## MARK SCHEME for the May/June 2014 series

## 9700 BIOLOGY

9700/33

Paper 33 (Advanced Practical Skills 1), 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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.



Page 2	Mark Scheme	Syllabus	Paper
	GCE AS/A LEVEL – May/June 2014	9700	33

Mark scheme abbreviations:

separates marking points alternative answers for the same point reject accept (for answers correctly cued by the question, or by extra guidance) alternative wording (where responses vary more than usual) actual word given must be used by candidate (grammatical variants accepted) indicates the maximum number of marks that can be given or reverse argument marking point (with relevant number) error carried forward

<ul> <li>(a) (i) records volume of H as whole number (or to 0.5) + cm<sup>3</sup>; [1]</li> <li>(ii) records length of time as every 2 minutes, e.g. 2, 4, 6, 8 + 10 minutes; [1]</li> <li>(iii) source of error end of delivery tube different level in each test-tube or time to transfer delivery tube ifferent each time or loss of CO<sub>2</sub> from delivery tube; (description mark delivery tube or test-tube or keep clock running, record time delivery tube in C or seal end of delivery tube during transfer; [max 2]</li> <li>(iv) organised into table all columns separated by a line + all headings underlined ; headings (top or to left of data) time / minutes + (any column / row headed) volume of H hydrochloric acid / HC/1 / cm<sup>2</sup>; collects readings for at least 4 volumes; records all volumes less than volume recorded in (a)(i); all results to no more than one decimal place;</li> <li>(v) difficult judging colour of end-point (blue / cloudy yellow) or mixing H and C varies for each test-tube; [1]</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler or syringe or ruler + results not accurate + not true value; [1]</li> <li>(vi) (x-axis) even bar widths (R + T) up to 1 cm + (y-axis) labelled mean leaf area / cm plant<sup>-1</sup> x 103 + scale (zero at origin) 1.0 to 2 cm, labelled every 2 cm ; correct plotting of each bar, in the order in the table, with horizontal, ruled sharp line; (bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly labelled with clear labels (R and T); labels must be directly below bars or inside bars or shaded with key [2]</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases ; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> or mean leaf area of plant T increased less between 380 and 719 than R; [max 2]</li> <li>(iii) the higher leaf area for R the more transport ; increased transpiration or translocation ; [2]</li> <li>(c) at least 2 lines for upper epidermis and 2 lines f</li></ul>	Page 3		Mark Scheme GCE AS/A LEVEL – May/June 2014	Syllabus 9700	Paper 33
<ul> <li>(ii) records length of time as every 2 minutes, e.g. 2, 4, 6, 8 + 10 minutes;</li> <li>(iii) source of error end of delivery tube different level in each test-tube or time to transfer delivery tube different each time or loss of CQ<sub>2</sub> from delivery tube different each time or loss of CQ<sub>2</sub> from delivery tube different each time or keep clock running, record time delivery tube in C or seal end of delivery tube during transfer;</li> <li>(iv) organised into table all columns separated by a line + all headings underlined; headings (top or to left of data) time / minutes + (any column / row headed) volume of H hydrochloric acid / HC/ (m<sup>3</sup>; collects readings for at least 4 volumes; records all volumes less than volume recorded in (a)(i); all results to no more than one decimal place;</li> <li>(v) difficult judging colour of end-point (blue / cloudy yellow) or mixing H and C varies fo each test-tube;</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler or syringe or ruler + results not accurate + not true value;</li> <li>(max 1)</li> <li>(vi) (x-axis) even bar widths (R + T) up to 1 cm + (y-axis) labelled mean leaf area / cm plant<sup>-1</sup> x 103 + scale (zero at origin) 1.0 to 2 cm, labelled every 2 cm; correct plotting of each bar, in the order in the table, with horizontal, ruled sharp line; (bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly labelled with clear labels (R and T); labels must be directly below bars or inside bars or shaded with key</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases ; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> or mean leaf area of plant T increased less between 380 and 719 than R; [max 2</li> <li>(iii) the higher leaf area for R the more transport; increased transpiration or translocation;</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for de</li></ul>	(a) (i)		· •	9700	
