Name ........................................................................

Index Number ............... / ..................

Candidate’s Signature .........................

Date ...................................................

231/2

BIOLOGY

PAPER 2 (THEORY)

JULY/ AUGUST 2013

TIME: 2HOURS

LENOCET EVALUATION TEST
KENYA CERTIFICATE OF SECONDARY EDUCATION

231/2

BIOLOGY

PAPER 2

Instructions to candidates

(a) Write your Name and Index Number in the spaces provided above.
(b) This paper consists of two sections. Section A and Section B. Answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.

For Examiner’s use only

<table>
<thead>
<tr>
<th>Section</th>
<th>Question</th>
<th>Maximum Score</th>
<th>Candidate’s Score</th>
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SECTION A (40MARKS)

Answer all the questions in this section in the spaces provided

1. The equation below shows a chemical reaction that takes place in green plants under certain conditions. 
   Carbon (iv) oxide + Water $\rightarrow$ Glucose + X
   
   (a) (i) What is the name of substance X? 
   
   (ii) Other than reagents, state two conditions necessary for this reaction 
   
   (iii) Name two types of cells in which this process occurs. 
   
   (iv) Name the process represented by the equation above. 

   (b) Name the features that increase the surface area of the small intestines. 

2. (a) What is meant by the term sex-linkage?

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

   (c) In Drosophila melanogaster, the inheritance of eye colour is sex-linked. The gene of 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.
   
   (Use R to represent the gene for red eyes)
3. (a) (i) Name the structure labelled P and give its role. (2marks)
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(ii) Give three features that enables structure labelled X carry out its functions. (3marks)
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(iii) Name types of blood vessels found in the structure labelled Y. (2marks)
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(b) State the mode of asexual reproduction in yeast. (1mark)
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

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

(a) (i) Name the type of response. (1mark)
________________________________________________________________________

(ii) Explain how the response named in (a) (i) above occurs. (3marks)
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
(b) What is the importance of tactic responses to microscopic plants? (1mark)

__________________________________________________________________

__________________________________________________________________

(c) State three applications of plant hormones in agriculture. (3marks)

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

5. Science club members designed an experiment as shown below. Examine it.

The set up was kept at room temperature for one week.

(a) What was the aim of the experiment? (1mark)

__________________________________________________________________

__________________________________________________________________

(b) What observation was made after one week. (2marks)

A ______________________________________________________________

B ______________________________________________________________

(c) (i) Explain the role of water in seed germination. (3marks)

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

__________________________________________________________________

(ii) Other than water, what two environmental factors are required for seed germination. (2marks)

__________________________________________________________________

__________________________________________________________________
SECTION B

Answer question 6 compulsory and either question 7 and 8 in the spaces provided after question 8

6. The following data represents the development in dry mass of germinating seedlings within 18 weeks.

<table>
<thead>
<tr>
<th>Time in weeks</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>10</th>
<th>13</th>
<th>15</th>
<th>16</th>
<th>18</th>
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</thead>
<tbody>
<tr>
<td>Dry mass ingrams</td>
<td>0.1</td>
<td>2</td>
<td>3.2</td>
<td>10</td>
<td>18</td>
<td>32</td>
<td>44</td>
<td>45</td>
<td>44</td>
<td>38</td>
</tr>
</tbody>
</table>

(a) Using suitable scales plot a graph of dry mass against time. (6marks)

(b) With reference to the graph, explain the changes in dry mass between;

(i) week 0 to 2 (2marks)
(ii) week 5 to 13 (2marks)
(iii) week 16 - 18 (2marks)

(c) (i) What is the significance of time zero. (1mark)
(ii) What difference will be expected from the above results if the experiment started with two seeds? Give a reason for your answer. (2marks)

(d) (i) Describe how you can carry out the experiment to obtain dry mass in the respective weeks. (4marks)
(ii) State one advantage of using dry mass instead of fresh weight in estimating growth of an organism. (4marks)

7. Describe the adaptations of the skin to its functions. (20marks)

8. (a) Define the term natural selection with reference to evolution. (2marks)
(b) Describe how natural selection brings about adaptation of species to its environment. (18marks)