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Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the October/November 2015 series

9700 BIOLOGY

9700/31 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) (i) draws at least 3 additional beakers **;**
shows 4 concentrations of **S**, 1 **+** 0.1**+** 0.01**+** 0.001**+** % **;**
shows transfer of 2 cm^3 solution from previous beaker to next beaker **;**
shows addition of 18 cm^3 of water to each beaker **;** [4]

(ii) states volume **+** cm^3 **+** *ref. to* covering potato **;** [1]

(iii) mp1 table drawn **+** heading for percentage concentration **+ S ;**

mp2 heading for colour **;**

mp3 uses scale (e.g. +++) to record intensity of colour **;**

mp4 result for 10% sodium chloride solution is the highest intensity **+** water is the lowest intensity **;** [4]

(iv) low or medium **;** [1]

(v) to show that the results were due to sodium chloride solution and not any other factor **;** [1]

(vi) *ref. to* other more significant errors than measuring to accuracy of 0.01 cm^3 **;** [1]

(b) (i) mp1 (*x*-axis) time in sodium chloride solution / days
+ (*y*-axis) mean length of roots / mm **;**

mp2 (*x*-axis) 2 cm to 2, labelled each 2 cm, except origin and 10
+ (*y*-axis) 2 cm to 5, labelled each 2 cm, except 55 or 60, with 30 or 35 at origin **;**

mp3 for 1 mM sodium chloride solution, correct plotting of five points as small cross or dot in circle **;**

mp4 for 1 mM sodium chloride solution, five plots **+** ruled sharp lines exactly point to point **;** [4]

(ii) shows 39.5 – 38 divided by 2 **;**
0.75 **;** [2]

(iii) correct *ref. to* water potential **;**
ref. to movement of water entering cells **;** [2]

(iv) uses at least 5 temperatures **;**
(controls temperature by) greenhouse / incubator / temperature controlled room **;**
ref. to how standardisation of other variable carried out **;** [3]

[Total: 23]

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2 (a) (i) mp1 size at least 70 mm **+** no shading **;**

mp2 no cells **+** at least 3 lines **+** correct section drawn **;**

mp3 shows end of the leaf curving inwards **;**

mp4 uses label line **+** label to cuticle / trichome / folding of leaf **;**

mp5 feature annotated (cuticle – reduces water loss by evaporation, trichome and folding – reduces diffusion gradient) **;** [5]

(ii) mp1 at least 4 cells **+** size at least 40mm **+** sharp continuous lines **;**

mp2 4 cells drawn **+** each cell touching at least 2 of the other cells **;**

mp3 cell walls drawn as double lines **+** middle lamella between **;**

mp4 correct proportion of width of cell wall to cell **;**

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

(b) (i) uses label line **+** label '**X**' to xylem tissue **;** [1]

(ii) shows correct number of eyepiece graticule units for line **Y** (40 – 44) **;**
shows multiplication by 12 **;**
shows correct answer **;** [3]

(c) organised as table with 3 columns or rows **+** headed for, feature **+ J1 +** Fig. 2.2 **;**
2 observable differences between **J1** and Fig. 2.2 **;;** [3]

[Total: 17]

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