<ul> <li>(iii) source of error end of delivery tube different level in each test-tube or time to transfer delivery tube different each time or loss of CQ<sub>2</sub> from delivery tube; description mark delivery tube or test-tube or keep clock running, record time delivery tube in C or seal end of delivery tube during transfer; (iv) organised into table all columns separated by a line + all headings underlined; headings (top or to left of data) time / minutes + (any column / row headed) volume of H hydrochloric acid / HC/ / cm<sup>2</sup>; collects readings for at least 4 volumes; records all volumes less than volume recorded in (a)(i); all results to no more than one decimal place; (v) difficult judging colour of end-point (blue / cloudy yellow) or mixing H and C varies for each test-tube; (vi) syringe or ruler + no effect + if use same syringe or ruler or syringe or ruler + no effect + if use same syringe or ruler or correct plotting of each bar, in the order in the table, with horizontal, ruled sharp line; (bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly labeled with clear labels (R and T); labeled must be directly below bars or inside bars or shaded with key (ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> increases the leaf area increases; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> or mean leaf area of plant T increased less between 380 and 719 than R; [max 2 (iii) the higher leaf area for R the more transport ; increased transpiration or translocation ; (c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for depth of midrib + no shading ; no cells + one enclosed area (vascular bundle); correct proportion of vascular bundle in relation to distribution of tissues in midrib ; uses label line and label to vascul</li></ul>					_
<ul> <li>end of delivery tube different level in each test-tube</li> <li>or time to transfer delivery tube different each time</li> <li>or loss of QQ from delivery tube;</li> <li>description</li> <li>mark delivery tube or test-tube</li> <li>or keep clock running, record time delivery tube in C</li> <li>or seal end of delivery tube during transfer;</li> <li>(iv) organised into table all columns separated by a line + all headings underlined;</li> <li>headings (top or to left of data) time / minutes + (any column / row headed) volume of H</li> <li>hydrochloric acid / HCI / cm<sup>3</sup>;</li> <li>collects readings for at least 4 volumes;</li> <li>records all volumes less than volume recorded in (a)(i);</li> <li>all results to no more than one decimal place;</li> <li>(v) difficult judging colour of end-point (blue / cloudy yellow) or mixing H and C varies for</li> <li>each test-tube;</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>or</li> <li>or year at a volumes less than volume recorded every 2cm;</li> <li>(vi) syringe or ruler + ne effect + no true value;</li> <li>(max 1</li> <li>(b) (i) (x-axis) even bar widths (R + T) up to 1 cm + (y-axis) labelled mean leaf area / cm</li> <li>plant<sup>-1</sup> × 103 + scale (zero at origin) 1.0 to 2cm, labelled every 2cm;</li> <li>correct plotting of each bar, in the order in the table, with horizontal, ruled sharp line;</li> <li>(bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly labeled with clear labels (R and T);</li> <li>labels must be directly below bars or inside bars or shaded with key</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases;</li> <li>quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub></li> <li>or</li> <li>mean leaf area of plant T increased less between 380 and 719 than R;</li> <li>(max 2</li> <li>(iii) the higher leaf area for R the more transport;</li> <li>increased transpiration or translocation;</li></ul>	(ii)	reco	records length of time as every 2 minutes, e.g. 2, 4, 6, 8 + 10 minutes ;		[1]
