CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

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.

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) records volume of **H** as whole number (or to 0.5) **+** cm^3 **;** [1]

(ii) records length of time as every 2 minutes, e.g. 2, 4, 6, 8 **+** 10 minutes **;** [1]

(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 $\underline{CO_2}$ 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]

(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*l* / cm^3 **;**
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]

(v) difficult judging colour of end-point (blue / cloudy yellow) or mixing **H** and **C** varies for each test-tube **;** [1]

(vi) syringe or ruler **+** no effect **+** if use same syringe or ruler
or
syringe or ruler **+** results not accurate **+** not true value **;** [max 1]

(b) (i) (*x*-axis) even bar widths (**R** + **T**) up to 1 cm **+** (*y*-axis) labelled mean leaf area / cm^2 $plant^{-1} \times 103$ **+** 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]

(ii) (for **R** + **T**) as concentration of $\underline{CO_2}$ increases the <u>leaf area</u> increases **;**
quoted figures to support idea that plant **R** has greater mean leaf area than plant **T** at highest concentration of 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]

[Total: 22]

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2 (a) (i) at least 9 separate cells in total drawn in boxes **S1**, **S2** and **S3 +** 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 **S1**, **S2** and **S3 ;**
drawn only 3 cells in each of the three boxes **;**
at least one colour stated for each of the cells in the boxes **S1**, **S2** and **S3 ;** [4]

(ii) **S1** – 100 (°C)
S2 – 45 (°C)
S3 – 80 (°C) **;** [1]

(iii) yeast cells blue **+** therefore inactive or dead **;** [1]

(iv) heat to at least two named temperatures, at least 10 °C apart, between 45 °C and 80 °C **;**
count dead / blue yeast cells (from sample of yeast cells) **;**
plots graph to find unknown temperature **;** [3]

(b) (i) at least 4 whole cells **+** no shading **+** size at least 20 mm across cell with greatest width **+** sharp and continuous outer line **;**

only five whole cells **;**
at least 2 cells with inclusions **;**
at least 2 cells with buds **;**
uses label line and label to nucleus or cytoplasm **;** [5]

(ii) five (measurements) between (9 mm to 15 mm) **+** to 0.5 mm **;**
shows addition of measurements **+** shows division by number of measurements **;**
show division by 1200 **;**
shows conversion of mm to μm as × 1000 **+** units **;** [4]

[Total: 18]

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