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**Cambridge International Advanced Subsidiary and Advanced Level**

# MARK SCHEME for the October/November 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)** medium or high **;** [1]

**(b)** **(i)** stated volume (2 or 3 or 4 or 5 $cm^3$) **+** use a syringe **+** same volume for each pH solution **;** [1]

**(ii)** mp1 table drawn **+** heading for solution(s) **;**

mp2 heading for colour **;**

mp3 records a colour for all 6 solutions (**pH3**, **pH4**, **pH6**, **W**, **S1** and **S2**) **;**

mp4 records **pH6** as a paler colour (pink, red or purple) than **pH3 ;**

mp5 records a darker or brighter colour (pink, red or purple) for **S2** than for **pH3 or** red for **S2** if **pH3** is pink **;** [5]

**(iii)** correct position of **pH3**, **pH4** and **pH6** on the scale **;**
**W**, **S1** and **S2** in correct positions on scale **;** [2]

**(c)** **(i)** mp1 (*x*-axis) temperature (/) °C **+** (*y*-axis) absorbance (of) light (by) coloured liquid (/) arbitrary units **or** au **;**

mp2 (*x*-axis) 5 to 2 cm labelled each 2 cm origin labelled 20 or 25 **+** (scale for *y*-axis) 0.1 to 2 cm labelled each 2 cm **;**

mp3 correct plotting of 5 points as a small cross or dot in circle **;**

mp4 5 plots **+** ruled sharp lines exactly point to point **;** [4]

**(ii)** shows on graph where reading taken off at 40 °C **;**
correct reading from graph **+** arbitrary units **or** au **;** [2]

**(iii)** as the temperature increases the permeability of the cell surface membranes increases **;**
cell membrane contains) protein **;**
high temperature denatures protein **;** [3]

**(iv)** thermostatically controlled water-bath **;** [1]

**(iv)** 5 or more concentrations of alcohol **or** examples of 5 concentrations **;**
serial dilution **or** simple dilution **or** described **;** [2]

**[Total: 21]**

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**2 (a) (i)** mp1 size at least 90 mm **+** no shading **;**

mp2 no cells **+** at least 3 lines **+** at least 3 enclosed areas drawn (denoting vascular bundles) **+** only half drawn **;**

mp3 draws outline with either 1 bulge or 2 half bulges **;**

mp4 at least 2 lines for epidermis (small space between these lines) **;**

mp5 uses label line **+** label to xylem **;** [5]

**(iii)** pith cells larger **or** pith cells have intercellular spaces **or** pith cells more loosely packed **or** pith cell wall thinner **or** pith cells rounder **ora ;** [1]

**(iii)** mp1 at least 4 cells **+** size at least 40 mm across largest cell **+** sharp continuous lines **;**

mp2 only 4 cells drawn **+** each cell must touch at least one point on 2 other cells **+** no shading **;**

mp3 minimum of one intercellular space between cells **;**

mp4 cell walls drawn as double lines **+** middle lamella between **;**

mp5 uses label line **+** label to cell wall **;** [5]

**(b) (i)** correct measurement of line **A** (19–21 mm) **;**
shows division by 100 **;**
shows multiplication by 1000 or $10^3$ **;** [3]

**(ii)** organised as table with 3 columns or rows headed for feature **+ K1 +** Fig. 2.1 **;**
3 observable differences between Fig.2.1 and Fig. 2. 2 **;;;** [4]

**(iii)** correct ratio as a larger whole number to a smaller whole number to the lowest common denominator **;** [1]

**[Total: 18]**

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