<ul> <li>mark delivery tube or test-tube</li> <li>or keep clock running, record time delivery tube in C</li> <li>or seal end of delivery tube during transfer; [max 2</li> <li>(iv) organised into table all columns separated by a line + all headings underlined;</li> <li>headings (top or to left of data) time / minutes + (any column / row headed) volume of H</li> <li>hydrochloric acid / HCL/ cm<sup>3</sup>;</li> <li>collects readings for at least 4 volumes;</li> <li>records all volumes less than volume recorded in (a)(i);</li> <li>all results to no more than one decimal place;</li> <li>(v) difficult judging colour of end-point (blue / cloudy yellow) or mixing H and C varies for</li> <li>each test-tube;</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>or</li> <li>syringe or ruler + results not accurate + not true value;</li> <li>(max 1</li> <li>(b) (i) (x-axis) even bar widths (R + T) up to 1 cm + (y-axis) labelled mean leaf area / cm</li> <li>plant<sup>-1</sup> × 103 + scale (zero at origin) 1.0 to 2 cm, labelled every 2 cm;</li> <li>correct plotting of each bar, in the order in the table, with horizontal, ruled sharp line;</li> <li>(bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly labelled with clear labels (R and T);</li> <li>labels must be directly below bars or inside bars or shaded with key</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases;</li> <li>quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> increases the leaf area increases;</li> <li>(iii) the higher leaf area for R the more transport;</li> <li>increased transpiration or translocation;</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis</li> <li>+ one enclosed area + size at least 80 mm for depth of midrib + no shading;</li> <li>no cells + one enclosed area (vascular bundle);</li> <li>correct proportion of vascular bundle in relation to distribution of tissues in midri</li></ul>	(iii)	end <b>or</b> ti	of delivery tube different level in each test-tube me to transfer delivery tube different each time		
<ul> <li>or keep clock running, record time delivery tube in C</li> <li>or seal end of delivery tube during transfer;</li> <li>[max 2</li> <li>(iv) organised into table all columns separated by a line + all headings underlined; headings (top or to left of data) time / minutes + (any column / row headed) volume of H hydrochloric acid / HCL / cm<sup>3</sup>; collects readings for at least 4 volumes; records all volumes less than volume recorded in (a)(i); all results to no more than one decimal place;</li> <li>(v) difficult judging colour of end-point (blue / cloudy yellow) or mixing H and C varies for each test-tube;</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler or syringe or ruler + results not accurate + not true value;</li> <li>(max 1</li> <li>(b) (i) (x-axis) even bar widths (R + T) up to 1 cm + (y-axis) labelled mean leaf area / cm plant<sup>-1</sup> × 103 + scale (zero at origin) 1.0 to 2 cm, labelled every 2 cm; correct plotting of each bar, in the order in the table, with horizontal, ruled sharp line; (bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly labelled must be directly below bars or inside bars or shaded with key</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> increases the leaf area increases; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> increases the leaf area increases; (iii) the higher leaf area for R the more transport; increased transpiration or translocation;</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for depth of midrib + no shading; no cells + one enclosed area (vascular bundle); correct proportion of vascular bundle in relation to distribution of tissues in midrib; uses label line and label to vascular bundle;</li> </ul>			•		
<ul> <li>(iv) organised into table all columns separated by a line + all headings underlined; headings (top or to left of data) time / minutes + (any column / row headed) volume of H hydrochloric acid / HCl / cm<sup>3</sup>; collects readings for at least 4 volumes; records all volumes less than volume recorded in (a)(i); all results to no more than one decimal place; [5]</li> <li>(v) difficult judging colour of end-point (blue / cloudy yellow) or mixing H and C varies for each test-tube; [7]</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler or syringe or ruler + results not accurate + not true value; [7]</li> <li>(b) (i) (<i>x</i>-axis) even bar widths (R + T) up to 1 cm + (<i>y</i>-axis) labelled mean leaf area / cm plant<sup>-1</sup> × 103 + scale (zero at origin) 1.0 to 2 cm, labelled every 2 cm; correct plotting of each bar, in the order in the table, with horizontal, ruled sharp line; (bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly labelled with clear labels (R and T); labels must be directly below bars or inside bars or shaded with key [3]</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> increased less between 380 and 719 than R; [max 2]</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for depth of midrib + no shading; no cells + one enclosed area (vascular bundle); correct proportion of vascular bundle in relation to distribution of tissues in midrib; uses label line and label to vascular bundle i; [4]</li> </ul>			•		
