CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2014 series

0610 BIOLOGY

0610/52 Paper 5 (Practical Test), 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.

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Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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Question	Mark scheme	Mark	Guidance
1 (a)	to red / pink ;	[1]	
(b)	1 table with 2 columns ; 2 column 1 heading block / tube ; 3 column 2 heading time ; 4 units column 2 – seconds / s(ec) ; 5 four results recorded (in seconds), with time for D shorter than time for A ora ;	[5]	***A*** *horizontal orientation of table*
(c) (i)	(volume) = 2 ; cm^3 ;	[2]	
(ii)	(surface area) 2 (1 × 1) + 4 (2 × 1) ; 10 ;	[2]	
(iii)	*Idea of:* so that only surface area is being changed / surface area is the variable / only one variable being changed ;	[1]	

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Question	Mark scheme	Mark	Guidance
(d)	*observation from table :* 1 e.g. tube A took longest to change colour / tube B / C / D took less time to change colour / description of sequence ; *explanation:* 2 smaller pieces have (total) larger surface area / ora ; 3 idea of more (surface area) gives greater contact (with the acid) ; <u>4 ref. to diffusion</u>; 5 (so) the greater the surface area the faster the colour change or (rate of) reaction / quicker the acid gets to the centre of the block ;	[1] max [3]	

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<table>
<tr><th>Question</th><th>Mark scheme</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>(e)</td><td>Any 2 × 2
<table>
<tr><td>source of error:</td><td>improvement:</td></tr>
<tr><td>1 idea of cutting cubes accurately</td><td>use cutters / make up agar in premeasured moulds / template / use a more precise ruler / use a sharper knife / keep in fridge so stiffer ;</td></tr>
<tr><td>2 idea of contamination / damage to cubes from handling</td><td>wear gloves / use forceps or suitable instrument to move agar pieces ;</td></tr>
<tr><td>3 difficult to judge end point / AW</td><td>use white / black background / do each tube separately ;</td></tr>
<tr><td>4 small cubes stick together so not all surface area exposed</td><td>separate with a glass rod / spill / suitable apparatus ;</td></tr>
<tr><td>5 amount / volume of sulphuric acid poured into each tube</td><td>use a burette / graduated pipette instead of measuring cylinder ;</td></tr>
<tr><td>6 timing all at the same time (so end point missed)</td><td>time each separately ;</td></tr>
<tr><td>7 acid is added at different times</td><td>time each separately / stagger the start / method of adding acid to all tubes at same time ;</td></tr>
</table></td><td>max [4]</td><td>mark in pairs looking for a linked error and improvement</td></tr>
<tr><td>(f) (i)</td><td>bile required to emulsify / break down large fats droplets to smaller droplets ;

(this) increase the surface area of the fat to react with <u>enzyme</u> (so tube F has the fastest reaction) ;</td><td>[2]</td><td></td></tr>
</table>

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Question	Mark scheme	Mark	Guidance
(ii)	(as a) control / proves that the enzyme is needed for the reaction / for comparison ;	[1]	**A** to show what happens without the enzyme / to see the effect of the enzyme / time taken for fats to breakdown without enzyme **R** control the experiment / is a controlled variable / **aw**
		[Total: 22]	
2 (a)	*drawing:* **O** – outline ; **L** – labels – any 2 of : lamina / (leaf) blade ; (leaf) edge / margin ; petiole ; midrib ; vein ;	[1] [2]	
(b) (i)	value correct from number squares enclosed / evidence of surface area calculated ;	[1]	
(ii)	use (a grid with) smaller squares ;	[1]	
(c)	(H is lowest as) it has a larger surface area / is the largest ; to capture more light / allow transpiration ;	 [2]	

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Question	Mark scheme	Mark	Guidance
(d) (i)	**A** – both axes labelled and scaled evenly ; **S** – size to fill at least ½ of grid ; **P** – plot ; **L** – straight line of best fit ;	[4]	accurate plots to ± 0.5 of grid square
(ii)	as surface area increases, water loss also increases ; reference to the linear pattern or graph / proportional increase or description / positive correlation / some processing of data ;	[2]	
(e)	(measurement) length of JK = 14 (mm) ;	[1]	
	(formula) $\frac{\text{(length of stomata)}}{\text{(magnification)}} = \frac{14}{400}$;		
	(calculation mark) = 0.035 (mm) ;	[2]	**A** ecf for calculations from an incorrect measurement rounding of figures must be correct –'5' rounds up

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Question	Mark scheme	Mark	Guidance
(f)	any 2 of : temperature ; wind (speed) / air movement ; light wavelength ; time in the light / duration of light ; humidity ; age of leaf ; species / type of plant ; carbon dioxide (concentration) ; (surface) area of leaf ; water supply to leaf / plant ;	max [2]	
		[Total: 18]	

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