UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2011 question paper for the guidance of teachers

5090 BIOLOGY

5090/32 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.

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

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International Examinations

1 (a) (i) drawing marks; [3]
at least 7 cm good shape, (ridged) entire outline of transverse section;
realistic vascular bundles;
stained areas shown;

labels:
vascular bundles / xylem;
stained areas indicated;
epidermis / thickened tissue; R – epicarp [max 2]

(ii) shown where measured;
measurements to 1 mm (0.1 cm); (units/decimals given at least once)
drawing size over specimen equivalent;
magnification suitably expressed; [4]

(b) (i) simple diagram of vertical section (R – transverse section);
simple diagram of streak of stain down tissue (v.b.);
ref spread down tissue;
ref staining of other (thickened) tissue at end of specimen; [max 3]

(ii) uniform (all parts) in potato – regional (mainly v.b., xylem) in celery;
more heavily stained in potato, less heavily stained in celery /
turns black in potato, brown in celery; [2]

(c) starch turns black with iodine;
uniform/ all over/ widely spaced in potato tissue;
ref to storage (tissue/organ);
xylem / vascular/ conducting / tubular tissue in celery; (R – phloem as conducting tissue)
no/less starch in celery (or reverse more starch in potato);
ref staining of walls /xylem
ref to lignified tissue; [max 6]

[Total: 20]

2 (a) (i) preparation – cut/crush /chop (on tile);
dissolve /shake in ethanol;
add water / to water;
cloudy /chalky/ white emulsion if fat present; R – precipitate
remains clear/colourless / no change if none; [max 4]

(ii) preparation – cut/crush/chop (on tile)
add Biuret reagent;
mauve /purple /lilac / violet if protein present; R – precipitate
remains blue/no colour change if none; [4]

(b) **Table 2.1**

	fats		proteins	
Observation	W1	W2	W1	W2
	stays clear / faintly cloudy	goes cloudy	faintly mauve	goes mauve
Conclusion	no fat / <u>small amount</u>	fat present	<u>small amount</u> present	protein present

Marks for Table
note that alternatives for colour observations are given in **(a)(i)** and **(ii)**.
column 1 (I mark if consistent)
column 2 (2 marks to allow clear terminology for fats)
column 3 (1 mark if consistent and to allow positive results for proteins)
column 4 (2 marks to allow clear terminology for proteins) [6]

(c) suitable named specimens e.g. W1/W2/ food rich in fats, carbohydrates;
measured mass (of substrate) ;
measured volume (of water);
use of forceps /needle and ignited/burned;
used to heat water (in tt);
measure initial and subsequent temperature;
note temp. <u>increase;</u>
more energy release;
repeat the procedure /compare with another specimen;
OVP – re-ignition/ complete combustion /replication and taking mean values [max 6]

[Total: 20]