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Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the May/June 2015 series

9700 BIOLOGY

9700/34 Paper 3 (Advanced Practical Skills 2), 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) 0.03 + 0.003 + 0.0003 + % ;

shows transfer of 1 cm^3 of solution from previous beaker to 2 beakers ;

adds 9 cm^3 water / **W** to three beakers ; [3]

(ii) **1** table with heading **+** <u>percentage concentration of **X**</u> ;

2 table with heading **+** <u>number</u> **or** <u>no. of bubbles</u> ;

3 records results for **W or** 0% and 4 concentrations ;

4 records lowest concentration of **X** with a higher number of bubbles than highest concentration of **X** ;

5 repeats at least one concentration ; [5]

(iii) whole seconds recorded and shows 2 divided by this value ;

correct answer calculated to correct number of significant figures ; [2]

(iv) *idea of* inhibits activity ;

idea of preventing substrate binding to the enzyme / active site **or** fewer enzyme-substrate complexes formed ; [2]

(v) (counting bubbles) different sizes **or** too fast **or** bubbles group together ;

(displacement of water) gas escapes from delivery tube **or** not all bubbles go into syringe **or** parallax error ; [2]

(vi) (independent variable) use the same concentration of **X** ;

5 or more temperatures ;

use thermostatically-controlled water-bath ; [3]

[Total: 18]

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2 (a) (i) *orientation*
(*x*-axis) length of neck / cm **+** (*y*-axis) thickness of muscle wall in left ventricle / mm ;

scale
(*x*-axis) 2 cm to 10 labelled each 2 cm **+** must have 50 at the origin **+** (*y*-axis) 2cm to 5 labelled each 2 cm, **+** must have 20 at origin ;

plotting correct plotting of 5 points ;

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

(ii) correct estimate from candidate graph; [1]

(iii) *idea of* thicker / stronger / wall or muscle to push blood up longer neck **or** to push the blood further; [1]

(b) (i) 1 correct selection of vessel **Q** or **T** ;

2 size at least 100 mm **+** no shading ;

3 length of drawing is at least twice the size of the narrowest width ;

4 draws at least three lines across wall **+** inner line crinkled ;

5 proportions of vessel walls correct with one selected ; [5]

(ii) 1 shows on Fig. 2.1 where measured **S** ;

2 shows at least 5 of measurements of the diameter **+** 5 measurements of the thickness of the wall ;

3 measures at least 3 for each in whole mm or to ±0.5 mm ;

4 answer shown as larger number to smaller number to lowest common denominator ; [4]

(c) (i) 1 sharp continuous lines **+** size at least 40 mm for at least one cell ;

2 draws only 4 xylem vessels **+** at least 2 touching ;

3 for at least 2 cells, walls drawn as double lines, with middle lamella ;

4 straight line where 2 cells meet **or** at least one cell with at least one angle present ;

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

(ii) *idea that* Fig. 2.1 has thicker walls than the xylem **or** Fig. 2.1 has more than one layer xylem has only one ; [1]

(iii) lumen **+** space / no (cell) contents **or** lumen **+** idea of less resistance ; [1]

[Total: 22]

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