Cambridge International AS & A Level

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BIOLOGY **9700/32**

Paper 3 (Advanced Practical Skills 2) **May/June 2016**

MARK SCHEME

Maximum Mark: 40

Published

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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) *(measures room temperature)*
whole number **or** to half a degree **+** °C **;** [1]

(ii) *(decides on intervals for temperatures)*
at least three additional temperatures **+** whole numbers **+** at even intervals **+** °C **;** [1]

(iii) *(recording results)*
1. table drawn **+** heading, temperature **+** °C **;**
2. heading, height **or** length (of foam) **+** mm **;**
3. records results for at least four temperatures **;**
4. correct pattern of results **;**
5. height **or** length (of foam) recorded as whole mm **;** [5]

(iv) *(sources of error with reason)*
appropriate error with reason **;**
e.g. difficulty of maintaining temperature within acceptable range
appropriate error with reason **;**
e.g. difficulty of measuring foam as not even layer in test tube [2]

(v) *(decides on control)*
boils yeast suspension **or** replaces yeast cell suspension with same volume of water **;** [1]

(vi) *(conclusion)*
(as temperature increases) *ref. to* more kinetic energy **;**
more successful collisions **or** more enzyme-substrate-complexes / ESCs formed **;** [2]

(vii) *(modification to investigate another variable)*
1. (to standardise temperature) stated temperature **+** thermostatically controlled water-bath **;**
2. (independent variable) at least five pHs **;**
3. (method) *ref. to* use of buffers **;** [3]

(b) (i) *(line graph)*
1. (*x*-axis) percentage concentration of glucose solution **+** (*y*-axis) volume of CO_2 released / cm^3 **;**
2. (scale on *x*-axis) 2.0 to 2 cm, labelled at least each 2 cm **+** (scale on *y*-axis) 2.0 to 2 cm, labelled at least each 2 cm **;**
3. correct plotting of five points with a small cross **or** dot in circle **;**
4. five plots **+** thin line drawn **;** [4]

(ii) *(interpretation)*
correctly reads from graph the volume of CO_2 at 3.5% **;** [1]

[Total: 20]

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2 (a) (i) *(plan diagram)*

1. plan diagram of appropriate size **+** no shading **;**
2. no cells **+** at least two vascular bundles **+** correct section drawn **;**
3. vascular bundle divided into at least two regions **;**
4. depth of one vascular bundle drawn in correct proportion to width of lamina **;**
5. uses one label line **+** one label to xylem **;** [5]

(ii) *(drawing)*

1. quality of line for outer wall of cells **+** size at least 40 mm across largest cell **;**
2. only four cells drawn, each cell touching at least one other cell **;**
3. cell walls drawn as two lines close together **;**
4. cells in a chain form part of a circle **;**
5. uses one label line **+** one label to cell wall **;** [5]

(b) *(calculation)*

1. *collects* number of eyepiece gratitude units equal to the length of the vascular bundle **;**
2. records whole numbers for eyepiece graticule units **;**
3. shows multiplication of numbers for eyepiece graticule units by 29.5 μm **;**
4. answer shown to appropriate accuracy **+** μm **;** [4]

(c) (i) *(observable differences between the leaf on **M1** and the leaf in **Fig. 2.2**)*
organises comparison into three columns with one column for features, one headed **M1** and one headed **Fig. 2.2** **;**
any three observable differences of comparison **;;;**
e.g. **M1** has more vascular bundles than **Fig. 2.2** [4]

(ii) *(conclusion)*
(feature) thick cuticle or sunken stomata or few stomata **;**
(explanation) reduces evaporation or reduces transpiration **;** [2]

[Total: 20]

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