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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

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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) low **;** [1]

(b) (i) shows at least 2 more sizes cut using previous size **;** [1]

(ii) (dimension) $\underline{5 \times 5 \times 20}$ (surface area) $\underline{450}$ **;**
dimension) $\underline{5 \times 5 \times 10}$ (surface area) $\underline{250}$ **+** (dimension) $\underline{5 \times 5 \times 5}$ (surface area) $\underline{150}$ **;** [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^2 **;**

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 mm 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 (/) μm **;**

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 **;**
23μm **;** [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]

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