**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**Cambridge International General Certificate of Secondary Education**

# MARK SCHEME for the October/November 2015 series

## 0610 BIOLOGY

**0610/61** 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 October/November 2015 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.



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**Abbreviations used in the Mark Scheme**

- **;** separates marking points
- **/** separates alternatives within a marking point
- **R** reject
- **ignore** mark as if this material was not present
- **A** accept (a less than ideal answer which should be marked correct)
- AW alternative wording (accept other ways of expressing the same idea)
- underline words underlined (or grammatical variants of them) must be present
- max indicates the maximum number of marks that can be awarded
- mark independently the second mark may be given even if the first mark is wrong
- ecf credit a correct statement that follows a previous wrong response
- ( ) the word / phrase in brackets is not required, but sets the context
- **ora** or reverse argument
- AVP any valid point

| Question | Answer | Mark | Comments |
|---|---|---|---|
| 1 (a) | reagent: iodine solution / iodine in KI ;<br><br>brown to blue-black ;<br><br>eye protection / lab coat / gloves ; | [3] | **ignore** treatment of food, e.g. heating. |
| (b) (i) | axes labelled and scaled evenly<br>*x-axis* pH, *y-axis* time / mins ;<br><br>size to fill at least half or more of printed grid ;<br><br>points plotted accurately and not larger than ½ of a small square in size if dots used ;<br><br>clear unbroken line ; | [4] | |
| (ii) | pH4 ; | [1] | |
| (iii) | 2 ; | [1] | |

| Question | Answer | Mark | Comments |
|---|---|---|---|
| (iv) | *any 3 from:*<br><br>below optimum pH / pH4 – as pH increases (from pH3–4) the activity increases ;<br><br>above optimum pH / pH4 – as pH increases (from pH4–8) the activity decreases ;<br><br>use of <u>calculated</u> data ;<br><br>reference to gradient / AW ;<br><br>max [3] | | **A** below optimum pH, activity decreases / time increases / rate decreases<br><br>**A** above optimum pH, time increases / rate decreases<br>**A ora** as pH decreases from 8–4 the activity increases<br><br>e.g. between pH3 and 4 the time is 3.6 minutes less and between pH4 and 5 the time is 0.3 minutes more. Not just quoting figures.<br><br>**A** gradient is steeper before pH4 / gradient is less steep after pH4 |
| (c) (i) | *any two from:*<br><br>fresh enzyme / temperature / amount of agitation or shaking of test-tubes / same concentration or volume of enzyme / same concentration or volume of starch solution ;;<br><br>max [2] | | **A** amount / mass of enzyme or starch solution |

| Question | Answer | Mark | Comments |
|---|---|---|---|
| (ii) | *any two from:*<br><br>repeat / test pH values at smaller intervals between pH3–8 / test at pH values between (4–5) at smaller intervals to find a more accurate optimum pH / colour standard to compare end points / AVP ;; | max [2] | **A** put test-tubes in a water bath to control temp<br>**A** test each pH one at a time |
| | | **[Total: 15]** | |
| 2 (a) (i) | light 19-21 and dark 20-22 ; | [1] | |
| (ii) | 1:1 ; | [1] | |
| (iii) | smooth / wrinkled / have a dent / speckled / size / shape / AW ; | [1] | |
| (b) | *any 5 from:*<br>crushing grain in preparation ONCE only for either test ;<br><br>*protein test:*<br>reagent: biuret (solution) ;<br>colour change observed: – blue to purple ;<br><br>*fat test:*<br>add alcohol / ethanol ;<br>water is added to alcohol ;<br>emulsion formed / clear to cloudy / milky / white ; | max [5] | **R** heating |

| Question | Answer | Mark | Comments |
|---|---|---|---|
| (c) | oats ;<br><br>*any 2 from:*<br><br>fat content highest ;<br>protein content high ;<br>fat has a higher energy content than protein ; | max [3] | |
| | | **[Total: 11]** | |
| 3 (a) (i) | lamina / blade ;<br>midrib ;<br>veins ;<br>petiole / stalk ; | max [2] | |
| (ii) | *any 2 from:*<br><br>(P) is divided into leaflets ;<br>(P) has smooth edge ;<br>(P) does not have pointed tip ; | [2] | **A ora** if explicitly stated in terms of Q.<br>**A** edge of Q is toothed / irregular<br>**ignore** surface area |
| (b) (i) | drawing of outline uses single clear unbroken lines with no shading anywhere ;<br><br>drawing occupies at least half of the space provided ;<br><br>detail of large leaf with clear midrib and four veins radiating from same point and some branching veins ;<br><br>detail of both forked tendrils ; | [4] | |

<table>
<tr><th>Question</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td>(ii)</td><td>advantage:<br>grip / attach / climb / support / AW;<br><br>disadvantage :<br>less leaf area / less photosynthesis / AW ;</td><td>[2]</td><td></td></tr>
<tr><td>(c)</td><td>
<table>
<tr><td>features</td><td>eudicotyledonous</td><td>monocotyledonous</td></tr>
<tr><td>veins / (named) vascular (tissue)</td><td>network / branching / AW</td><td>parallel / AW ;</td></tr>
<tr><td>shape / size ;</td><td>broad / wide / AW</td><td>long / thin / elongated / AW ;</td></tr>
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</td><td>[3]</td><td></td></tr>
<tr><td></td><td></td><td>[Total: 13]</td><td></td></tr>
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