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Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the May/June 2015 series

9700 BIOLOGY

9700/35 Paper 3 (Advanced Practical Skills 1), maximum raw mark 40

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Mark scheme abbreviations:

;	separates marking points
/	alternative answers for the same point
R	reject
A	accept (for answers correctly cued by the question, or by extra guidance)
AW	alternative wording (where responses vary more than usual)
underline	actual word given must be used by candidate (grammatical variants accepted)
max	indicates the maximum number of marks that can be given
ora	or reverse argument
mp	marking point (with relevant number)
ecf	error carried forward
I	ignore

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1 **(a)** (level of risk) medium or high ; [1]

(b) **(i)** (labels under correct sequence of beakers) 2.5 **+** 1.25 **+** 0.625 **+** % ;

shows transfer of 20 cm^3 of solution from previous beaker to 2 beakers ;

adds water / **W +** 20 cm^3 to three beakers ; [3]

(ii) **1** table with heading underlined (top or to left of data) **+** percentage concentration of urea / **U** ;

2 table with heading (any column / row headed) **+** time **+** seconds ;

3 records time for at least 4 concentrations **+** lowest concentration of **U** recorded first ;

4 records repeats ;

5 records time in whole seconds ; [5]

(iii) difficult to judge end-point ;

mixing of **U** and **E** not standardized or size of litmus not the same for each test-tube ; [2]

(iv) use of mechanical stirrer **or** use of ruler to measure accurately the size of litmus paper ; [1]

(v) syringe ; [1]

(vi) decrease the temperature **+** use of thermostatically-controlled water-bath ;

decrease concentration of **E +** dilution of **E** ;

decrease volume of **E +** stated volume of **E** (less than 0.5 cm^3) ; [max 2]

(c) **(i)** *orientation*
(*x*-axis) time of sampling (/) minutes **+** (*y*-axis) $^{13}CO_2$ in the breath (/) arbitrary units ;

scale
(*x*-axis) 2 cm to 20 labelled each 2 cm **+** must have 30 at the origin **+** (*y*-axis) 2 cm to 2 labelled each 2 cm **+** must have 10 at the origin ;

plotting
correct plotting of 5 points as small cross / dot in circle ± half a square ;

line
5 plots with ruled lines exactly point to point **+** quality smooth line less than 1 mm thick ; [4]

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(ii) less urea / substrate **+** as urea is broken down ;

fewer enzyme-substrate complexes **+** slower rate of reaction ; [2]

[Total: 21]

2 (a) (i) 1 drawn at least 2 layers of tissue **+** size at least 100 mm **+** no shading ;

2 no cells **+** correct half drawn ;

3 epidermis of bulges drawn as two lines ;

4 draws angular inner region ;

5 correct label with label line ending in the pith ; [5]

(ii) 1 thin and continuous lines **+** size at least 40 mm for at least one cell ;

2 draws only 4 cells **+** 2 cells from epidermis touching **+** 2 cells from cortex touching ;

3 4 cells with walls drawn as double lines ;

4 for at least 2 cells, walls drawn with middle lamella between the cells ;

5 correct label with label line ending at the cell wall ; [5]

(b) (i) shows 0.028 multiplied by 1000 ;

shows answer as 28 μm ; [2]

(ii) shows length of line **X** as eyepiece graticule units within range ;

shows length of **X** multiplied by 28 μm ; [2]

(iii) air spaces **+** *idea of* buoyancy or relatively small amount of xylem as water diffusing through epidermis ; [1]

(c) 1 organises table with 3 columns or rows **+** with appropriate headings **+** one column or row for features ;

2 observable difference between **K1** and Fig. 2.2, e.g. position of vascular tissue ;

3 observable difference between **K1** and Fig. 2.2, e.g. presence of air spaces ;

4 observable difference between **K1** and Fig. 2.2, e.g. presence of pith ; [4]

[Total: 19]

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