



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY

0610/53

Paper 5 Practical Test

October/November 2016

MARK SCHEME

Maximum Mark: 40

Published

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This document consists of **8** printed pages.

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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)

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Question	Answer	Marks	Guidance
1(a)	table with two / three columns and two / three rows and result recorded in each cell of the table; headings for dependant variable volume of oxygen / gas produced with unit in the header only (cm³); headings for the independent variable; correct trend in values (cut potato higher than uncut);	4	
1(b)(i)	calculates rate by dividing by 3; two correct answers to 1 d.p.;	2	
1(b)(ii)	increased / AW;	1	
1(b)(iii)	<i>description</i> greater oxygen production with cut potato / larger surface area; use of data; <i>explanation</i> a greater surface area / more catalase, in contact with the hydrogen peroxide / substrate;	3	

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Question	Answer	Marks	Guidance
1(c)	<i>either</i> (25 cm ³) the volume of gas produced was greater than 10 cm ³ / the 10 cm ³ measuring cylinder did not hold all of the gas produced; <i>or</i> (10 cm ³) the 10 cm ³ measuring cylinder could be read with greater accuracy / precision;	1	
1(d)	total length / diameter / width / volume of potato cylinder; concentration / volume of hydrogen peroxide; time;	2	

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Question	Answer	Marks	Guidance
1(e)	<i>error</i> – loss of gas while connecting the bung; <i>improvement</i> – idea of closed system / three-way tap / doing quickly; <i>error</i> – pieces sticking together reduces surface area; <i>improvement</i> – shake continuously; <i>error</i> – (inconsistent) shaking; <i>improvement</i> – sensible suggestion for regular shaking; <i>error</i> – potato not measured so not cut into equal sized pieces; <i>improvement</i> – measure 5 mm slices; <i>error</i> – dilution of peroxide due to washing; <i>improvement</i> – use a new large test tube each time; <i>error</i> -sticks not from same potato / same variety of potato / different mass / density; <i>improvement</i> – use sticks from the same potato / variety of potato / age of potato / measure mass; <i>error</i> – temperature fluctuation; <i>improvement</i> – water bath; <i>error</i> – only one trial ; <i>improvement</i> – repeat at least 2 more time ; AVP;	4	error must match improvement

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Question	Answer	Marks	Guidance
1(f)	keep (all) variables the same / AW; substitute plant material for inert material e.g. glass beads / leave out potato; idea of collecting gas produced solely by decomposition <u>and</u> subtracting this value / AW;	2	A at least 2 named variables A boiled or dead plant material I no catalase / enzyme unqualified R adding water instead of potato
1(g)	1 use the same size (surface area) of plant; 2 carry out experiment at the same temperature / pH; 3 other variable from previous method; 4 measure volume of oxygen produced; 5 plans to repeat experiment; 6 calculate the mean; 7 comparison of volumes for different food plants; 8 reference to relevant safety feature;	5	A mass A counting bubbles A comparative statement e.g. goggles, gloves, lab coat I general lab safety

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Question	Answer	Marks	Guidance
1(h)	A (xes) – labelled with units, y-axis even scale; S (ize) – occupies at least half the grid; P (lot) – all bars plotted accurately $\pm \frac{1}{2}$ square; B (ars) – ruled lines, have an equal gap between each component and are equal width;	4	
1(i)	add Benedict's solution; heat; red / brown / green / yellow precipitate indicates reducing sugars present;	3	I unqualified water-bath
		Total: 31	

Question	Answer	Marks	Guidance
2(a)(i)	outline – single clear lines with no shading; size – <u>three</u> cells (whole or part) larger than image cells; detail – slight gap between cell wall and vacuole (at least once) / presence of small nucleus; correct proportion, vacuole longer than wide; label vacuole;	5	
2(a)(ii)	MN 35 ± 1 (mm); PQ 70 ± 1 (mm); 100%;	3	

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Question	Answer	Marks	Guidance
2(b)	same shape / longer than wide; all contain a vacuole; all have cell walls; all have dark pigmentation / AW; all have nuclei;	1	
		Total: 9	