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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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 (cm^3); 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)	*description* greater oxygen production with cut potato / larger surface area; use of data; *explanation* a greater surface area / more catalase, in contact with the hydrogen peroxide / substrate;	**3**	

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Question	Answer	Marks	Guidance
1(c)	*either* (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; *or* (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)	*error* – loss of gas while connecting the bung; *improvement* – idea of closed system / three-way tap / doing quickly; *error* – pieces sticking together reduces surface area; *improvement* – shake continuously; *error* – (inconsistent) shaking; *improvement* – sensible suggestion for regular shaking; *error* – potato not measured so not cut into equal sized pieces; *improvement* – measure 5 mm slices; *error* – dilution of peroxide due to washing; *improvement* – use a new large test tube each time; *error* -sticks not from same potato / same variety of potato / different mass / density; *improvement* – use sticks from the same potato / variety of potato / age of potato / measure mass; *error* – temperature fluctuation; *improvement* – water bath; *error* – only one trial ; *improvement* – 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 and 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 ± ½ 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	

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