

**MARK SCHEME for the October/November 2011 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.

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

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- 1 (a) Bubbles on surface/escape ; ref. stomata
air/gases in leaf spaces ; expands [4]

- (b) (i) and (ii) Table 1.1

	D2	D3
Observation	leaf turns black ; slowly/after a while ;	leaf stains brown/yellow ;
Conclusion	starch present	no starch in this leaf

Table 1.1

[up to 4]

- (iii) To soften tissue/improve penetration/permeability/ref. to killing cells [1]

- (iv) Ref. to light difference ;
Plant in dark/covered/in container [1]

- (v) D2 plant in absence of light ;
No starch remaining ;
Explained re P/S ; respiration ; translocation ; [up to 4]

- (c) Discs cut – cork borer ;
Dipped (briefly) in boiling water ;
Ref. to killing cells/cytoplasm/stop enzyme activity/increase permeability ;
Heated in ethanol ;
to remove chlorophyll/colour ;
ref. use of water – bath ;
for safety/risk of fire ; [up to 5]

[Total: 19]

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- 2 (a) (i) Heat with Benedict's ;
for some time ;
in hot water – bath
use same volume/equal amount of solution containing r/s ;
same volume/stated amount of Benedict's [4]
- (ii) observe progressive colour change – green, yellow, orange (ppt) ;
rate of change ; [up to 1]
- (iii)
- | | Glucose solution | Solution from D4 |
|-------------|-------------------------|-------------------------|
| Observation | Yellow/orange/red | green/yellow/orange |
| Conclusion | strong presence of RS | pro rata |
- [2]
- (iv) melon/D4 ; [1]
- (b) replicate/repeat ;
OVP ; (e.g. filter to obtain juice/colorimeter/accurate volume measurement. [2]

[Total: 10]

- 3 (a) (i) clean lines ;
realistic ;
at least 5 cm ;
achene, with some structure shown ;
pappus with hairs well drawn ; [5]
- (ii) Clearly shown where measured/ruled line ;
both dimensions clear, units once at least ;
correct expression for calculation ;
mag. correctly expressed ; [up to 3]
up to 2 d. p. rounded up/down acceptably
- (iii) Large surface area/ref s.a. to volume ratio/wing-like/parachute/oval and broad ;
wind/air ;
resistance ;
delays fall to ground/ref to floating/gliding ;
to be carried further/long distance [up to 3]

[Total: 11]