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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

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

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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

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

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Question	Answer	Mark	Comments
(iv)	*any 3 from:* below optimum pH / pH4 – as pH increases (from pH3–4) the activity increases ; above optimum pH / pH4 – as pH increases (from pH4–8) the activity decreases ; use of <u>calculated</u> data ; reference to gradient / AW ; max [3]		**A** below optimum pH, activity decreases / time increases / rate decreases **A** above optimum pH, time increases / rate decreases **A ora** as pH decreases from 8–4 the activity increases 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. **A** gradient is steeper before pH4 / gradient is less steep after pH4
(c) (i)	*any two from:* fresh enzyme / temperature / amount of agitation or shaking of test-tubes / same concentration or volume of enzyme / same concentration or volume of starch solution ;; max [2]		**A** amount / mass of enzyme or starch solution

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Question	Answer	Mark	Comments
(ii)	*any two from:* 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 **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:* crushing grain in preparation ONCE only for either test ; *protein test:* reagent: biuret (solution) ; colour change observed: – blue to purple ; *fat test:* add alcohol / ethanol ; water is added to alcohol ; emulsion formed / clear to cloudy / milky / white ;	max [5]	**R** heating

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

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<table>
<tr><th>Question</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td>(ii)</td><td>advantage:
grip / attach / climb / support / AW;

disadvantage :
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>
</table>
</td><td>[3]</td><td></td></tr>
<tr><td></td><td></td><td>[Total: 13]</td><td></td></tr>
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