



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY

0610/63

Paper 6 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)	<p>table with two/three columns and two/three rows and result recorded in each cell of the table;</p> <p>headings for dependant variable volume of oxygen / gas produced with unit in the header only (cm³);</p> <p>headings for the independent variable;</p> <p>correct values transferred from Fig. 1.3; i.e. 9.6 and 4.8 ± 0.1 cm³</p>	4	
1(b)(i)	1.6; 3.2;	2	ecf
1(b)(ii)	increased / AW;	1	

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Question	Answer	Marks	Guidance
1(b)(iii)	<p><i>description</i> greater oxygen production with cut potato / larger surface area; use of data;</p> <p><i>explanation</i> a greater surface area / more catalase, in contact with the hydrogen peroxide / substrate;</p>	3	
1(c)	the 10 cm ³ measuring cylinder could be read with greater accuracy / precision / AW;	1	
1(d)	total length / diameter / width / volume of potato cylinder; concentration / volume of hydrogen peroxide; time; shaking every 30 seconds / at regular intervals;	2	

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Question	Answer	Marks	Guidance
1(e)	<p><i>error</i>–loss of gas while connecting the bung; <i>improvement</i>–idea of closed system/three-way tap/doing quickly;</p> <p><i>error</i>–pieces sticking together reduces surface area; <i>improvement</i>–shake continuously;</p> <p><i>error</i>–inconsistent shaking; AW <i>improvement</i>–sensible suggestion for regular shaking;</p> <p><i>error</i>–potato not measured so not cut into equal sized pieces; <i>improvement</i>–measure 5 mm slices;</p> <p><i>error</i>–dilution of peroxide due to washing; <i>improvement</i>–use a new large test tube each time;</p> <p><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;</p> <p><i>error</i>–temperature changes/varies; <i>improvement</i>–water bath;</p> <p><i>error</i>–only done once; <i>improvement</i>–repeat at least 2 more times;</p> <p>AVP; e.g. pH, contamination of tubes</p>	4	error must match improvement

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Question	Answer	Marks	Guidance
1(f)	<p>keep (all) variables the same / AW;</p> <p>substitute plant material for inert material e.g. glass beads / leave out potato;</p> <p>idea of collecting gas produced solely by decomposition <u>and</u> subtracting this value / AW;</p>	2	<p>A at least 2 named variables</p> <p>A boiled or dead plant material</p> <p>I no catalase / enzyme unqualified</p> <p>R adding water instead of potato</p>
1(g)	<ol style="list-style-type: none"> 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	<p>A mass</p> <p>A counting bubbles</p> <p>A comparative statement</p> <p>e.g. goggles, gloves, lab coat</p> <p>I general lab safety</p>
1(h)	<p>A(xes) – labelled with units, y-axis even scale;</p> <p>S(ize) – occupies at least half the grid;</p> <p>P(lot) – all bars plotted accurately $\pm \frac{1}{2}$ square;</p> <p>B(ars) – ruled lines, have an equal gap between each component and are equal width;</p>	4	

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Question	Answer	Marks	Guidance
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	