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Cambridge Ordinary Level

MARK SCHEME for the May/June 2015 series

5090 BIOLOGY

5090/61 Paper 6 (Alternative to Practical), maximum raw mark 40

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Mark schemes will use these abbreviations:

;	separates marking points
/	alternatives
()	contents of brackets are not required but should be implied
R	reject
A	accept (for answers correctly cued by the question, or guidance for examiners)
Ig	ignore (for incorrect but irrelevant responses)
AW	alternative wording (where responses vary more than usual)
AVP	alternative valid point (where a greater than usual variety of responses is expected)
ORA	or reverse argument
underline	actual word underlined must be used by candidate (grammatical variants excepted)
max	indicates the maximum number of marks that can be given
+	statements on both sides of the + are needed for that mark

Question	Expected answers	Additional guidance	Marks
1 (a) (i)	Benedict's (or Fehling's) solution ; heat ; blue **+** green / yellow / orange / red ; reference to use of a water bath / eye protection ;	**R** if add HC*l* / neutralise with NaOH **A** boil / warm accept in (i) or (ii)	[4]
(ii)	biuret reagent ; blue **+** purple / lilac ;	**A** sodium / potassium hydroxide **+** copper(II) sulphate	[2]
(b) (i)	concentration / g per dm^3 | time taken / s 0.0 | 230 0.2 | 200 0.4 | 150 0.6 | 50 0.8 | 30	one mark per column if all numbers correct if units included in table max. 1 if conc. not recorded in ascending or descending order then max. 1	[2]
(ii)	1. concentration on *x*-axis, time on *y*-axis, both axes fully labelled ; 2. suitable scales: linear **+** minimum size specified ; 3. all points plotted correctly ; 4. points neatly joined by ruled lines ;	**A** conc g / dm^3, t / s ± ½ small square (1 mm on grid) **R** if line extrapolated	[4]
(iii)	40 (seconds) ;	accept figure consistent with graph	[1]

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Question	Expected answers	Additional guidance	Marks
(iv)	reference to inverse relationship / as conc. increases time taken decreases ;	**Ig** inversely proportional	[1]
(v)	reference to use of thermometer (to check temperature) ; reference to method of controlling temperature, e.g. adding hot water, use of a water bath, means of heating water ;	**A** use of thermostat to measure temperature / device that is set at particular temperature **Ig** lagging	[2]
(c)	min. 3 pH values used ; reference to use of acid / alkali ; volume of milk / enzyme / concentration of enzyme kept the same ; temperature kept constant ; coagulation time at each pH recorded ; repeat **+** mean ;	 **A** buffers **A** stated volumes, e.g. 10 cm^3 milk **A** stated temperature < 50 °C	[max 4]
			[Total 20]
2 (a)	P and Q only drawn with clear, clean continuous lines and no shading ; cells P and Q drawn to correct scale (approx. 6 cm diameter) ; cell walls indicated by double line ; indication of chloroplasts in cell ;	 tolerance 5 – 7 cm either P or Q must show complete cell wall not more than 8 chloroplasts in one cell	[4]
(b) (i)	increases until 1400 ; to (a maximum of) 25 (g per hour); then decreases ;		[3]
(ii)	(increases by) 23 g per hour ;		[1]

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Question	Expected answers	Additional guidance	Marks
(c)	cobalt chloride / anhydrous copper sulphate ; colour change correctly described ;	 blue to pink for cobalt chloride white to blue for copper sulphate	[2]
			[Total 10]
3 (a) (i)	35 ; mm ;	**A** 34 – 36	[2]
(ii)	(35) ÷ 0.5 / actual = image ÷ magnification ; correct answer with units ;	**A** multiplication by 2 **A** ecf from incorrect measurement in 3(a)(i) 34 = 68 mm / 35 = 70 mm / 36 = 72 mm	[2]
(b) (i)	widths totalled / **AW** ; divided by the number in sample / 10 ;		[2]
(ii)	increase sample size ; repeat with different species ;	**Ig** repeat and calculate mean	[max 1]
(iii)	less light available in shade ; (plants need) increased surface area ; to trap more light ; (for) photosynthesis ;		[max 3]
			[Total 10]

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