<ul> <li>headings (top or to left of data) time / minutes + (any column / row headed) volume of H hydrochloric acid / HC1 / cm<sup>3</sup>; collects readings for at least 4 volumes ; records all volumes less than volume recorded in (a)(i); all results to no more than one decimal place; [5]</li> <li>(v) difficult judging colour of end-point (blue / cloudy yellow) or mixing H and C varies for each test-tube; [7]</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler or syringe or ruler + results not accurate + not true value; [7]</li> <li>(b) (i) (x-axis) even bar widths (R + T) up to 1 cm + (y-axis) labelled mean leaf area / cm plant<sup>-1</sup> × 103 + scale (zero at origin) 1.0 to 2 cm, labelled every 2 cm; correct plotting of each bar, in the order in the table, with horizontal, ruled sharp line; labelled with clear labels (R and T); labels must be directly below bars or inside bars or shaded with key [3]</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> or mean leaf area of plant T increased less between 380 and 719 than R; [max 2]</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area (vascular bundle); correct proportion of vascular bundle in relation to distribution of tissues in midrib; uses label line and label to vascular bundle; [4]</li> </ul>		or s	eal end of delivery tube during transfer;		[max 2]
<ul> <li>all results to no more than one decimal place;</li> <li>(v) difficult judging colour of end-point (blue / cloudy yellow) or mixing H and C varies for each test-tube;</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler or syringe or ruler + no effect + if use same syringe or ruler;</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler</li> <li>(vi) (i) (x-axis) even bar widths (R + T) up to 1 cm + (y-axis) labelled mean leaf area / cm plant<sup>-1</sup> × 103 + scale (zero at origin) 1.0 to 2 cm, labelled every 2 cm ;</li> <li>(b) (i) (x-axis) even bar widths (R + T) up to 1 cm + (y-axis) labelled mean leaf area / cm plant<sup>-1</sup> × 103 + scale (zero at origin) 1.0 to 2 cm, labelled every 2 cm ;</li> <li>(bars) quality of vertical lines, ruled, sharp lines that meet horizontal, ruled sharp line ;</li> <li>(bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly labelled with clear labels (R and T);</li> <li>(bars) quality be directly below bars or inside bars or shaded with key</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases ;</li> <li>(iii) (for R + T) as concentration of CO<sub>2</sub> increases between 380 and 719 t</li></ul>	(iv)	hea hyd colle	dings (top or to left of data) time / minutes + (any colun rochloric acid / HC1/ cm <sup>3</sup> ; ects readings for at least 4 volumes ;	-	
<ul> <li>each test-tube; [1]</li> <li>(vi) syringe or ruler + no effect + if use same syringe or ruler or syringe or ruler + results not accurate + not true value; [max 1]</li> <li>(b) (i) (x-axis) even bar widths (R + T) up to 1 cm + (y-axis) labelled mean leaf area / cm plant<sup>-1</sup> × 103 + scale (zero at origin) 1.0 to 2 cm, labelled every 2 cm; correct plotting of each bar, in the order in the table, with horizontal, ruled sharp line; (bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly labelled with clear labels (R and T); labels must be directly below bars or inside bars or shaded with key [3]</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> or mean leaf area of plant T increased less between 380 and 719 than R; [max 2]</li> <li>(iii) the higher leaf area for R the more transport; increased transpiration or translocation; [2]</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for depth of midrib + no shading; no cells + one enclosed area (vascular bundle); correct proportion of vascular bundle in relation to distribution of tissues in midrib; uses label line and label to vascular bundle ;</li> </ul>					[5]
