Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

BIOLOGY **5090/32**

Paper 3 Practical Test **May/June 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.

Cambridge is publishing the mark schemes for the May/June 2016 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

® IGCSE is the registered trademark of Cambridge International Examinations.

© UCLES 2016

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 (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

Question	Expected answers	Additional guidance	Marks
1 (a) (i)	all boxes completed **;** no colour change in test-tube **B ;** colour change in test-tube **A** at both temperatures **;** more rapid colour change at 35 °C than at 25 °C for test tube **A ;**		[4]
(ii)	use a thermometer **;**	**A** temperature probe	[1]
(iii)	suitable method of heating / add cold water / add ice **;**		[1]
(iv)	to allow yeast / enzyme / contents of test-tube to adjust to temperature / equilibration / **AW ;**		[1]
(v)	in tube **B** enzymes inactive / enzymes denatured / yeast dead / inactive **;** in tube **A** enzymes active / working **;** (in tube **A**) at 35 °C increased enzyme activity **ORA ;**	**A** enzyme becomes active more quickly (at 35 °C) / works faster / closer to optimum temperature	[3]

© Cambridge International Examinations 2016

Question	Expected answers	Additional guidance	Marks
(b)	(prepare) solutions with different pH values / use of buffers / acid and alkali **;** appropriate range of pH values (minimum 3 values) **;** add (buffer) to yeast (suspension) **;** use stated / equal volume(s) of yeast (suspension) / buffer solution / methylene blue **;** kept at stated temperature **;** record time taken for blue colour to disappear / colour change **AW ;**		[max 5]
(c) (i)	time on x-axis and concentration on y-axis, both axes fully labelled **;** linear scale starting at 0 with more than ½ grid used on both axes **;** all points plotted correctly **;** smooth curve through all plotted points **;**		[4]
(ii)	6.2 **;** g per dm^3 **;**	answer consistent with graph	[2]
			[Total 21]

© Cambridge International Examinations 2016

Question	Expected answers	Additional guidance	Marks
2 (a)	all five leaflets shown **+** drawing at least 90 mm wide **;** lower two leaflets smaller than the other three **;** outline drawn with clean lines, serrated margin indicated, no shading **;** pointed tips to the leaflets **;** realistic representation of veins **;**		[5]
(b)	**shape:** laurel elongated / long / oval **;** oak irregular / non-uniform / lobes / indentations / **AW ;** **edge:** laurel smooth **;** oak smooth / **AW ;**		[4]
(c) (i)	appropriate line drawn on Fig. 2.1**;** maximum with of leaf = 18 mm **;**	tolerance 17–19 mm units required for mark	[2]
(ii)	magnification = 18 ÷ 40 / correct formula stated **;** (×) 0.45 **;**	**A** measurement from 2(c)(i)	[2]
			[Total 13]
3 (a) (i)	as cycling speed increases, breathing rate also increases / **AW ;**		[1]
(ii)	1. more energy needed **;** 2. more oxygen needed **;** 3. more carbon dioxide produced **;** 4. (CO_2 removed) at a faster rate **;** 5. correct reference to <u>respiration</u> **;**	**A** uses more energy **A** uses more oxygen **A** lactic acid	[max 3]
(b)	(minute volume =) 27 × 3000 **;** = 81 000 (cm^3) **;**	correct answer only gains 2 marks	[2]
			[Total 6]

© Cambridge International Examinations 2016