

## CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Subsidiary and Advanced Level

### MARK SCHEME for the October/November 2015 series

#### 9700 BIOLOGY

9700/34

Paper 3 (Advanced Practical Skills 2), maximum raw mark 40

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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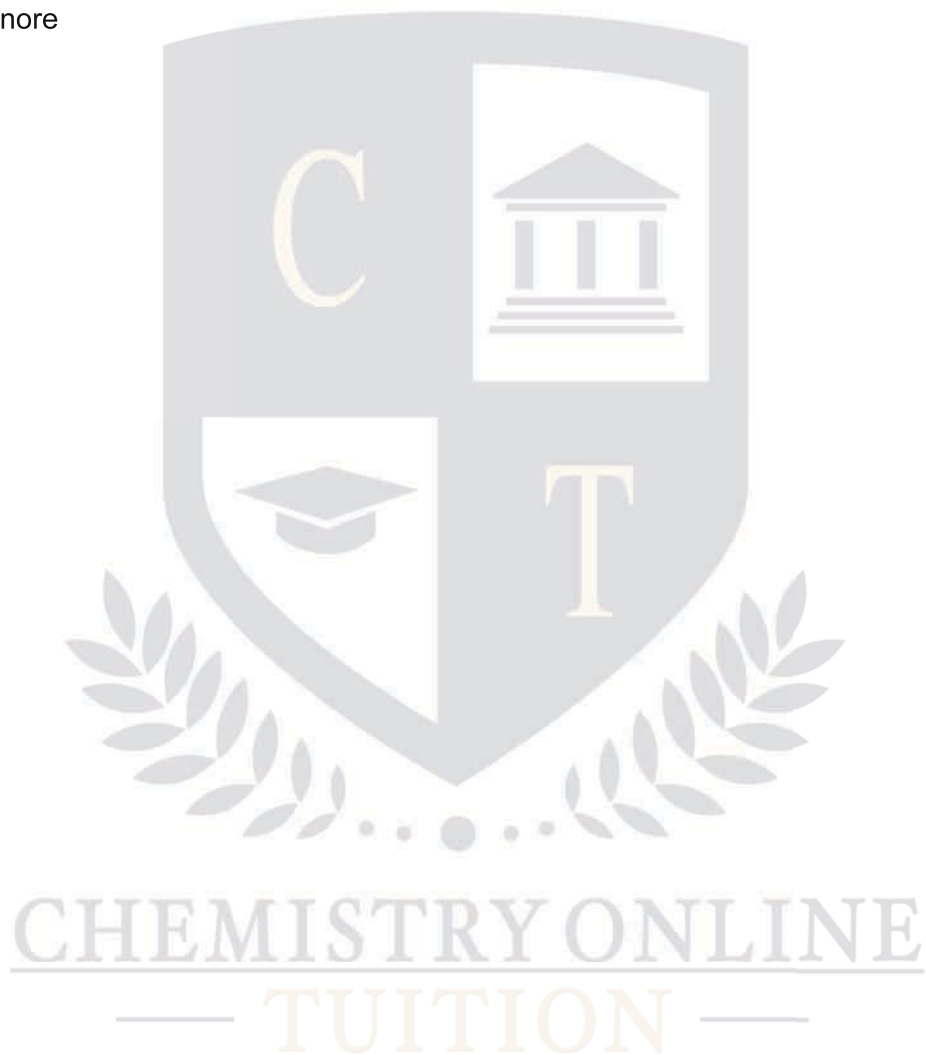
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Mark scheme abbreviations:

;	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



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- 1 (a) low ; [1]
- (b) (i) shows at least 2 more sizes cut using previous size ; [1]
- (ii) (dimension)  $5 \times 5 \times 20$  (surface area) 450 ;  
 dimension)  $5 \times 5 \times 10$  (surface area) 250 + (dimension)  $5 \times 5 \times 5$  (surface area) 150 ; [2]
- (iii) use syringe to measure same volume for all test-tubes **or** mark the level on first test-tube and then use this to mark other test-tubes ; [1]
- (iv) mp1 table drawn + heading for surface area + mm<sup>2</sup> ;  
 mp2 heading for number ;  
 mp3 records values for at least 4 different size pieces ;  
 mp4 records results as whole numbers ;  
 mp5 records the highest surface area as having the highest intensity ;  
 mp6 repeats ; [6]
- (v) random ;  
 correct error described e.g. ends not vertical or *idea of problems cutting the potato to the correct dimensions* ; [2]
- (vi) diffusion ; [1]
- (vii) (standardise surface area) same size / measurements ;  
 (change temperature) 5 temperatures or examples of temperatures ;  
 use a thermostatically controlled water-bath ; [3]

[Total: 17]

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- 2 (a) (i) at least 6 starch grains + size at least 30  $\mu\text{m}$  across the largest starch grain  
+ sharp continuous lines ;  
draws only 6 whole starch grains + no shading ;  
correct shape ;  
shows different sizes ;  
shows correct pattern of lines inside at least 3 starch grains ; [5]
- (ii) L ; [1]
- (iii) *idea of patterns* not visible as iodine stains the starch grains blue/black ; [1]
- (b) (i) circled **only** 16.525 ; [1]
- (ii) correct mean 16.250 ; [1]
- (iii) mp1 (x-axis) type of maize + (y-axis) mean size of starch grains (/)  $\mu\text{m}$  ;  
mp2 (x-axis) even bar widths + equal spaces between bars  
+ (y-axis) 0.5 to 2 cm labelled each 2 cm with origin at 16 ;  
mp3 correct plotting of each bar in order in table + with horizontal line ruled  
within half a square ;  
mp4 clear sharp lines + labelling of bars **D, E, F, G** and **H** ; [4]
- (iv) genetic **or** DNA **or** different enzymes **or** age **or** sample size too small to  
show a valid difference ; [1]
- (c) (i) shows 0.023 multiplied by 1000 or  $10^3$  ;  
23  $\mu\text{m}$  ; [2]
- (ii) correct number of eyepiece graticule units ;  
shows eyepiece graticule units multiplied by the answer to (c)(i) ; [2]
- (d) mp 1 size at least 90 mm + no shading ;  
mp 2 no cells + at least 4 lines + one enclosed area drawn + correct section  
drawn ;  
mp 3 draws vascular bundle inside bulge ;  
mp 4 draws vascular bundle with central enclosed area within an outer enclosed  
area ;  
mp 5 correct label with label line to the vascular bundle ; [5]

[Total: 23]