Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/61**

Paper 6 Alternative to Practical **October/November 2016**

MARK SCHEME

Maximum Mark: 40

Published

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.

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This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

Abbreviations used in the Mark Scheme:

- **;** separates marking points
- / alternatives
- **I** ignore
- **R** reject
- **A** accept (for answers correctly cued by the question, or guidance for examiners)
- AW alternative wording
- AVP any valid point
- ecf credit a correct statement / calculation that follows a previous wrong response
- **ora** or reverse argument
- ( ) the word / phrase in brackets is not required, but sets the context
- underline actual words given must be used by the candidate (or grammatical variants of them)

Question	Answer	Mark	Guidance
1(a)	one table drawn with lines; correct column / row headings (time and temperature); appropriate units (°C and minutes) in the header only; correct temperatures recorded for beaker A; correct temperatures recorded for beaker B;	**5**	

Question	Answer	Mark	Guidance
1(b)(i)	temperature differences: Beaker **A** = 12.5 °C, Beaker **B** = 20 °C; divide both temperature differences by 5 (minutes); **A** = 2.5, **B** = 4; correct units (°C / min);	**4**	
1(b)(ii)	the greater the volume of the body the smaller the rate of heat loss / ref to speed (e.g. slower) / **ora**; rate of heat loss in **A** is less than beaker **B** / **ora**; appropriate data quote comparing **A** and **B**; the greater the volume of the body the greater the (total) heat loss / **ora**;	**2**	
1(c)(i)	*any 2 from:* temperature of environment; size / volume of beaker / shape; starting temperature of water; time intervals / 1 minute to record temperature; total time / 5 minutes for investigation;	**2**	
1(c)(ii)	idea of time taken for the thermometer to reach the water temperature is longer;	**1**	

Question	Answer	Mark	Guidance
1(c)(iii)	*error:* drawing the line accurately / judging the water level against the line / measuring height (rather than volume); *improvement:* measure the volumes of water / AW ;	**2**	**A** not measuring volume **I** different sizes unqualified **A** beakers of different sizes would mean volumes would be inaccurate for the error and using identical beakers for the improvement
1(c)(iv)	gloves; heat mats under beakers; goggles; use tongs; wear a lab coat; standing up throughout the investigation;	**1**	**A** any suitable safety precaution

Question	Answer	Mark	Guidance
1(d)	*any 6 from:* 1 identical containers / containers of equal volume / containers of equal size; 2 same volume of water in each container; 3 same starting temperature for the water; 4 idea of placing (containers) in 2 or more different temperatures; 5 detail of method to keep external temperature constant, e.g. use of water-bath or a fridge and explanation; 6 measure temperature in each container for the same time / measure temperature in each container at set intervals; 7 repeat and calculate an average / mean; 8 calculate / compare rate of heat loss (for each temperature);	**6**	 **A** same depth **A** named places **A** time how long it takes for temperature to fall a set number of degrees **A** repeat to identify anomalies

Question	Answer	Mark	Guidance
1(e)(i)	**A**(xes) – labelled with units; **S**(cale) – even scale and plots to fill half or more of the printed grid ; **P(**lot) – all points plotted accurately ± ½ square ; **L**(ine) – line joining all the points ± ½ square ;	**4**	**A** points joined by ruled lines / curved line of best fit **R** bar chart or if line extrapolates beyond the plot points
1(e)(ii)	as temperature increases (rate of) sweating increases / **ora**; idea of increasing rate of increase as temperature rises / not a linear relationship / not directly proportional;	**2**	**A** higher temperature, more sweat **A** exponential increase
	Total:	**29**	

Question	Answer	Mark	Guidance
2(a)	<table><tr><th>letter</th><th>genus of flower</th></tr><tr><td>**A**</td><td>Geranium</td></tr><tr><td>**B**</td><td>Sorghum</td></tr><tr><td>**C**</td><td>Draba</td></tr><tr><td>**D**</td><td>Fuschia</td></tr><tr><td>**E**</td><td>Dactylis</td></tr></table> ;;;;	**4**	4 or 5 correct = 4 marks 3 correct = 3 2 correct = 2 1 correct = 1

Question	Answer	Mark	Guidance
2(b)(i)	**O**(utline) – single clear lines and without shading; **S**(ize) – occupies at least half of the space provided; **D**(etail) to show anther and filament in approx. the correct proportion (anther approx. half the length of filament); **L**(abel) to both anther **and** filament / stamen;	**4**	
2(b)(ii)	length of filament on Fig.2.2 with units = 27–31 mm; length of filament on drawing with units; correct calculation from candidates figures;	**3**	**A** measurements in cm **A** ±1 mm for their measurement ecf for correct calculation from incorrect measurements
	Total:	**11**	