EXAMINATIONS COUNCIL OF ZAMBIA
Joint Examination for the School Certificate
and General Certificate of Education Ordinary Level

BIOLOGY
PAPER 3 Practical Test

Wednesday 30 OCTOBER 2013

Additional materials:
As listed in Instructions to Supervisors.

TIME: 1 hour 15 minutes

INSTRUCTIONS TO CANDIDATES
Write your name, centre number and candidate number in the spaces provided at the top of this page.

There are two questions in this paper.
Answer both questions.
Write your answers in the spaces provided on the question paper.
Use sharp HB pencils for your drawings. Coloured pencils and crayons should not be used.

INFORMATION FOR CANDIDATES
The number of marks is given in brackets [ ] at the end of each question or part question.

Cell phones are not allowed in the examination room.
Answer all the questions.

1. You are provided with two thermometers A and B which have been kept at room temperature.

   ![Diagram of thermometers A and B with labels: Cotton thread, Dry tissue paper, Moist tissue paper sticks due to wetness]

   Wrap the bulb of thermometer B with moist tissue paper. Thermometer A is already wrapped for you with a similar amount of dry tissue.

   **(a)** Start reading the thermometer soon after wrapping the moist tissue to thermometer B and record temperature readings at intervals of one minute for a period of 5 minutes for each thermometer. Record the readings in table form in the space provided below.

<table>
<thead>
<tr>
<th>Room temperature reading</th>
<th>Thermometer A (Dry tissue)</th>
<th>Thermometer B (Moist tissue)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; reading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; reading</td>
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<td>3&lt;sup&gt;rd&lt;/sup&gt; reading</td>
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<td>4&lt;sup&gt;th&lt;/sup&gt; reading</td>
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<tr>
<td>5&lt;sup&gt;th&lt;/sup&gt; reading</td>
<td></td>
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</tbody>
</table>

[5]
(b) Draw graphs to show the relationship in temperature between the two environments of the thermometers on the same graph paper.

(c) Describe what happened to the temperature during the period of observation.
(i) Thermometer A ...

(ii) Thermometer B ...

(d) State the conclusion of the experiment.

(e) Why does a dog hang its tongue outside the mouth under certain conditions?
(f) (i) Make a drawing of visible external features of specimen X.

(ii) Examine one of the wings of specimen X. Measure the length of the wing. Calculate the magnification of the wing, using the drawing made in (f) (i) above.

Measurement of length of wing .................................................................

Magnification:
(d) Make a drawing of specimen C.

Measure accurately the longest side of the specimen.

Measurement: ..............................................................................................................

Calculate the magnification of the drawing.
Show your working in the space provided below.
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2 You are provided with Specimens C, D and E.

(a) What characteristic in specimens C, D and E shows;
   (i) continuous variation?
   .................................................................................................................. [1]
   (ii) discontinuous variation?
   .................................................................................................................. [1]

(b) (i) Which specimen shows co-dominance?
   .................................................................................................................. [1]
   (ii) Give reasons for your answer.
   ..................................................................................................................
   .................................................................................................................. [1]

(c) Birds with feathers D and E were crossed. All the offsprings of the F1 generation were the colour of E.
   Using suitable symbols show in form of a genetic diagram how this happened.