\	3.0
5	90	3.0	90	2.0
6	90	2.0	90	1.0
7	90	1.0	90	1.0

a) Using the same axis, draw graphs of concentration of glucose in the hepatic portal vein and the iliac vein of the leg against time.   (7 Marks)

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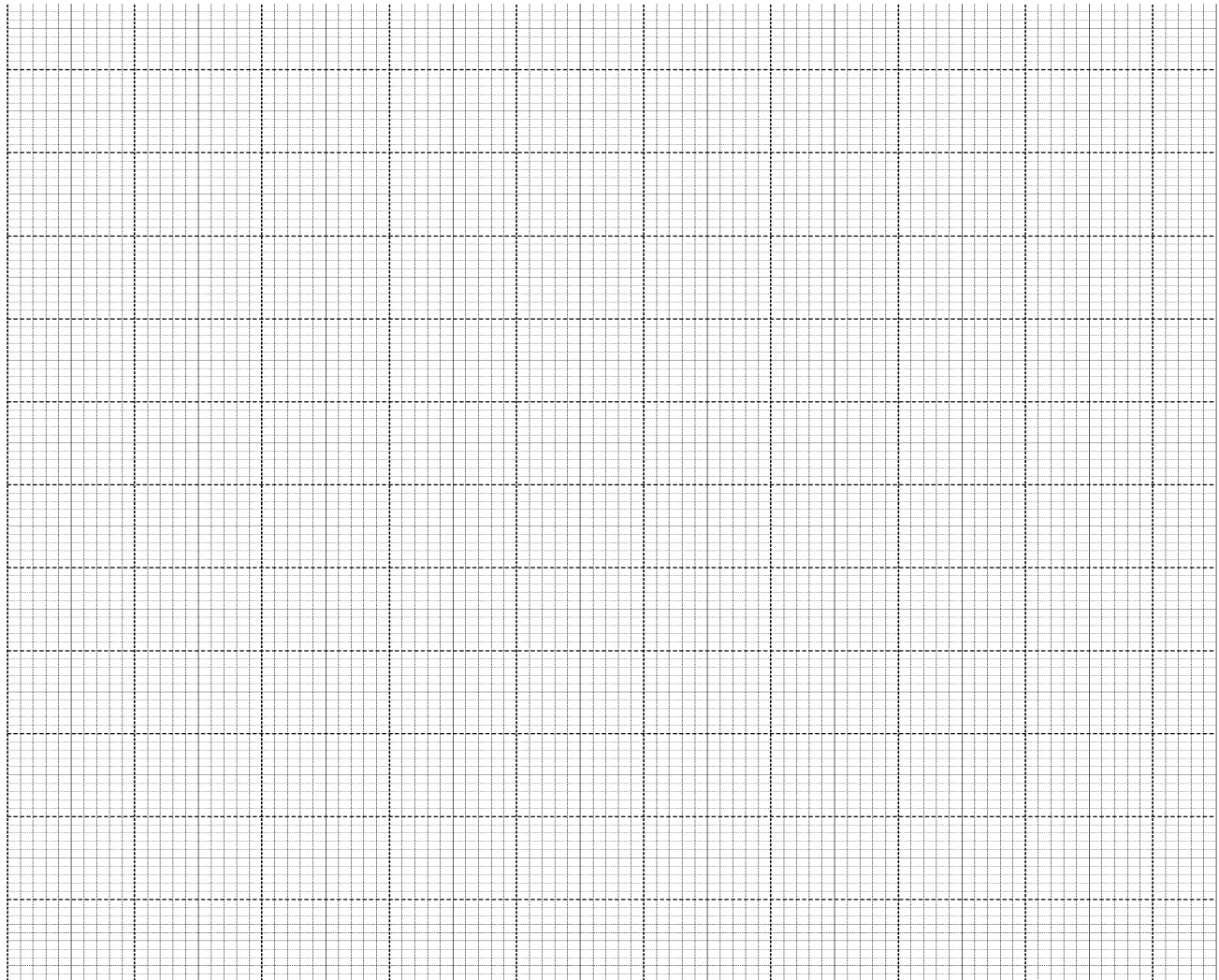
b) Account for the concentration of glucose in the hepatic portal vein from;

i) 0 - 1hr (2Marks)

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ii) 1 - 2hrs (3Marks)

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iii) 2 - 4hrs (2 Marks)

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iv) 5 - 7 hrs (2 Marks)

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c)   Account for the difference in concentration of glucose in hepatic portal vein and the iliac vein
between 2 and 4 hrs. (3 Marks)

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d)   Using the data provided in the table, explain why the concentration of amino acids in the
hepatic portal vein took longer to increase. (1 Mark)

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7. a) Explain the roles of the mammalian placenta. (7 Marks)

   b) Describe how hormones regulate the menstrual cycle in human females. (13 Marks)

8. Describe causes and methods of controlling water pollution. (20 Marks)

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