UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2012 question paper

for the guidance of teachers

5090 BIOLOGY

5090/31 Paper 3 (Practical Test), 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.

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International Examinations

1 (a)

	height of dough / mm	
	S1	**S2**
initial height		
final height after 30 mins		
change in height		

1 – initial two readings – should be similar (within 5 mm)
1 – for final two readings;
1 – change according to figures given;
1 – change in height – positive(+) to be given in S1. [4]

(b) (i) **S1** increased more / **S2** very little change;
Credit for use of figures;
shows bubbles / gas / froth in S1 (on the surface of dough) or converse in S2; meniscus.
[max 3]

(ii) aerobic / anaerobic;
<u>respiration;</u>
release of carbon dioxide / gas;
trapped inside the dough causing it to rise;
more S1 / ORA; [max 3]

(c) same dough mixture;
at least three of temperatures within acceptable range;
incubate the yeast mixture at set temperature;
measure height (by levelling top of mixture); compare;
repeat to increase reliability;
control without yeast;
calculate mean; [max 5]

[Total: 15]

2 (a) Drawing – clear outline of leaflets (minimum of three) attached to a branch (no shading);
proportion – minimum of 7 cm;
lamina (midrib double line)+ petiole; serrated margin; [max 3]

Labels – lamina / blade; midrib / veins,
petiole / leaf stalk; bud / stipule at base [max 2]

(b) Photosynthesis;
Flat / thin leaf plus ref to gaseous exchange / diffusion / light penetration;
(Green) chlorophyll plus ref to absorption of light;
Leaf with large surface area plus ref to gas exchange / light;
Attachment – transport (if correct) to stem / veins. [max 3]

(c) Reference to the leaf closing around or over insect / leaf margins forming trap / ref to pointed structures [1]

(d) (i) Nitrate / nitrogen containing compound / phosphate; [1]
Not nitrogen alone

(ii) Enzymes / proteins / nucleic acids / DNA / cell membrane / forms new protoplasm / growth / chlorophyll; [1]

[Total: 11]

3 (a) (i) Stamen / anther / pollen sac correctly named / indicated [1]

(ii) Stigma / stigmatic surface correctly identified / named [1]

(b) (i) Prepare solution / tissue / cut up / grind in water;
Add Benedict's solution; heat; one safety feature e.g. in water bath / use of tongs / gloves / lab coat;
Expected colour change if positive; [max 4]
A – brown qualified e.g. reddish (for orange).
R – incorrect colour change
A – use of clinistix – max 3 marks

(ii) Green / yellow / red; [1]

(c) (i)

time / hours	length / mm
0.0	(0)
2.0	18 – 20
4.0	23 – 25
6.0	28 – 30
8.0	34 – 36
10.0	41 – 43

[2]

A – ranges shown but units not required.
A – 2 marks for no errors
A – 1 mark for one error

(ii) Orientation of axes with time (t) on X axis & length on Y axis;
Clear plots to cover at least half of the grid and with zero indicated;
Neat line drawn (connections ruled / line of best fit). [3]

(iii) Growth faster in first 2 hours (at first) then becoming slower / constant; [1]

(d) Towards chemical / hormone (in ovule); [1]

[Total: 14]