Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

BIOLOGY **9700/35**

Paper 3 (Advanced Practical Skills 1) **May/June 2016**

MARK SCHEME

Maximum Mark: 40

Published

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.

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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

1 (a) (i) *(decisions on serial dilutions)*
1. correct concentrations of 0.5, 0.25, 0.125, 0.0625 **+** % **;**
2. shows transfer of 10 cm^3 of 1(%) to next dilution **+** 10 cm^3 transferred from 2nd to 3rd beaker and from 3rd to 4th and from 4th to 5th **+** cm^3 **;**
3. adds 10 cm^3 of water to each beaker **;** [3]

(ii) *(interpretation of percentage error)*
(actual error) ± half the smallest division on syringe **;**
(percentage error) correct answer using actual error **;** [2]

(iii) *(recording results and completing column headings)*
1. heading, percentage concentration of glucose **+** (units for time) seconds **;**
2. records results for times and colours for five concentrations of glucose solutions **;**
3. result for time for first colour 1% concentration of glucose is faster than for the lowest concentration of glucose recorded **;**
4. times recorded as whole seconds **;** [4]

(iv) *(decides how to standardise Benedict's test)*
decides to use the same volumes of glucose and Benedict's (2 cm^3) **;**
decides to heat water-bath to boiling **;** [2]

(v) *(collects result for solution **P**)*
records time **+** seconds **+** colour for solution **P** ; [1]

(vi) *(interprets result for solution **P**)*
correct estimate for concentration of solution **P** ; [1]

(vii) *(improvement)*
use colorimeter **or** carry out repeats **or** use more concentrations within range of the estimate **;** [1]

(viii) *(improvement)*
draw a calibration curve **;**
read off concentration of unknown from the calibration curve **;** [2]

(b) (i) *(graph)*
1. (*x*-axis) time after eating the meal / minutes **+**
(*y*-axis) concentration of glucose in blood plasma / mmol dm^{-3} **;**
2. (scale on *x*-axis) 20.0 to 2 cm, labelled at least each 2 cm **+**
(scale on *y*-axis) 0.5 to 2 cm, labelled at least each 2 cm, with 5 at the origin **;**
3. correct plotting of five points with a small cross **or** dot in circle **;**
4. five plots with either ruled lines exactly point to point **or** smooth curve drawn as thin line **;** [4]

(ii) *(calculation)*
shows 6.750 minus 5.125, divided by 5.125 and multiplied by 100 **or** alternative correct method **;** [1]

(iii) *(conclusion)*
draws one label line and label **X** to indicate the section of the graph between time at 0 minutes and time at 20 minutes **;** [1]

(iv) *(conclusion)*
ref. to glucose used by the cells (for respiration) or AVP **;** [1]

[Total: 23]

2 (a) (i) *(plan diagram)*
1. plan diagram of appropriate size **+** no cells **;**
2. at least three layers of tissue (4 lines) **+** correct section drawn **;**
3. draws tissue layer beneath epidermis **;**
4. diameter of the stele approximately a third of the diameter of the root **;**
5. uses one label line **+** label **Z** to the endodermis **;** [5]

(ii) *(conclusion)*
root **+** stele / xylem / vascular tissue in the centre **;** [1]

(iii) *(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 two of the other cells **;**
3. cell walls drawn as two lines close together **;**
4. records at least one air space between the cells **;**
5. uses one label line **+** one label to cytoplasm of one cell **;** [5]

(b) *(calculation of magnification)*
1. measures line **A** – **B** correctly in whole mm **or** 0.5 mm **;**
2. shows measurement for **A** – **B**, converted to micrometres, divided by 3000 or measurement for **A** – **B** in millimetres divided by 3 **;**
3. correct magnification from calculation **;** [3]

(c) *(observable similarities between organ on **L1** and that shown in **Fig. 2.2**)*
organises table so that one column for features **;**
any two observable similarities **;;**
e.g. **L1** and **Fig. 2.2** stele / vascular bundle in centre [3]

[Total: 17]