<ul> <li>or syringe or ruler + results not accurate + not true value ; [max 1]</li> <li>(b) (i) (x-axis) even bar widths (R + T) up to 1 cm + (y-axis) labelled mean leaf area / cm plant<sup>-1</sup> × 103 + scale (zero at origin) 1.0 to 2 cm, labelled every 2 cm ; correct plotting of each bar, in the order in the table, with horizontal, ruled sharp line ; (bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly labelled with clear labels (R and T) ; labels must be directly below bars or inside bars or shaded with key [3]</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases ; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> or mean leaf area of plant T increased less between 380 and 719 than R; [max 2]</li> <li>(iii) the higher leaf area for R the more transport ; increased transpiration or translocation ; [2]</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for depth of midrib + no shading ; no cells + one enclosed area (vascular bundle); correct proportion of vascular bundle in relation to distribution of tissues in midrib ; uses label line and label to vascular bundle ; [4]</li> </ul>	(v)			or mixing <b>H</b> and	l <b>C</b> varies for [1]
<ul> <li>syringe or ruler + results not accurate + not true value ; [max 1</li> <li>(b) (i) (x-axis) even bar widths (R + T) up to 1 cm + (y-axis) labelled mean leaf area / cm plant<sup>-1</sup> × 103 + scale (zero at origin) 1.0 to 2 cm, labelled every 2 cm ; correct plotting of each bar, in the order in the table, with horizontal, ruled sharp line ; (bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly labelled with clear labels (R and T) ; labels must be directly below bars or inside bars or shaded with key [3]</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases ; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> or mean leaf area of plant T increased less between 380 and 719 than R ; [max 2]</li> <li>(iii) the higher leaf area for R the more transport ; increased transpiration or translocation ; [2]</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for depth of midrib + no shading ; no cells + one enclosed area (vascular bundle); correct proportion of vascular bundle in relation to distribution of tissues in midrib ; uses label line and label to vascular bundle ; [4]</li> </ul>	(vi)	syrii	nge or ruler + no effect + if use same syringe or ruler		
plant <sup>-1</sup> × 103 + scale (zero at origin) 1.0 to 2 cm, labelled every 2 cm ; correct plotting of each bar, in the order in the table, with horizontal, ruled sharp line ; (bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly is labelled with clear labels (R and T) ; labels must be directly below bars or inside bars or shaded with key [3] (ii) (for R + T) as concentration of $\underline{CO}_2$ increases the leaf area increases ; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of $\underline{CO}_2$ or mean leaf area of plant T increased less between 380 and 719 than R ; [max 2] (iii) the higher leaf area for R the more transport ; increased transpiration or translocation ; [2] (c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for depth of midrib + no shading ; no cells + one enclosed area (vascular bundle) ; correct proportion of vascular bundle in relation to distribution of tissues in midrib ; uses label line and label to vascular bundle ; [4]			nge or ruler + results not accurate + not true value ;		[max 1]
<ul> <li>(bars) quality of vertical lines, ruled, sharp lines that meet horizontal line exactly labelled with clear labels (R and T); labels must be directly below bars or inside bars or shaded with key</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> or mean leaf area of plant T increased less between 380 and 719 than R; [max 2</li> <li>(iii) the higher leaf area for R the more transport; increased transpiration or translocation; [2</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for depth of midrib + no shading; no cells + one enclosed area (vascular bundle); correct proportion of vascular bundle in relation to distribution of tissues in midrib; uses label line and label to vascular bundle ; [4]</li> </ul>	(b) (i)				af area / cm²
<ul> <li>labelled with clear labels (R and T);</li> <li>labels must be directly below bars or inside bars or shaded with key</li> <li>(ii) (for R + T) as concentration of CO<sub>2</sub> increases the leaf area increases; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> or mean leaf area of plant T increased less between 380 and 719 than R; [max 2</li> <li>(iii) the higher leaf area for R the more transport; increased transpiration or translocation; [2</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for depth of midrib + no shading; no cells + one enclosed area (vascular bundle); correct proportion of vascular bundle in relation to distribution of tissues in midrib; uses label line and label to vascular bundle ; [4</li> </ul>		corr	ect plotting of each bar, in the order in the table, with h	orizontal, ruled sł	narp line ;
