UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the May/June 2007 question paper

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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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1 (a) Description of Benedict's test that works; [1]
Reducing sugar present; [1]
But not much; [1]

(b) (i) All data recorded in a table; [1]
Table allows comparison between serial dilutions and fruit juice; [1]
At least two readings for each solution to check result; [1]
at least three different dilutions tested; [1]
one dilution greater than 0.2% and one less: [1]
column headings include concentration with units and colour; [1]

(ii) correct value/range for fruit juice concentration i.e. >0.1 and < 0.5; [1]

(c) (i) Volume of solutions measured and constant for each test
AND
Volume of Benedicts constant for each test; [1]
R Keep all volumes the same

(ii) **Two** from:
Inaccuracies in preparing solutions;
Difficulty in judging colour;
Time spent boiling; [1]

(d) *accept improvements that would enhance the reliability or accuracy of the experiment – three in outline or one or two explained – could be related to errors identified earlier or others*

Three from:
use more accurate measuring device e.g. colorimeter/compare colour chart;
method for measuring volumes more accurately;
use more replicates/repeat more times at each concentration of glucose;
use wider range of solutions at different concentrations;
alternative method proposed; [max. 3]

(e) (i) time for that pH should be much quicker/AVP (accept reading anomalous/not reliable unqualified) ; [1]

(ii) 9.6 with appropriate working shown; [1]
R more than two significant figures

(iii) independent variable (pH) on *x*-axis, dependent variable (mean time/min-1) on *y*-axis
AND axis labels appropriate (accept ecf from table if already penalised in **(b) (i)**); [1]
scale should be chosen so that data spans at least half of the width and height of the grid
AND scale appropriate such as 1:10, 1:5 or 1:2 (R awkward scales such as 3:10, 7:10, 8:10) (scale does not need to start at 0); [1]
data plotted accurately to within 1mm, using crosses or circle-with-dot
AND points joined with straight ruled lines OR fine curve drawn through the data points, not extrapolated beyond the first or last point; [1]

(f) at high and low pH reaction rate decreases
AND optimum/fastest reaction at pH 7 /AW; [1]

(g) IDEA OF at optimum pH or pH 7 the data supports the student's hypothesis
AND above and below pH7 the hypothesis is not supported; [1]
IDEA OF enzyme becoming gradually denatures at low and high pH; [1]

[Total: 23]

2 (a) (i) root cap; [1]

area of mitosis correctly shown; [1]

(ii) Working shows number of micrometre divisions divided by number of eyepiece divisions; [1]

Diameter of specimen correct with units; [1]

(iii) their reported measurement ± 0.5 μ; [1]
(accept answers between ± 0.2 μ and ± 0.5 μ)

(iv) thickness of scale lines/matching the scales/AVP; [1]

(b) (i) table used to present data;
(R comparative lists without lines to divide information)
both similarities and differences;
vacuolation;
cells longer;
cells wider;
Nucleus same size; [max. 4]

(ii) Cells get longer; [1]
Absorb water; [1]

(c) **Five** from:
at least half of area of available space used to represent/describe the cells;
drawings/descriptions of cells including cell walls, and nuclear material;
two different stages represented with chromosomes;
some chromatids shown in 'spindle pulling apart' pattern;
accurate pattern of chromosomes;
drawing used to represent observations – clear outline drawings, sharp pencil and no shading; [max. 5]

[Total: 17]

[Paper total: 40]