**Cambridge International Examinations**
Cambridge International General Certificate of Secondary Education

**BIOLOGY** **0610/52**

Paper 5 Practical Test **March 2017**

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 (where responses vary more than usual)
- 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 word given must be used by candidate (grammatical variants excepted)
- max indicates the maximum number of marks that can be given

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| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 1(a)(i) | **A** floats, **B** (probably) sinks, **C** sinks, **D** float / sink ; | **1** | refer to the Supervisor's report |
| 1(a)(ii) | **1** table drawn with appropriate lines and number of cells **;**<br>**2** column and row headings and appropriate units for each heading **;**<br>**3** correct measurements **;**<br>**4** correct calculations of change in length **;** | **4** | refer to the Supervisor's report<br><br>**R** units in any data cell<br>**A** cm or mm (if data correct) |
| 1(a)(iii) | texture ;<br>rigidity ;<br>transparency;<br>**AVP** ; relating to physical characteristic | **2** | refer to the Supervisor's report |
| 1(b)(i) | *expected:* **B D A C ;;** | **2** | **A** suitable trend matching the candidate's data |
| 1(b)(ii) | **B** gained, water **;**<br>(because **B**) was, hard / larger / AW **;**<br>**C / A**, lost, water **;**<br>**(**because **C**) was most, floppy / soft / small / AW **;**<br>**D / A**, were between **B** and **C** in terms of, length / texture **;**<br>**A**, bent more / smaller than, **D ; ora**<br>no (net) movement of water in **D /** AW **;** | **3** | explanations should match the candidate's data |

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 1(b)(iii) | **1** reuse of syringe **;**<br>**2** use clean / new, syringes each time **;**<br><br>**3** water loss from tubes **;**<br>**4** cover tubes (prevent evaporation) **;**<br><br>**5** potatoes may not be same, type / age / AW **;**<br>**6** use same potato / type of potato etc. **;**<br><br>**7** softness / bending, was not quantified **;**<br>**8** described method to quantify, bending / softness **;**<br><br>**9** AVP;; | **2** | |
| 1(b)(iv) | initial, length / diameter / size / surface area, of potato / type / age / AW, of potato / volume / 25 $cm^3$, of (sucrose) solution / soaking time / temperature **;** | **1** | **I** amount<br>**I** time unqualified |
| 1(c)(i) | *idea that* (mass) change, would be greater / takes a longer time (so easier to measure) **;**<br>allows more time to reach equilibrium **;** | **1** | |
| 1(c)(ii) | surface water would not affect measurement of length **;** | **1** | |
| 1(c)(iii) | **A**xes – correct axes with axes labels and units **;**<br>**S**cale – even scale and points fill more than half of printed grid **;**<br>**P**lotting – plots all accurate ± half a small square **;**<br>**L**ine **;** | **4** | **A** *x*: concentration / g per $dm^3$ OR concentration / g $dm^{-3}$<br>*y*: percent(age) change in mass OR change in mass / %<br><br>**R** extrapolation / feathered line |

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 1(b)(iv) | any indication on graph where their expected line intercepts *x*-axis **;**<br>value from graph in g per $dm^3$ **;** | **2** | |
| 1(b)(v) | potatoes) of different, age / variety / part / AW **;**<br>to calculate an average / identify anomalies **;** | **1** | **I** mass / size, of potato |

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 2(a) | **O** – outline of petals with clear unbroken lines and no shading anywhere **;**<br>**S** – size to fill at least half available space **;**<br>**D** – detail shown**;**<br>**P** – correct proportion **;** | **4** | |
| 2(b)(i) | 15 (mm) ± 1 **;** | **1** | **A** 1.5 cm |
| 2(b)(ii) | (actual length = 15 ÷ 2)<br>7.5 (mm) **;;** | **2** | **A** ecf for measurement |
| 2(c) | **1** at least 3 different temperatures **;**<br>**2** method described to maintain (range of) temperature(s) **;**<br>**3** suitable named time period to count number of seeds germinated **;**<br>**4&5** named controlled variables **;;**<br><br>**6** (method to) maintain water levels **;**<br>**7** at least 3 dishes per temperature / minimum of 5 seeds per dish **;**<br>**8** optimum temperature would have most number of seeds germinated / record at which temperature most seeds germinated / temperature where seeds germinated fastest **;**<br>**9** AVP **;** | **6** | **A** record time for all seeds to germinate<br><br>**A** amount of water **;** amount oxygen **;** humidity **;** species / type / variety, of seed **;** mass / size / age / number, of seed **;** pH **;** (measurement) period **;**<br><br>**A** e.g. cover dishes / repeat watering regularly<br><br>**A** e.g. repeat experiment near the optimum temperature |
| 2(d)(i) | cut / mash / crush, the seed (in water) / AW **;**<br>add iodine solution**;** | **2** | |
| 2(d)(ii) | blue-black colour **;** | **1** | |

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