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

BIOLOGY
PAPER 3 Practical Test

Tuesday 30 OCTOBER 2001
1 hour 15 minutes

Candidates answer on the question paper
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 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 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.

FOR EXAMINER’S USE

1

2

Total

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[Turn over
1. You are provided with specimens W31 and W32.

(a) (i) Make a transverse section through the center of specimen W31 and make a large labelled drawing of the cut surface.

(ii) Measure the diameter of the cut surface of W31 and use this measurement to calculate the magnification of your drawing.

Diameter: .................................................................

Calculation:

\[ \text{Magnification} \] .................................................................
(b)  (i) State the main method of dispersal of seeds in **W31**.

(ii) Name **three** ways in which **W31** is adapted for the method of dispersal you have given in (b) (i) above.

1. .................................................................

2. .................................................................

3. ................................................................. [3]

(c)  (i) State **three** visible structural similarities between the cut surface of **W31** and **W32**.

1. .................................................................

2. .................................................................

3. ................................................................. [3]

(ii) State **three** visible structural differences between the cut surface of **W31** and **W32**.

<table>
<thead>
<tr>
<th></th>
<th>W31</th>
<th>W32</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
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</tbody>
</table>

[3]
2. You are provided with 2 pieces of Irish potato tissue which are immersed in solutions A and B. Each piece of potato tissue was 4.0 cm in length before they were put in solutions A and B.

(a) (i) Remove the piece in solution A and then gently remove excess solution from the piece using tissue paper. Measure its length and record your measurement in the appropriate column in the table below.

(ii) Repeat the processes described in (a) (i) above for the piece in solution B.

<table>
<thead>
<tr>
<th></th>
<th>ORIGINAL LENGTH</th>
<th>LENGTH AFTER IMMERSION</th>
<th>DIFFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potato tissue from</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solution A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potato tissue from</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>solution B</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

(b) Describe the concentration of solutions A and B in relation to the cell sap concentration of the potato tissue.

Solution A .................................................................
........................................................................

Solution B .................................................................
........................................................................ [4]

(c) (i) Explain your answer in (b) above for solution A.

........................................................................
........................................................................
........................................................................
........................................................................ [2]

(ii) Explain your answer in (b) above for solution B.

........................................................................
........................................................................
........................................................................
........................................................................ [2]
(d) Feel the texture of the pieces of potato tissue and state your results.

(i) Potato tissue from solution A.

............................................................................................................... [1]

(ii) Potato tissue from solution B.

............................................................................................................... [1]

(e) Explain your result in (d) above in terms of the state of the cells of the potato tissue.

(i) Potato tissue from solution A.

............................................................................................................... [1]

(ii) Potato tissue from solution B.

............................................................................................................... [1]

(f) When you add excess fertilizer to a well watered crop plant, it wilts. Explain what happens to the affected cells of the plant.

............................................................................................................... [4]
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