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Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the May/June 2015 series

9700 BIOLOGY

9700/33 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) starch test **+** iodine solution ; [1]

(ii) reducing sugar test **+** add Benedict's solution **+** heat (80 °C – 100 °C) ; [1]

(iii) table with heading **+** solutions **+** (any column / row headed) **+** observations ;

records results for reducing sugar test and starch test for **S1**, **S2** and **S3** ;

for starch test on **S3** records colour change to blue-black
+ for reducing sugar test on **S2** records colour change from blue to yellow, green, red ; [3]

(iv) completed table identifying mixture of sucrose and glucose as **S2**
+ sodium chloride as **S1 +** starch as **S3** ; [1]

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

(b) (i) completed sentence, inserting leaves **+** plasmolysed ; [1]

(ii) table with heading **+** solutions **+** (any column / row headed) **+** number **+** cells ;

records repeats ;

for **W** records number as 0 or 1 **+** for **S1** records number as 6 or above ; [3]

(iii) *idea of* difficulty judging which cells are plasmolysed ; [1]

(iv) **1** thin and continuous lines **+** size at least 70 mm for at least one cell ;

2 draws one cell for **W** and one cell for **S1 +** cell walls drawn as double lines ;

3 for **S1**, draws cell membrane coming away from cell wall ;

4 correct label with label line to cytoplasm for **W** and **S1** ; [4]

(v) for **S1** or **S3**, osmosis **+** correct direction of water movement ;

for **S1**, water moving out of cell **+** correct reference to water potential ;

for **S3**, *idea of* no net movement of water **or** correct ref. to water potential ; [3]

[Total: 19]

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2 (a) (i) using syringe to fill **or** empty tubes to lines marked on tube ; [1]

(ii) 1 table with heading **+** tubes **+** (any column / row headed) **+** volume **+** cm^3 ;

2 for 4 tubes, volumes for $\mathbf{V_0}$ and volumes for $\mathbf{V_9}$;

3 records number as whole numbers **or** to correct precision ;

4 for processed results ($\mathbf{V_0} - \mathbf{V_9}$), correct calculation of volume of water evaporated ; [4]

(iii) completed table according to candidate's results ; [1]

(iv) using lid without holes **or** no lid ; [1]

(v) increase temperature **+** thermostatically-controlled water-bath
or
increase wind speed **+** fan
or
lower humidity **+** fan **or** use of named water absorber ; ; [2]

(b) *orientation*
(*x*-axis) total circumference of holes (/) mm **+** (*y*-axis) rate of evaporation of water (/) $cm^3\ day^{-1}$;

scale
(*x*-axis) 2 cm to 5 labelled each 2 cm **+** (*y*-axis) 2 cm to 0.2 labelled each 2 cm ;

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

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

(c) 1 draws at least 3 layers of tissue **+** size at least 70 mm **+** no shading ;

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

3 draws at least 4 layers of tissue ;

4 vascular bundle drawn to correct proportions ; [4]

(d) (i) shows 0.024 multiplied by 1000 ;

shows answer as 24 μm ; [2]

(ii) shows length of **Y** as eyepiece graticule divisions within range ;

shows length of **Y** multiplied by 24 **+** μm ; [2]

[Total: 21]

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