**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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**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;<br><br>headings for dependant variable<br>volume of oxygen / gas produced with unit in the header only ($cm^3$);<br><br>headings for the independent variable;<br><br>correct values transferred from Fig. 1.3;<br>i.e. 9.6 and 4.8 ± 0.1 $cm^3$ | **4** | |
| 1(b)(i) | 1.6;<br>3.2; | **2** | ecf |
| 1(b)(ii) | increased / AW; | **1** | |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 1(b)(iii) | *description*<br>greater oxygen production with cut potato / larger surface area;<br>use of data;<br>*explanation*<br>a greater surface area / more catalase, in contact with the hydrogen peroxide / substrate; | **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;<br>concentration / volume of hydrogen peroxide;<br>time;<br>shaking every 30 seconds / at regular intervals; | **2** | |

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

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 1(f) | keep (all) variables the same / AW;<br><br>substitute plant material for inert material e.g. glass beads / leave out potato;<br><br>idea of collecting gas produced solely by decomposition <u>and</u> subtracting this value/ AW; | **2** | **A** at least 2 named variables<br>**A** boiled or dead plant material<br>**I** no catalase / enzyme unqualified<br>**R** adding water instead of potato |
| 1(g) | 1 use the same size (surface area) of plant;<br><br>2 carry out experiment at the same temperature / pH;<br><br>3 other variable from previous method;<br><br>4 measure volume of oxygen produced;<br><br>5 plans to repeat experiment;<br><br>6 calculate the mean;<br><br>7 comparison of volumes for different food plants;<br><br>8 reference to relevant safety feature; | **5** | **A** mass<br><br><br><br><br>**A** counting bubbles<br><br><br><br><br>**A** comparative statement<br><br>e.g. goggles, gloves, lab coat<br><br>**I** general lab safety |
| 1(h) | **A**(xes) – labelled with units, y-axis even scale;<br>**S**(ize) – occupies at least half the grid;<br>**P**(lot) – all bars plotted accurately ± ½ square;<br>**B**(ars) – ruled lines, have an equal gap between each component and are equal width; | **4** | |

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 1(i) | add Benedict's solution;<br>heat;<br>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;<br><br>size – <u>three</u> cells (whole or part) larger than image cells;<br><br>detail -<br>slight gap between cell wall and vacuole (at least once) / presence of small nucleus;<br><br>correct proportion, vacuole longer than wide;<br>label vacuole; | 5 | |
| 2(a)(ii) | **MN** 35 ± 1 (mm);<br><br>**PQ** 70 ± 1 (mm);<br><br>100%; | 3 | |

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

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