CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2013 series

0610 BIOLOGY

0610/62 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.

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	Answer	Mark	Guidance for Examiners
1 (a) (i)	*Independent variable* – (attachment / presence or absence of) leaves;	[1]	
(ii)	to prevent / stop the evaporation (of water from the surface) / **AW**;	[1]	
(iii)	*Height of water in:* test-tube without leaves 65 mm **and** test-tube with leaves 51 mm;	[1]	**Both measurements** correct for **one** mark. **A** +/– 1 mm Reject cm or inch values unless the units are changed [inches 2.5 and 2.0]
(iv)	*Description*: (test-tube) with leaves is less than without leaves **Or** without leaves is more; *Explanation* : transpiration / evaporation (of water from the leaves);	[2]	**Accept** with leaves has lost more water / without leaves has lost less water. explanation should relate to their description **Ignore** ref. to photosynthesis / respiration / growth / water uptake / water use.
(b) (i)	*distance moved by coloured water in* shoot without leaves …… 12 mm shoot with leaves ……...90 mm;	[1]	**Both measurements** correct for **one** mark. **A** +/– 1 mm
(ii)	(yes) as (more) water taken up / absorbed in shoot <u>with</u> leaves / less water taken up by shoot <u>without</u> leaves; (so) the water in the test-tube is lower <u>with</u> leaves / water is higher in the test-tube <u>without</u> leaves / AW;	[2]	award both marks if explanation implies both ideas. **A.** water uptake faster in shoots with leaves. Ignore 'used or consumed water'. If **No** reject first mark but ecf for explanation if applied link.

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	Answer	Mark	Guidance for Examiners
(iii)	3 of: 1 idea of at least three temperatures tested; 2 suitable range of temperatures; 3 control variable (eg light / wind / height or volume of water / humidity); 4 **method** of measuring rate of water uptake; 5 Repeat for reliability;	[max 3]	Ignore how the temperature is being changed Accept 5 °C–40 °C If used 'hot and 'cold' aware of testing more than one temperature allow **1 mark** for first 2 marking points. Accept alternative control variables – same age / type / species / same number of leaves. Need **both** time and mass / distance / height in shoot or test-tube. e.g. mass lost per unit time / time taken to reach given height in shoot / height reached after time/ fall in mass of water in test-tube per unit time. Ignore if 'repeat alone' needs qualification. Ignore repeat for **accuracy.**

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	Answer	Mark	Guidance for Examiners
(c) (i)	**A**xes – labelled with units and suitable scale; **S**ize – occupies at least half the grid; **P**lot – points plotted accurately ±½ small square; **L**ine – connecting all plot points ± ½ small square;	[4]	if axes reversed – reject **A** mark but continue marking ecf if correct for **S**,**P** and **L** x axis – time of day (using 24 h clock), y axis – mass lost / g – (**see exemplars)**. Accept 1 error in plots. Plot points must not be larger than ½ small square. Plots must be in correct time of Table 1.1 sequence [see exemplars]. **Accept** point to point / smooth curve. **R** lines that are curved up or down unevenly between the points and thick lines / extrapolation more than 1 small square / bar charts. For bar charts and histogram allow A, S and P Max 3. Reject line of best fit.
(c) (ii)	*description* – mass / weight loss occurs during the day / light or decreases / stops at night / in dark / AW; *explanation* – transpiration / water loss during the day or light **or** less water loss at night or darkness / AW; reason for correct ref. to stomata opening / closing	[3]	 Accept evaporation. Ignore ref. to absorption / use of water / growth / photosynthesis / respiration. It is important that transpiration is linked to day or ORA. Do not allow for the word ‘transpiration’ alone. Mass loss during the day by transpiration through stomata = 3 marks.
(d)	G: epidermal cell; H: guard cell;	[2]	Allow epidermis / cuticle
(e) (i)	12;	[1]	**A** 11

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	Answer	Mark	Guidance for Examiners
(ii)	0.4 (mm);	[1]	Ignore working.
(iii)	0.4 x 0.4; 0.16 (mm^2);	[2]	**A ecf** from **(ii)** Allow both marks for a correct answer without any working.
(iv)	$\frac{12}{0.16}$ or $\frac{1}{0.16}$ x12; 75;	[2]	Allow both marks for a correct answer without any working. Answer **must be a whole number.** Answer in **(i)** is divided by answer in **(iii)**. **Accept ecf** from **(iii)** instead of 0.16. **Accept** 11 stomata from **(i)** = 69. if 0.16 used. **R** 68.75 not a whole number.
(v)	675000;	[1]	**A ecf** from **(iv)** 621000 for 11 stomata or 618750 if use 68.75)
		[Total: 27]	

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<table>
<tr><th></th><th>Answer</th><th>Mark</th><th>Guidance for Examiners</th></tr>
<tr><td>2 (a)</td><td>Outline - clear unbroken lines and no shading;

Size - occupies at least half the space up to [4] mark allocation;

Detail - nail, hair, cuticle, wrinkle, joint; [this a drawing mark]

Label – any one of detail features;</td><td>[4]</td><td>Ignore extra part fingers or hand.

Size should be at least 63mm or larger.
Use the measuring tool on screen.

at least 2 details drawn for 1 mark
allow nail bed / cuticle / scars / freckles / mole / blood vessel.
if drawn from palm view allow fingerprint as one detail.

Ignore incorrect labels.</td></tr>
<tr><td>(b) (i)</td><td>similarity – (both) 5 digits / fingers / nail / claws / toes;</td><td>[1]</td><td>Allow fingers with 2 joints / 3 sections / palm.
Allow 4 fingers and a thumb</td></tr>
<tr><td>(ii)</td><td>
<table>
<tr><th>feature</th><th>mole’s hand</th><th>your hand</th></tr>
<tr><td>shape

and

size</td><td>thick / fat / chubby
wide / broad
round / circular

small / 18–20 mm
large in proportion to body
short / small fingers</td><td>thin /
long / narrow /
oval / rectangular;

large / 140–200 mm;
small in proportion to body ;
long / large fingers;</td></tr>
</table>
</td><td>Max [2]</td><td>Mark whole table together

Give two marks for any two comparisons. If one box completed with comparative term eg accept broader

Accept any idea that proportionally the mole fingers are short in relation to palm of hand / ORA.
Ignore reference to hairs.</td></tr>
<tr><td>(c) (i)</td><td>mammals / mammalia;</td><td>[1]</td><td></td></tr>
<tr><td>(ii)</td><td>hairs / fur / whiskers / bristles / AW;</td><td>[1]</td><td>Accept visible features only. Ignore incorrect features.</td></tr>
<tr><td></td><td></td><td>[Total: 9]</td><td></td></tr>
</table>

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	Answer	Mark	Guidance for Examiners
3 (a)	<table><tr><td></td><td>*total number of flies*</td><td>*mean number of flies*</td></tr><tr><td>*purple*</td><td>8</td><td>4</td></tr><tr><td>*green*</td><td>15;</td><td>5;</td></tr></table>	[2]	Mark by columns. 1 mark for both totals 1 mark for both means
(b)	2 of: (Repeat) more lilies / flowers (of each type); same number of both colours / equal numbers / one more purple / AW; sample from a number of different habitats; method of preventing flies escaping;	Max [2]	No mark for repeat alone. 'Same number (of green sheaths) one mark. Accept 'take 10 green and 10 purple' = 2 marks. Ignore controlled variables e.g. same age, size, mass growing conditions.etc.
		[Total: 4]	

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