**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**

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

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This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

**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

| 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** | |