Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

BIOLOGY **5090/31**

Paper 3 Practical Test **May/June 2018**

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 International will not enter into discussions about these mark schemes.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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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)
ORA	or reverse argument
underline	actual word underlined must be used by candidate
+	statements on both sides of the + are needed for that mark

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Question	Answer	Marks	Guidance
1(a)(i)	12 temperatures recorded, one in each box of table ; decrease in temperature in both test-tubes ;	**2**	
1(a)(ii)	repeat the (same) experiment ; calculate the mean / average ; ensure same initial temperature for both test-tubes ;	**2**	
1(b)(i)	**1** time on x-axis + temperature on y-axis, labelled at least t / min + temp / °C ; **2** linear scales with values at the origin for both axes ; **3** 12 points plotted clearly and correctly ; **4** centres of points joined with ruled, straight lines ; **5** lines identified by label or key ;	**5**	
1(b)(ii)	working shown on graph ; correct reading from graph + °C ;	**2**	
1(b)(iii)	accurate interpretation of actual graph drawn ; both animals / test-tubes lose heat ;	**1**	

Question	Answer	Marks	Guidance
1(c)(i)	**either** *size* lower surface area : volume (ratio) animals at South Pole / cold climates **ORA ;** *explanation* less heat loss / more heat retained **;** **or** *size* larger animals at the South Pole / cold climate **ORA ;** *explanation* less heat loss / more heat retained / lower surface area : volume (ratio) **;**	**2**	
1(c)(ii)	reduces / slows heat loss / retain more heat **;** reduces surface area : volume (ratio) **;**	**2**	
2(a)	**1** tooth in photograph drawn at least 60 mm long **;** **2** clear, continuous outline drawn with sharp pencil + no shading **;** **3** level crown with small / accurate / realistic indent in outline + two roots drawn **;** **4** roots less than half total length of tooth + left-hand root curves right at base **;**	**4**	
2(b)(i)	**1** vertical line indicating max length of tooth in both photo and drawing **;** **2** two correct measurements of lines drawn **;** **3** correct units at least once **;**	**3**	

Question	Answer	Marks	Guidance
2(b)(ii)	drawing measurement divided by measurement of the tooth in photograph **;** correct answer **;**	**2**	
2(c)(i)	sample of plaque removed from teeth / method of removing plaque described **;** use Universal Indicator / pH probe / pH sensor / pH meter **;** compare with colour chart / observe colour change or read value **;**	**3**	
2(c)(ii)	(lower) after food / drink is consumed / mealtime **AW ;** reference to sugar **;** reference to bacteria **;** anaerobic respiration **;** (lactic) acid produced **;**	**4**	**A** any reference to acid or increased acidity
2(c)(iii)	student **Q** eats more often **AW ;** more time / most of the time (compared to **P)** with teeth in low pH range / below 5.5 **;** <u>acid</u> damages enamel / causes decay **;**	**3**	

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Question	Answer	Marks	Guidance
2(d)	**1** same food eaten by all students **;** **2** measure pH of plaque after eating before mouthwashing **;** **3** mouthwash used **;** **4** measure pH of plaque after mouthwashing **;** **5** after same time period**;** **6** half sample / 5 students use mouthwash + half sample / 5 students use no mouthwash / (distilled) water **;** **7** correct reference to control group (non-mouthwash) **;** **8** equal <u>volumes</u> of mouthwash / (distilled) water **;**	**5**	

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