CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2013 series

0610 BIOLOGY

0610/63 Paper 6 (Alternative to Practical), maximum raw mark 40

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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Mark schemes will use these abbreviations

- ; separates marking points
- / alternatives
- **R** reject
- **A** accept (for answers correctly cued by the question)
- **I** ignore as irrelevant
- **ecf** error carried forward
- **AW** alternative wording (where responses vary more than usual)
- **AVP** alternative valid point
- **ORA** or reverse argument
- underline actual word given must be used by candidate (grammatical variants excepted)
- ( ) the word / phrase in brackets is not required but sets the context
- **D, L, T, Q** quality of: drawing / labelling / table / detail as indicated
- max indicates the maximum number of marks
- **BOD** benefit of doubt.

	Answer	Marks	Guidance for Examiners
1 (a) (i)	starch is present;	[1]	
(ii)	*count number of squares to estimate area* 17– 20	[1]	(actual area = 17.5 mm^2 based on πr^2) No working mark Accept answer in range 16→20 mm^2 .
(iii)	*Description;–* zone around **P** and **Q**; zone around **P** larger than **Q or ORA**; no zone around **R**;	[3]	Comparative term covers mpts 1 and 2. 'no clear zone around **R** but **P** and **Q** do '– award mpts 1 and 3. Accept ' iodine changed since starch not broken down'. Ignore 'growth'.

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(iv)	*Explanation:–* therefore enzyme must break down starch to form a clear zone; **P** must have more (concentrated) enzyme (as wider clear area); **R** has no enzyme in the water to breakdown starch; or enzyme breaks down starch; to produce clear areas; no enzyme – no breakdown of starch / water does not contain enzyme /AW;	[3]	
(v)	amylase / carbohydrase;	[1]	
(vi)	For comparison / control;	[1]	
(b)	1 remove testa / germinate peas; 2 preparation of 'enzyme from seed; 3 leave for 15 mins and then add iodine solution; 4 look for colour change / black to clear; 5 repeat for reliability / or to calculate an average; 6 controlled variable;	max[4]	For example: place pea on plate / grind up with specified volume of water to extract enzyme and place in hole in starch agar jelly/ cut the seed in half / **AW**. Accept idea of set time period. 1h max. Same size of pea / same species / same type / AW.

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<table>
<tr>
<td>(c)</td>
<td>O – outline;

S – size;

D – detail – show side root developing and split testa;

one label from: testa / radicle/ plumule / cotyledon;</td>
<td>[4]</td>
<td>Whole page allowed for drawing.

Larger than Fig 101 mm+

Not seed / shoot / root.</td>
</tr>
<tr>
<td>(d) (i)</td>
<td>
<table>
<tr><th>number of pea seeds in each pod</th><th>tally</th><th>number of pods</th></tr>
<tr><td>4</td><td>/</td><td>1</td></tr>
<tr><td>5</td><td></td><td>0</td></tr>
<tr><td>6</td><td></td><td>0</td></tr>
<tr><td>7</td><td></td><td>0</td></tr>
<tr><td>8</td><td>already</td><td>completed 3</td></tr>
<tr><td>9</td><td>////</td><td>4</td></tr>
<tr><td>10</td><td>already</td><td>completed 7</td></tr>
<tr><td>11</td><td>~~///~~</td><td>5</td></tr>
<tr><td>12</td><td>///</td><td>3</td></tr>
</table>
</td>
<td>[2]</td>
<td>Accept blank or 0 for 5 to 7 seeds in pod.
One for correct tally and number of pods.

All boxes correct – 2 marks.
1 error in tally and ecf for number of pods – 1 mark.
2 or more errors – no marks.

Place ticks under the columns.</td>
</tr>
</table>

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(ii)	**A** – axes – labelled and evenly scaled; **S** – size to fill more than ½ of grid; **P** – plotting accurate; **C** – columns of equal width **and** touching	[4]	x axis – number of seeds in pod and y axis number of pods. Label of number be central under column. If axes reversed max 3 for **S, P and C** **A** Within ±1 mm. ecf from tally table. If columns do not make contact.no **C** If line graph Max 2 – **A** and **S** only.
(iii)	**X** in bar for 4 peas	[1]	
(iv)	variation (genetic or environmental);	[1]	**A** not all peas fertilised in pod / mutation / change in weather e.g. very dry / cold / less nutrients / AW. **I** 'not counting correctly'.
		[Total: 26]	
2 (a)	length of line 10 mm; formula – ST length ÷ magnification 10 / 2.5; actual length of leg – 4.0 mm;	[3]	**A** ±1 mm. **A** word formula. 3.6, 4.0, or 4.4 mm if line ST is 9, 10 or 11mm.
(b)	*Group* – arachnid / arachnida / spiders; *reasons* – eight /8 legs / 4 pairs of leg; two /2 parts to body / cephalothorax and abdomen;	[3]	If incorrect group – allow one feature for that group visible in Fig. Ignore negative features / ref to teeth / 2 **segments.** Accept 2 parts to body.

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<table>
<tr><td></td><td></td><td>[Total:6]</td><td></td></tr>
<tr><td>3 (a)</td><td>label to root hair cell;
label to cortical cell;</td><td>[2]</td><td>Line needed to indicate cell.</td></tr>
<tr><td>(b)</td><td>
<table>
<tr><td rowspan="2">substance</td><td rowspan="2">reagent</td><td colspan="3">results</td></tr>
<tr><td>initial colour</td><td>final colour</td><td>positive or negative (√ or x)</td></tr>
<tr><td>water</td><td>cobalt chloride</td><td>blue</td><td>pink;</td><td>√</td></tr>
<tr><td>reducing sugar</td><td>Benedict’s;</td><td>blue</td><td>orange / red;</td><td>√</td></tr>
<tr><td>protein</td><td>biuret;</td><td>blue</td><td>blue / AW;</td><td>x</td></tr>
<tr><td>fat</td><td>ethanol + water</td><td>colourless</td><td>clear / colourless</td><td>x</td></tr>
</table>
</td><td>[6]</td><td>One mark per box.

A green yellow / yellow /

R mauve as it is the positive result for the presence of protein.</td></tr>
<tr><td></td><td></td><td>[Total: 8]</td><td></td></tr>
</table>

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