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
<u>underline</u>	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 **;** **2** column and row headings and appropriate units for each heading **;** **3** correct measurements **;** **4** correct calculations of change in length **;**	**4**	refer to the Supervisor's report **R** units in any data cell **A** cm or mm (if data correct)
1(a)(iii)	texture ; rigidity ; transparency; **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 **;** (because **B**) was, hard / larger / AW **;** **C / A**, lost, water **;** **(**because **C**) was most, floppy / soft / small / AW **;** **D / A**, were between **B** and **C** in terms of, length / texture **;** **A**, bent more / smaller than, **D ; ora** 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 **;** **2** use clean / new, syringes each time **;** **3** water loss from tubes **;** **4** cover tubes (prevent evaporation) **;** **5** potatoes may not be same, type / age / AW **;** **6** use same potato / type of potato etc. **;** **7** softness / bending, was not quantified **;** **8** described method to quantify, bending / softness **;** **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 **I** time unqualified
1(c)(i)	*idea that* (mass) change, would be greater / takes a longer time (so easier to measure) **;** 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 **;** **S**cale – even scale and points fill more than half of printed grid **;** **P**lotting – plots all accurate ± half a small square **;** **L**ine **;**	**4**	**A** *x*: concentration / g per dm^3 OR concentration / g dm^{-3} *y*: percent(age) change in mass OR change in mass / % **R** extrapolation / feathered line

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

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