

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**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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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9700	33

Mark scheme abbreviations:

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

Page 3	Mark Scheme Cambridge International AS/A Level – May/June 2015	Syllabus 9700	Paper 33
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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]

Page 4	Mark Scheme Cambridge International AS/A Level – May/June 2015	Syllabus 9700	Paper 33
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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 +  $\text{cm}^3$  ;

2 for 4 tubes, volumes for  $V_0$  and volumes for  $V_9$  ;

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

4 for processed results ( $V_0 - V_9$ ), 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 (/)  $\text{cm}^3 \text{ day}^{-1}$  ;

*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  $\pm$  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  $24 \mu\text{m}$  ; [2]

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

shows length of Y multiplied by 24 +  $\mu\text{m}$  ; [2]

**[Total: 21]**