UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the November 2005 question paper

0610 BIOLOGY

0610/06 Paper 6

Maximum mark 40

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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*.

The minimum marks in these components needed for various grades were previously published with these mark schemes, but are now instead included in the Report on the Examination for this session.

- CIE will not enter into discussion or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the November 2005 question papers for most IGCSE and GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

1 (a) (i) and (ii) **[1] and [1]**

concentration of glucose solution /mols dm $^{-3}$	potato pieces after being left in glucose solutions	length of potato/mm	change in length/mm
0.2		1 65 2 67 3 66	
		mean 66	**+ 6**
0.4		1 65 2 61 3 63	
		mean 63	**+ 3**
0.6		1 56 2 61 3 60	
		mean 59	**- 1**
0.8		1 55 2 59 3 54	
		mean 56	**-4**
1.0		1 53 2 58 3 54	
		mean 55	**-5**

(iii) correct value;
sign +/-; **[2]**

(iv) repeat/reliability; R. to calculate an average, increasing accuracy. **[1]**

(b) (i) S scale to fill grid;
P + P for accurate plot including +/-;;
L for suitable clear line; **[4]**

(ii) movement of water only;
osmosis;
gradient or ref to water potential;
above/increase in length - intake of water;
below/decrease in length - loss of water;
reference to partially permeable membrane/AP;. **[Max4]**

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(c) **(i)** value below 0.55 mols dm^{-3} [0.54 to 0.56]. **[1]**

(ii) idea of balance with cell sap/tissue and solution balance;
water moving inwards = water moving outwards;
no net change;
ext conc equals internal conc/AW;
accept. in terms of water potential. **[2]**

TOTAL [16]

2 **(a)** **(i)** drawing :- larger than Fig. 2.1;
clear outline;
proportion;
labels:- cotyledon;
radicle;
plumule;
testa; **[Max 6]**

(ii) measured length of seed on drawing and of seed on Fig 2.1;
correct sum attempted;
correct magnification; **[3]**

(b) soaked seeds;
equal mass/AVP;
grind up/chop seeds;
dissolve protein;
test with biuret reagents;
detail of quantity of reagents;
purple colour develops;
comparison of colour/use of colorimeter;
equal ONCE **[Max 4]**

TOTAL [13]

3 **(a)** use of microscope;
cell counter;
sample taken on a slide;
stain cells;
high power magnification;
count on slide AW;
multiply for flask volume;
repeat;
dilute sample;
equal sample taken at timed intervals; **[Max 4]**

(b) lag [to LHS];
log [to RHS];
accurate location of **Q** at 6 hours [A. 5-7]; **[3]**

(c) **(i)** warmth/suitable temperature;
sterile medium/stop contaminants;
suitable nutrients;
aeration; **[Max 2]**

(ii) numbers stop increasing/increase in number will drop; R. decrease. **[1]**

(iii) curve flattens/plateaus/falls; **[1]**

TOTAL [11]

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