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MARK SCHEME for the October/November 2014 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) (i) organised into table with all columns separated by a line + all headings underlined **;**

headings (top or to left of data) sample + (any column / row headed) scale **;**

result for **P1** is a lower number than **P2 ;**

result for **W** is 0 **;** [4]

(ii) U is less concentrated than **P1** and **P2** + **U** is less than 0.8% **;** [1]

(iii) **P1 ;**

U lower scale number than **P1 ;** [2]

(iv) at least four further concentrations of **E** + % **;**

shows transfer of 10 of **P** from previous beaker to three beakers + cm^3 **;**

adds 10 of water to three beakers + cm^3 **;** [3]

(v) records colours + numbers for at least three concentrations **;**

records correct trend for concentrations **;** [2]

(vi) correct estimate of **U ;** [1]

(vii) colorimeter **;** [1]

(b) (i) 1 (*x*-axis) albumin concentration + g per 100 cm^3
(*y*-axis) frequency + number of people **;**

2 (*x*-axis) bars of equal width
(*y* axis) 2 cm to 10 number of people labelled each 2 cm except origin and 60 **;**

3 correct plotting of bars in order of the table **;**

4 six bars + ruled sharp vertical and horizontal lines **;** [4]

(ii) people with different health or sex or age or metabolism **;** [1]

(iii) albumin slows blood circulation or causes osmotic or kidney problems **;** [1]

[Total 20]

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2 (a) (i) 1 at least three lines + size at least 40 mm at widest point + no shading ;

2 no cells drawn + one curved end ;

3 epidermis drawn as two lines ;

4 at least two vascular bundles drawn ;

5 label + line to palisade layer ; [5]

(ii) 1 at least four whole cells + largest epidermal cell at least 40 mm at widest point + sharp continuous outer lines ;

2 at least one epidermal cell + at least three cells for trichome ;

3 cell walls as double line with middle lamella between ;

4 line to nucleus ; [4]

(b) (i) 1 organise as a table with 3 columns + two columns headed **L1** and **L2** + one column with at least one feature ;

	(feature)	L1	Fig 2.2
2	trichome	has trichomes on both surfaces	trichomes on one surface ;
3	folds	no folds / absent / no / (*only*) 1–3 / less / fewer	has fold / present / yes ;
4	vascular bundles number	less / few(er)	more / many ;
5	vascular bundles position	not in folds / only in midrib	one in each fold ;
6	xylem	small(er)	large(r) ;
7	air spaces or packing of cells	large / many / present or cells loosely packed	smaller / fewer / absent or cells densely packed ;
8	cuticle	thick(er) / thin(ner)	thick(er) / thin(ner) ;

[max 4]

(ii) 1 measure scale bar + line + units ;

2 566 divided by measurement of scale bar or length of line divided by length of scale bar or length of scale bar divided by 566 ;

3 measurement of line multiplied by answer to mp2 or answer to mp2 multiplied by 566 or length of line divided by answer to mp2 ;

4 rounds answer to no more than correct decimal places ; [4]

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(iii) measures at least 5 folds **;**

converts to actual length **;** [2]

(iv) folded leaf retains humidity or cuticle prevents transpiration **;** [1]

[Total: 20]

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