CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0610 BIOLOGY

0610/53 Paper 5 (Practical Test), maximum raw mark 40

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Abbreviations used in the Mark Scheme

- ; separates marking points
- / separates alternatives within a marking point
- R reject
- I ignore (mark as if this material was not present)
- A accept (a less than ideal answer which should be marked correct)
- AW alternative wording
- underline words underlined 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
- A, S, P, L Axes, Size, Plots and Line for graphs
- O, S, D, L Outline, Size, Detail and Label for drawings
- (n)ecf (no) error carried forward
- ( ) 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	Marks	Additional Guidance
1 (a)	table with six cells for observations; appropriate column/row headings; observations recorded before and after sticks are placed in liquids; same observation for all sticks before being placed in the liquids; stick **A** slimier / floppier / breaks easier than **B** or **C**;	**5**	**A** 3 columns & 2 rows **or** 2 columns & 3 rows compare to Supervisor's Report and credit if results match
(b) (i)	distilled water – **B** dilute sugar solution – **C** concentrated sugar solution – **A** one correct = 1 mark all correct = 2 marks	**2**	
(b) (ii)	in strong sugar solution/A: potato feels floppy / cells are plasmolysed **and** water moves out of the potato / AW; in water/B: potato feels firm / cells are turgid **and** water molecules move into the potato; in weak sugar solution/C: potato feels the same (as the start) and no (net) movement of water / AW;	**3**	descriptions of osmosis must be clearly linked to results **A** ecf

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<table>
<tr><td>(c)</td><td>idea that one chip may not have behaved as expected / makes results more reliable / more likely to see appropriate trend / reduces impact of anomalies;</td><td>1</td><td>R accurate / precise</td></tr>
<tr><td>(d)</td><td>
<table>
<tr><th></th><th>change</th><th>explanation</th></tr>
<tr><td>1</td><td>leave for longer than 15 minutes</td><td>more likely to see the change</td></tr>
<tr><td>2</td><td>measure length or mass before and after / change in length</td><td>more precise / quantitative results</td></tr>
<tr><td>3</td><td>increase the range of sugar solutions</td><td>can see the trend more easily</td></tr>
<tr><td>4</td><td>control temperature</td><td>temperature affects the rate of osmosis</td></tr>
<tr><td>5</td><td>idea of controlling other variables</td><td>ensures that results are only due to the difference in solutions</td></tr>
</table>
</td><td>max 4</td><td></td></tr>
<tr><td></td><td></td><td>[Total: 15]</td><td></td></tr>
</table>

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2 (a)	measurement of **AB**: 43 ± 1 (mm); formula: magnification = AB ÷ actual diameter or 43/4.3; magnification: = (×) 10;	**3**	**A** ecf from measurement **A** words or figures **I** units given for magnification **A** if formula uses their measured diameter and actual length incorrectly in either a multiplication or inverted division then no marks for formula but allow 1 for correct calculation
(b)	decrease in diameter: 4.3 (**AB**) – 2.0 (**CD**) = 2.3 (mm); formula: 2.3 / 4.3 × 100; calculation: 53/54 (%);	**3**	**I** units whole number answer required
		[Total: 6]	

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3 (a)	<table><tr><td>difference</td><td>**E**</td><td>**F**</td></tr><tr><td>shape / outline / projections</td><td>blades / wings / aerodynamic shape / smooth / 2 projections / AW</td><td>spines / thorns / spikes / hooks / branched / uneven / many or 5+ projections /AW;;</td></tr><tr><td>symmetry</td><td>regular</td><td>irregular;</td></tr><tr><td>point of attachment</td><td>visible</td><td>not visible;</td></tr><tr><td>seed position/ seed</td><td>at one end / two</td><td>not visible / one / number not known (seeds/cores/parts);;</td></tr></table> any two;;	**max 2**	**A** AW throughout differences must be comparative or contrasting for both fruits

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(b) (i)	**A** – axes labelled **and** scaled evenly; **S** – size; **P** – points plotted accurately ±½ small square; **L** – line E or F correct; **K** – labelling of both lines / key;	**5**	*x*-axis: wind speed / ms^{-1} *y*-axis: average distance / m **I** orientation if no '0' on an axis then scale can begin at any number but if '0' on an axis then scale must be even or have discontinuity mark plots to fill half, or more than half, of grid along both axes **A** 1 plotting error lines should be point to point ±½ small square **A** ruled lines or smooth unbroken line **R** double lines / sketchy lines / broad lines > ½ small square **R** extrapolation > ½ small square other graphs (e.g. histogram / bar chart) = max 4 (no **L**)
(b) (ii)	distance travelled by **E** increases with wind speed / positive correlation between the two / AW;	**1**	
(c)	**O** – outline is single clear line (and no shading anywhere); **S** – size is larger than photograph; **D** – detail; **L** – one label from testa / seed coat / radicle / plumule / cotyledon / hypocotyl;	**4**	**I** minor overlaps or breaks drawing larger than 60 mm (length from top of plumule to tip of radicle) **R** if drawing touches / extends into printed words minimum detail of seed with radicle below seed equal to or longer than the seed, tapering at the tip.

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(d) (i)	temperature;	**1**	
(d) (ii)	how many germinate / rate of germination / % germinated / time taken (to germinate);	**1**	**A** number that grow
(d) (iii)	volume of water; concentration / percentage of oxygen; seed type / species / age / size / AW;	**max 2**	**A** amount of moisture **I** pH / light / soil type / minerals / humidity
(e) (i)	prepare seed; test with Biuret reagent;	**2**	**A** cut / chop / crush / grind / AW **A** use a piece of seed **A** add to water **/** form a solution **A** alternative tests e.g. Millon's / xanthoproteic / albustix
(e) (ii)	blue to lilac / mauve / purple;	**1**	**A** colour changes for alternative tests: Millon's – clear to brick red xanthoproteic – yellow to orange albustix – yellow to green
		[Total: 19]	

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