

Mark Scheme (RESULTS)

January 2008

GCE

GCE Biology (6106/02)

Question Number	Answer	Mark																																				
1 (a)	<table border="1"> <thead> <tr> <th>Quadrat No.</th> <th>No. of dogwhelks / m²</th> <th>Mean no. of barnacles / 25 cm²</th> <th>Number of barnacles / m²</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>14</td> <td>38.4</td> <td>15360</td> </tr> <tr> <td>2</td> <td>6</td> <td>14.4</td> <td>5760</td> </tr> <tr> <td>3</td> <td>9</td> <td>23.4</td> <td>9360</td> </tr> <tr> <td>4</td> <td>1</td> <td>14.4</td> <td>5760</td> </tr> <tr> <td>5</td> <td>12</td> <td>37.6</td> <td>15040</td> </tr> <tr> <td>6</td> <td>4</td> <td>14.0</td> <td>5600</td> </tr> <tr> <td>7</td> <td>10</td> <td>32.6</td> <td>13040</td> </tr> <tr> <td>8</td> <td>9</td> <td>21.6</td> <td>8640</td> </tr> </tbody> </table> <p>neat table correctly formatted (shaded column optional) ; correctly labelled rows and columns ; barnacle numbers correct (all correct = 2 marks, one error = 1 mark) ;;</p>	Quadrat No.	No. of dogwhelks / m ²	Mean no. of barnacles / 25 cm ²	Number of barnacles / m ²	1	14	38.4	15360	2	6	14.4	5760	3	9	23.4	9360	4	1	14.4	5760	5	12	37.6	15040	6	4	14.0	5600	7	10	32.6	13040	8	9	21.6	8640	4
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1 (b)	<p>A - graph correctly orientated with labelled axes ;</p> <p>F - scatter graph format with or without sensible line of best fit ;</p> <p>P - all points plotted correctly ;</p>	3

Question Number	Answer	Mark
1 (c)	<p>correct substitution of data ;</p> $r_s = 1 - \frac{6 \times 4}{512 - 8}$ <p>correct r_s value = 0.9683 ;</p>	2

Question Number	Answer	Mark
1(d)	<p>there is a significant correlation between numbers of dogwhelks and numbers of barnacles ;</p> <p>at the 5% confidence level (not simply $p=0.05$) ;</p>	2

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2 (a)	<ol style="list-style-type: none"> 1. collect roots of <i>Hieracium</i> and wash carefully ; 2. standard mass of root placed in standard volume of water ; 3. grind in pestle, and mortar filter extract ; 4. <i>Festuca</i> / grass seeds of same age and single species ; 5. stated number of <i>Festuca</i> seeds (min 10) used in each test ; 6. stated growth medium for germination test e.g. filter paper ; 7. seeds placed fixed distance apart ; 8. stated volume of extract added to each ; 9. use of same volume distilled / deionised water as control ; 10. placed in controlled light and temperature conditions ; 11. germinated seeds counted at least every 12 hours / total germinated counted after stated time ; 12. germination defined e.g. emergence of radicle ; 13. at least 5 tests for control and extract ; <p>SPG Account is concise and well-organised, there is good use of technical vocabulary and almost no spelling errors = 2 marks ;;</p> <p>There is some lack of organisation, limited vocabulary and a number of spelling errors = 1 mark ;</p> <p>The account lacks organisation, there is little or no technical vocabulary and many spelling errors = 0 marks</p>	<p>max 10</p> <p>2</p>

Question Number	Answer	Mark
2 (b)	<ol style="list-style-type: none"> 1. table of raw data with suitable accurately labelled rows and columns with units ; 2. calculation of mean % germination ; 3. suitable graphical format which matches hypothesis and method with correctly labelled axes ; 4. reference to suitable type of statistical test (for significant difference) ; 	4

Question Number	Answer	Mark
2 (c)	<p>Limitations [sub maximum = 4]</p> <ol style="list-style-type: none"> 1. difficult to judge time / actual germination ; 2. reference to differences between laboratory and field conditions ; 3. inhibitor may be unstable when extracted / eq ; 4. extract not necessarily the same concentration as in soil ; <p>Further Work</p> <ol style="list-style-type: none"> 1. test extract on growth of mature plants ; 2. test extract on different (grassland) plant species ; 3. reference to further analysis of extract to identify inhibitor ; 4. test effect of different concentrations of extract ; 	<p>max 5</p>

PAPER TOTAL: 32 MARKS