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MARK SCHEME for the October/November 2014 series

9700 BIOLOGY

9700/35 Paper 3 (Advanced Practical Skills 1), 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) (10) 5 + 2.5 + 1.25 + 0.625 / 0.63 + percentage at least once ;

shows transfer of 20 cm^3 of suspension from previous beaker to 4 beakers ;

adds 20 cm^3 of water / **W** / H_2O to 4 beakers ; [3]

(ii) 1 all columns separated by a line + all headings underlined (or all rows separated by a line) ;

2 (top or left of data) percent(age) / % concentration of **Y** or yeast + (any column / row headed) colour / observation / appearance ;

3 records colours for at least 3 concentrations ;

4 records correct pattern ;

5 repeats ; [5]

(iii) ± + half smallest division + cm^3 ; [1]

(iv) colour (change) + difficult to judge / see / identify ; [1]

(v) 1 use different indicator ;

2 repeat ;

3 put glucose solution in water-bath to equilibrate ;

4 use set of colour standards in order to judge final colours ; [max 1]

(b) (i) 1 selects two variables ;

m*ax 2 for description of 2 methods – must have variable + description:*
2 pH + use of buffers ;

3 temperature + use thermostatically-controlled water-bath ;

4 type of milk / age of milk + same type / same age ;

5 size of beads/surface area / number of beads + use ruler / count beads ; [max 3]

(ii) 1 (label on *x*-axis) time alginate beads in contact with milk / minutes / mins + (label on *y*-axis) percentage / % hydrolysis (of) lactose ;

2 (scale on *x*-axis) 20 to 2 cm + labelled each 2 cm (except origin and 120) + (scale on *y*-axis) 20 to 2 cm + labelled each 2 cm (except origin and 100) ;

3 correct plotting of 5 points as small cross or dot (in circle) or cross in a circle ;

4 5 plots + ruled lines exactly point to point or curve through all plots + sharp line (less than line thickness on grid) ; [4]

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(iii) correct answer according to graph ; [1]

(iv) less contact time + fewer enzyme substrate complexes / ESCs ; [1]

(v) less substrate available/reference to equilibrium / end product inhibition ; [1]

[Total: 21]

2 (a) (i) 1 at least 2 cells in each (**I**, **M** and **DW**)
+ size at least 60 mm across widest point of widest cell
+ sharp continuous line for outermost line of each of the cells ;

2 3 groups of 2 cells + in each of the 3 groups the 2 cells touching ;

3 double lines for cell walls (for at least two cells) with middle lamella ;

4 at least one nucleus shown ;

5 nuclei uneven sizes ;

6 label with label line to one nucleus ; [6]

(ii) colour different / acceptable answer from candidates drawings ; [1]

(b) (i) folds / ridges / pits / grooves / projections / AW + large surface area ; [1]

(ii) only three extensions into the projection + width at widest point at least 60mm
+ no shading ;

no cells drawn + only drawn section in the box ;

at least one taste bud on each side of projection + irregular upper surface ;

draws tissues in correct proportion ; [4]

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(c) (i) 1 organise as a table + 2 columns headed Fig 2.3 and Fig. 2.4 (in any order) + third column or row containing at least one feature **;**

o*bservable differences max 3 – see table below:*

mp	(feature)	Fig. 2.3	Fig 2.4
2	furrows between projections / papillae / AW	(relative to Fig. 2.4) deep(er) or long(er) wider	(relative to Fig. 2.3) shallow(er) or short(er) narrower **;**
3	shape of projection / AW	(relative to Fig. 2.4) long(er) / columnar / elongated / rectangular / AW *not finger-like*	(relative to Fig. 2.3) Round / oval / circular / shorter / AW **;**
4	taste buds	(relative to Fig. 2.4) visible / present / large(r)	(relative to Fig. 2.3) not seen / absent / small(er) **;**
5	**E** (epithelial layer) surface of layer **E**	(relative to Fig. 2.4) thick(er) / wide(r) / large(r) / long(er) rough / wavy / uneven	(relative to Fig. 2.3) narrow(er) / thin(ner) / small(er) / short(er) rounded / smooth **;**
6	**L** layer surface of layer	(relative to Fig. 2.4) narrow (er) / thin(ner) / small (er) rounded / smooth	(relative to Fig. 2.3) thick(er) / wide(r) / large(r) wavy / uneven / rough **;**
7	extensions into projection / AW	(relative to Fig. 2.4) 3 extensions / more	(relative to Fig. 2.3) 1 extension / less **;**

[max4]

(ii) measures width of line **E** ± 1 mm + width of line **L** + units **;**

shows **L** divided by **E ;**

answer as larger whole number to: smaller whole number **;** [3]

[Total: 19]

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