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Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY

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Paper 5 Practical Test

March 2017

MARK SCHEME

Maximum Mark: 40

Published

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

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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

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)	<i>expected:</i> 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)	<i>idea that</i> (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 $\pm$ 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	1 mass / size, of potato

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) $\pm$ 1 ;	1	A 1.5 <u>cm</u>
2(b)(ii)	(actual length = $15 \div 2$) 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	