<ul> <li>(ii) (for R + T) as concentration of <u>CO<sub>2</sub></u> increases the <u>leaf area</u> increases; quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub> or mean leaf area of plant T increased less between 380 and 719 than R; [max 2</li> <li>(iii) the higher leaf area for R the more transport; increased transpiration or translocation; [2</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for depth of midrib + no shading; no cells + one enclosed area (vascular bundle); correct proportion of vascular bundle in relation to distribution of tissues in midrib ; uses label line and label to vascular bundle ; [4</li> </ul>		labe	elled with clear labels ( <b>R</b> and <b>T</b> ) ;		ine exactly +
<ul> <li>quoted figures to support idea that plant R has greater mean leaf area than plant T a highest concentration of CO<sub>2</sub></li> <li>or mean leaf area of plant T increased less between 380 and 719 than R; [max 2</li> <li>(iii) the higher leaf area for R the more transport; increased transpiration or translocation; [2</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for depth of midrib + no shading; no cells + one enclosed area (vascular bundle); correct proportion of vascular bundle in relation to distribution of tissues in midrib; uses label line and label to vascular bundle ; [4</li> </ul>		labe	els must be directly below bars or inside bars or shaded	d with key	[3]
<ul> <li>(iii) the higher leaf area for R the more transport; increased transpiration or translocation;</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis + one enclosed area + size at least 80 mm for depth of midrib + no shading; no cells + one enclosed area (vascular bundle); correct proportion of vascular bundle in relation to distribution of tissues in midrib; uses label line and label to vascular bundle ;</li> </ul>	(ii)	quo high	ted figures to support idea that plant <b>R</b> has greater n		an plant <b>T</b> at
<ul> <li>increased transpiration or translocation;</li> <li>(c) at least 2 lines for upper epidermis and 2 lines for lower epidermis</li> <li>+ one enclosed area + size at least 80 mm for depth of midrib + no shading;</li> <li>no cells + one enclosed area (vascular bundle);</li> <li>correct proportion of vascular bundle in relation to distribution of tissues in midrib;</li> <li>uses label line and label to vascular bundle;</li> </ul>		mea	an leaf area of plant <b>T</b> increased less between 380 and	719 than <b>R</b> ;	[max 2]
+ one enclosed area + size at least 80 mm for depth of midrib + no shading ; no cells + one enclosed area (vascular bundle) ; correct proportion of vascular bundle in relation to distribution of tissues in midrib ; uses label line and label to vascular bundle ; [4]	(iii)		•		[2]
+ one enclosed area + size at least 80 mm for depth of midrib + no shading ; no cells + one enclosed area (vascular bundle) ; correct proportion of vascular bundle in relation to distribution of tissues in midrib ; uses label line and label to vascular bundle ; [4]					
correct proportion of vascular bundle in relation to distribution of tissues in midrib ; uses label line and label to vascular bundle ; [4	• •				
	со	rrect p	proportion of vascular bundle in relation to distribution of	of tissues in midril	ວ; [4]
					[Total: 22]

	Page 4		Mark Scheme	Syllabus	Paper
			GCE AS/A LEVEL – May/June 2014	9700	33
2	(a) (i)	at least 9 separate cells in total drawn in boxes <b>S1</b> , <b>S2</b> and <b>S3 +</b> size at least 10 mm across largest cell, in any box ; from 2 to 6 whole cells (not overlapping) drawn in each of the boxes <b>S1</b> , <b>S2</b> and <b>S3</b> ; drawn only 3 cells in each of the three boxes ; at least one colour stated for each of the cells in the boxes <b>S1</b> , <b>S2</b> and <b>S3</b> ; [4]			
	(ii)	S2 -	- 100 (°C) - 45 (°C) - 80 (°C) ;		[1]
	(iii)	yeast cells blue + therefore inactive or dead ;			[1]
	(iv)				
			<u>nt</u> dead / blue yeast cells (from sample of yeast cells) ; s graph to find unknown temperature ;		
	(b) (i)		ast 4 whole cells + no shading + size at least 20mm a p and continuous outer line ;	cross cell with g	reatest width +
	(ii)	at le at le uses five show	five whole cells ; ast 2 cells with inclusions ; ast 2 cells with buds ; s label line and label to nucleus or cytoplasm ; (measurements) between (9mm to 15mm) + to 0.5mm ws addition of measurements + shows division by num		[5] nents ;
			w division by 1200 ; ws conversion of mm to $\mu m$ as $ imes$ 1000 + units ;		[4]
					[Total: 18]