MNN. \* Fremer abers con

#### **CAMBRIDGE INTERNATIONAL EXAMINATIONS**

GCE Advanced Subsidiary Level and GCE Advanced Level

# MARK SCHEME for the May/June 2014 series

# 9700 BIOLOGY

9700/32

Paper 32 (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.

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	32

#### 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)

<u>underline</u> 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

Page 3	Mark Scheme	Syllabus	Paper
	GCE AS/A LEVEL – May/June 2014	9700	32

(a) (i) (labels under correct sequence of beakers) + 10 + 5 + 2.5 + %; 1 adds previous concentration of **C** to each of the last two beakers + 10cm<sup>3</sup>; adds water/W + 10 cm<sup>3</sup> to three beakers; [3] (ii) organised into table + all columns separated by a line + all headings underlined; headings (top or to left of data) percentage concentration + (any column/row headed) time (/)s or seconds; whole seconds for at least three concentrations; records highest concentration first; highest concentration recorded in shorter time than next concentration; [5] (iii) (dependent) stage 3 or end-point + idea of judging / determining; [1] (iv) syringe or thermometer + no effect + if use same syringe or thermometer; [max 1] syringes + affect accuracy + not true value; [1] (v) replaces calcium chloride/C with water; (b) (i) calcium chloride + optimum % conc. of calcium chloride from investigation or stated figure % e.g. 20%; type of milk or volume of milk + same milk or same volume or stated volume e.g. 2 cm<sup>3</sup>; temperature of water-bath + use 70 °C maintained by thermostatically controlled water-bath

or

temperature of milk (reaching desired temperature)

+ check temperature of milk has reached 70 °C or milk (has reached) 70 °C (before enzyme added);

volume of enzyme

+ use same volume of E or stated volume e.g. 1 cm<sup>3</sup> of E

or

concentration of enzyme/E

+ use same conc. of E or 1% E;

[max 2]

	Page 4		Mark Scheme	Syllabus	Paper
			GCE AS/A LEVEL – May/June 2014	9700	32
	<ul><li>(ii) (x-axis) time of heating solution E/seconds</li><li>+ (y-axis) time to reach the end-point/seconds;</li></ul>				
		(x-axis) 2 cm to 50 seconds, labelled each 2 cm, except origin and 300 seconds + (y-axis) 2 cm to 50 seconds, labelled each 2 cm, except origin and 250;			
		correct plotting of five points as small cross or dot in circle or cross;			
			plots + ruled sharp lines exactly point to point		
		<b>or</b> ruled	d line of best fit + sharp smooth line;		[4]
		` '	cture of protein/substrate/enzyme/active site or bonds anged/altered/destroyed/no longer complementary/b		
		fewe	er ESCs/Enzyme Substrate Complexes or less substra	ite can <u>bind</u> ;	
		idea	of enzyme denatured;		[3]
					[Total: 20]
2	(a)	at least 3 lines + size at least 40 mm across greatest width of root tip + no shading; no cells + one closed end with one open end; root cap as separate area or two lines around margin; chooses (correct) area to cells undergoing mitosis; label (e.g. mitosis) to area with cells undergoing mitosis; [5]			
	(b)	b) at least 5 cells + size at least 50 mm across largest cell at widest point + sharp continuous lines; only 5 whole cells drawn + enclosure drawn in cells Q and S; for cells P, R and T whole nuclei drawn as different shapes; for Q chromosomes drawn as a mass; 2 labels + 2 lines + 2 different stages of mitosis identified; one correct annotation of one stage;		(6 <u>)</u>	
	(c)	measure	es scale bar within range + mm + to 0.5 ; (range 13–15	mm);	
		shows co	onversion of scale bar in mm to $\mu m$ (× 1000)		
		_	onversion of 31 $\mu$ m to mm (31 divided by 1000 = 0.031	mm);	
		show me	easurement of scale bar in $\mu m$ divided by 31 $\mu m$		
		-	neasurement of scale bar in mm divided by 0.031 mm;		
		correct a	nnswer 451.61/correct answer rounded to a whole num	nber (452) ; <b>ecf</b>	[4]

Page 5	Mark Scheme	Syllabus	Paper
	GCE AS/A LEVEL – May/June 2014	9700	32

## (d) organise as table with 3 columns headed feature + Fig. 2.1 + Fig. 2.2;

[5]

### max 4 for differences

point of comparison	Fig 2.1	Fig 2.2
cells undergoing mitosis	more	few(er)
visibility of chromosomes	chromosome/chromatids visible	chromosome/chromatids not visible;
metaphase or anaphase	present/ (one cell in) metaphase/anaphase	absent / no metaphase / anaphase ;
interphase or telophase	less <b>or</b> no telophase	more <b>or</b> (one/two cells in) telophase;
cell walls or cell shape or cell arrangement	not visible/absent or rectangular/4 sides or scattered/irregular/random	prominent/ present or 6 sides/5 sides or aligned/regular/ordered;
cell packing  or air spaces or cells touching	loosely packed/more spaced out/ separated or more air spaces or have spaces between cells or cells not touching	closely packed/less spaced out;  or none or few air spaces or have no spaces between cells or cells touching;
nucleus	present <b>or</b> all cells show a nucleus	not all cells show a nucleus or some cells have a nucleus;

[max 5]

[Total: 20]