CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2013 series

5090 BIOLOGY

5090/61 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 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
- **()** contents of brackets are not required but should be implied
- **R** reject
- **A** accept (for answers correctly cued by the question, or guidance for examiners)
- **Ig** ignore (for incorrect but irrelevant responses)
- **AW** alternative wording (where responses vary more than usual)
- **AVP** alternative valid point (where a greater than usual variety of responses is expected)
- **underline** actual word underlined must be used by candidate (grammatical variants excepted)
- **max** indicates the maximum number of marks that can be given
- **+** statements on both sides of the + are needed for that mark

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		Mark	Notes
1 (a) (i)	1. time on x axis + temperature on y ; 2. both axes labelled + units + linear scales ; 3. good use of grid – y-axis 35–70 °C; 4. correct plots ; 5. plots joined by good quality lines or lines of best fit drawn ; 6. lines identified by label or key ;	6	2. minimum time/min and temp/ °C **R.** t for either
(ii)	temperature decreases / falls / in all three ; most / fastest in A ; least in B / stays about the same; intermediate in C / AW; temperature changes calculated for each tube – **A** 33 °C **and B** 2 °C **and C** 8 °C;	3 max	**A.** correct answers in terms of heat loss

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(iii)	*One mark each for an improvement and an explanation for that improvement up to 4 max. from the following:* ***improvement*** repeat / replicate ; ***explanation*** increase reliability / identify error / calculate mean / average; ***improvement*** hotter water at start ; ***explanation*** greater difference in temperature of water and room / heat loss more pronounced ; ***improvement*** water at same temperature in all tubes at start ; ***explanation*** same amount of heat available to be lost /AW; ***improvement*** same volume of water in all tubes at start ; ***explanation*** same amount of heat available to be lost / AW; ***improvement involving ensuring external conditions are the same for all*** all tubes kept at same room temperature / use screen / prevent draughts ; ***explanation*** to prevent (variable) external conditions influencing the rate of heat loss/ AW ;	4 max	**Ig.** wrapping / insulating **Ig.** adding another layer of tubes as those are extensions to the method not improvements thermometers are not mentioned as the method of measuring temperature so **I.** refs. to more use of sensitive probes etc.

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(b) (i)	**B** ;	1	
(ii)	lowers surface area (for heat loss) to volume ratio ; less heat radiated / lost to environment; ref insulation ; heat transferred from hotter to colder ;	2 max	
		[16]	
2 (a)	Ref. to orientation of leaves ; Ref. to condition of leaves;	 2	O – wilting, drooping, facing down / ORA C – withered, shrivelled, dried up, crinkly
(b) (i)	*In Table 2.1 no. of sections* **D** 5 ; **E** 1 *;*	2	
(ii)	*In Table 2.1 distance moved* **D** 50 ; **E** 10 ;	2	
(iii)	transpiration / evaporation / capillarity ;	1	
(iv)	water lost at faster rate in **D;** **D** has greater leaf surface area than **E** / AW ; guard cells flaccid / stomata closed in E / ORA ;	 max 2	 **A.** guard cells close in E
		[9]	

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3 (a) (i)

type	length	no.	crown shape	root
incisor	–	8	chisel / flat / straight / even / AW ;	–
canine	–	–	pointed / sharp;	single ;
premolar	–	8	–	single ;
molar	–	–	Uneven / rough / cusped ;	Double / triple;

3

All 8 correct = 3

6 or 7 correct = 2

4 or 5 correct = 1

(ii) incisor cutting / biting ;
molar crushing / grinding ;

2

R. chewing for incisor
A. chewing for molar

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	(b) (i)	more / 38 v 32 / 19 v 16 ; canines larger / AW ; canines more pointed / sharper; more premolars ; more premolars in lower jaw than upper jaw + same no. in humans; premolars of different sizes / shapes + similar (sizes / shapes) in humans; molars of different sizes / shapes + similar (size / shape) in humans; last molar is smaller than others + same size in humans; idea that (dog) molars have double (or single) roots + human molars have triple (or double); idea that (some) (dog) premolars have double roots + human premolars have single; crowns different heights /more uneven (in dogs) + similar height /even in humans / AW; molars are uneven / pointed / AW + flatter /AW in humans;	3 max	Mark scheme refers to dog
	(ii)	piercing / holding / gripping / killing / ripping / tearing;	1	
	(c)	more than 1 area of shading between teeth / shading at boundary of gum ;	1	
			[10]	
4	**(a)**	Benedicts + heat ; blue (at start); green / yellow / red shows presence ; safety feature ;	4	**A.** use of hot water bath = heating use of water bath / goggles
	(b)	diabetes ;	1	
			[5]	
		Paper total	**[40]**	

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