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Cambridge International General Certificate of Secondary Education

BIOLOGY

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Paper 6 Alternative to Practical

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MARK SCHEME

Maximum Mark: 40

Published

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This document consists of **6** printed pages.

Mark schemes will use these abbreviations

- ; 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)		type of fruit	volume of juice / cm ³	1	Ignore units in table A 13.0, 18.0, 7.0
	1	orange	13		
	2	grapefruit	18		
	3	lemon	7		
1(a)(ii)	table drawn with (ruled) lines, appropriate columns and (heading) underlined ; suitable headings ; all colours recorded for start and end;			3	
1(a)(iii)	Benedict's (reagent) ;			1	
1(a)(iv)	80 °C ;			1	
1(a)(v)	orange and grapefruit ;			1	
1(a)(vi)	idea of looking for colour change (as the starting colour may not be blue) ;			1	
1(b)		<i>variable</i>	<i>controlled by</i>	2	one mark for the variable, one mark for method of controlling which must related
		volume of fruit juice	measuring 2 cm ³ for all		
		volume of Benedict's / solution	measuring 2 cm ³ for all		
		time in water-bath	five minutes in water-bath		
		temperature	thermostatically controlled / maintained water-bath		

Question	Answer		Marks	Guidance
1(c)	error	improvement	4	one mark for error, one mark for improvement which must match
	temperature of water-bath	any method of keeping the temperature the same		
	judging colour by eye	colour standard / colorimeter		
	idea of age of fruit differs	use fruit of the same age / ripeness		
	Benedict's and juice mixed at different times	test each fruit separately / get other people to add solutions		
	no replicates / repeats	at least <u>2</u> more replicates / repeats needed		
	no control	do with no vitamin C / water		
	contamination	wash apparatus		
	no mixing	method of mixing given		
	solids in the juice	Filter		
	**** ****			
1(d)	add biuret ; (blue) to lilac / mauve / purple / violet for positive test ;		2	

Question	Answer	Marks	Guidance
1(e)	<i>any six from:</i> - at least two temperatures / or stated temperatures ; - use of water-bath ; - same volume juice ; - same fruit used ; - same time / stated time ; - add DCPIP ; - measure number of drops of DCPIP ; - control (no vitamin C / water) ; - repeats ; - safety ;	6	A iodine titration method if independent variable is time heated: - stated temperature > 80°C - use of water-bath ; - time intervals (at least two) ; - same volume juice ; - same fruit used ; - add DCPIP ; - measure number of drops of DCPIP ; - control (no vitamin C / water) ; - repeats ; - safety ;
1(f)	O single clear lines with no shading ; S at least 80 mm in diameter ; D1 inner star shape shown ; D2 8–16 segments shown ;	4	

Question	Answer	Marks	Guidance
2(a)(i)	18.4 ;;	2	working $\frac{18 + 17 + 19 + 20 + 18}{5} / \frac{92}{5} = 1 \text{ mark}$
2(a)(ii)	5 circled on Table 2.1 ; 12.8 ;	2	ecf if incorrect result circled A 12.7

Question	Answer	Marks	Guidance
2(a)(iii)	A (xes) – labelled with units ; S (cale) – even scales on both axes; P (lot) – all points plotted accurately $\pm$ half a small square ; L (ines) – line ;	4	
2(a)(iv)	low concentrations increase root growth ; high concentrations decrease root growth ; 0.4% identified as the concentration that produces longest root growth ; correct data quote with units ;	3	ecf for incorrect graph
2(b)	(length of MN) 30 ± 1 mm ; 0.25 mm ;;	3	ecf for incorrect measurement