NAME ..... INDEX NUMBER .....

SIGNATURE .....

DATE .....

231/2
BIOLOGY
PAPER 2
TIME: 2 HRS
JULY/AUGUST 2014

WESTLANDS FORM 4 JOINT EXAMINATION

Kenya Certificate of Secondary Education

BIOLOGY

Paper 2 (Theory)
July/August 2014
Time: 2 hours

INSTRUCTIONS TO CANDIDATES

a) Write your **name** and **index** number in the spaces provided at the top of this page.

b) **Sign** and write the **date** of examination in the spaces provided above.

c) There are **eight (8)** printed pages. Ensure that **ALL** pages are printed.

d) Answer all questions in section A in the spaces provided and **question 6** (compulsory) in section B and either question 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 QUESTIONS IN THIS SECTION.

1. The food chain below shows feeding relationships of organisms in an ecosystem.

   Grass → Grasshopper → Lizards → Snakes

   a) Mention one other method of presenting feeding relationships in organisms listed above. (2 mks)

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   .....

   b) Identify trophic levels occupied by; (2 mks)

   i) Lizards .....

   ii) Grass .....

   c) Which organisms would have;

   i) Lowest biomass? (1 mk)

   .....

   ii) Give a reason for your answer in c (i) above. (2 mks)

   .....

   .....

   d) State the economic importance of denitrifying bacteria in the nitrogen cycle. (2 mks)

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2. a) State two characteristics of mutations. (2 mks)

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   b) Explain why certain bacteria and other pathogens become resistant to drugs after long periods for use. (2 mks)

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   c) Using a Punnet square work out a cross between a haemophiliac man married to a woman who is a carrier to the haemophilia gene. (3 mks)

d) State the phenotypic ratio of the children born in this family. (1 mk)

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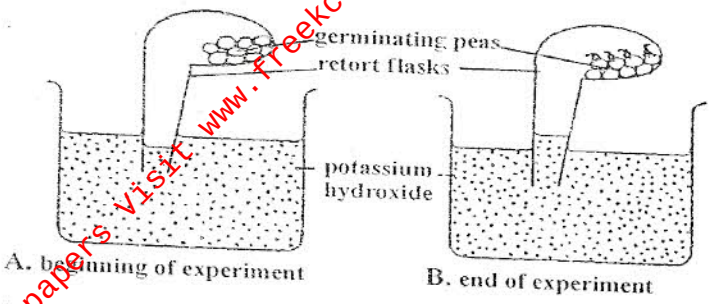
3. Soaked beans seeds were put in a flask and inverted in a beaker containing Potassium hydroxide as shown.



a) What was the aim of the experiment. (1 mk)

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b) What was the role of Potassium hydroxide in the set-up? (1 mk)

.....

c) Account for the observations made at the end of the experiment? (3 mks)

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d) i) Suggest observations that can be made if water was used instead of Potassium hydroxide. (1 mk)

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ii) Give a reason for your answer. (1 mk)

.....

e) What would be a suitable control for this experiment. (1 mk)

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4. a) When testing a green leaf for presence of starch, chlorophyll is first removed. Explain. (2 mks)

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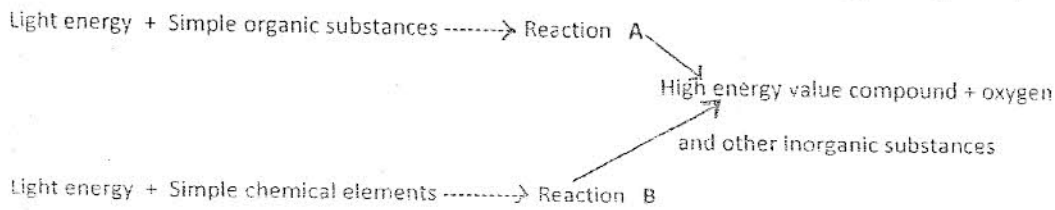
b) Study the scheme below that shows the pattern of production of energy in a green plant.



i) Name the reaction labelled A and B. (2 mks)

Reaction A .....

Reaction B .....

ii) Mention two inorganic substances needed for reaction A to occur. (1 mk)

.....

iii) Name a group of organisms that carry out reaction B. (1 mk)

.....

c) i) Suggest the identity of the high energy organic compound. (1 mk)

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ii) Write a word equation for the reaction that produces the high energy value compound and oxygen. (1 mk)

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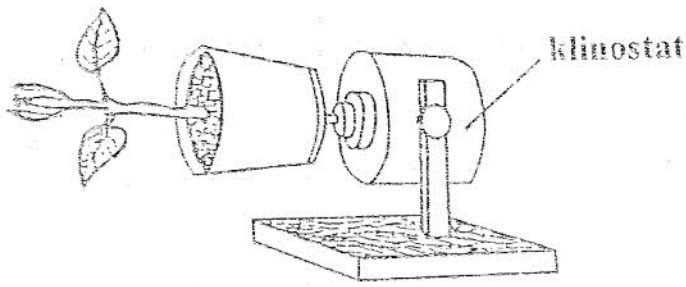
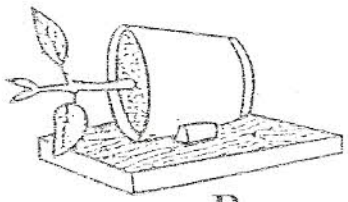
5. Two potted seedlings were placed in a horizontal position as shown. One seedling was placed in a clinostat. Both seedlings were exposed to the same light intensity for four days.



A



B

a) Identify the type of response demonstrated by the two set-ups. (1 mk)

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b) State observable changes in the seedlings in both set-ups after four days. (2 mks)

In set-up A

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In set-up B

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c) Account for your answers in A and B above. (2 mks

In set-up A

.....

.....

(2 mk

In set-up B

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6. **(Compulsory)**

An experiment was carried out to determine the effect of drinking excess amount of water on urine out put in a healthy person.

He drank one litre of water and urine released was collected at intervals of 30 minutes. The results were recorded in a table below.

Time in minutes	0	30	60	90	120	150	180	210	240	270	300
Urine output ml/min	1.6	1.6	1.6	2.8	8.0	9.0	8.9	8.6	5.6	1.0	0.8

a) Using the graph paper provided plot a graph of urine output against time. (6 mks)

b) With reference to the graph plotted, account for the rate of urine output between;

i) 0 - 60 minutes (2 mks)

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ii) 90 - 150 minutes (2 mks)

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iii) 240 - 300 minutes (2 mks)

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c) Describe the process of urine formation in the kidney nephron. (8 mks)

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7. a) Explain how support is attained in terrestrial plants. (13 mks)
   b) Describe the functions of the endoskeleton. (7 mks)

8. a) Describe the process of fertilization and implantation in the human female. (10 mks)
   b) Describe how a piece of starchy food is digested in the human digestive system. (10 mks)

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