

**MARK SCHEME for the May/June 2013 series**

**0654 CO-ORDINATED SCIENCES**

**0654/52**

Paper 5 (Practical), maximum raw mark 45

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.

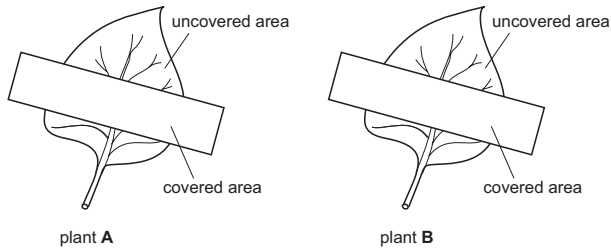
Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

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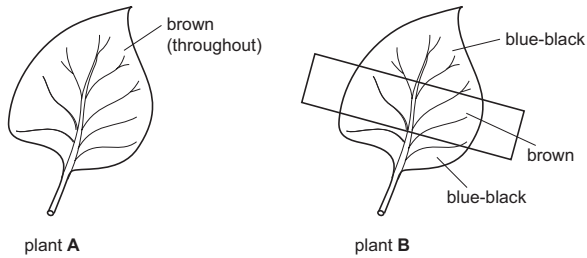
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- 1 (a) both leaves drawn ;  
 clear pencil drawings ;  
 drawings show leaf veins ;  
 drawings clearly show which parts are covered with black paper ;



[4]

- (b) both leaves clearly drawn with pencil ;  
 leaf A is all brown ;  
 leaf B is blue-black (where there was no tape) ;



[3]

- (c) last column has 'no' in first three boxes ;  
 last column has 'yes' in fourth box ;

[2]

		colour obtained with iodine	starch is present (yes or no)
leaf from <b>plant A</b>	area covered by black paper	<b>brown</b>	<b>no</b>
	area not covered by black paper	<b>brown</b>	<b>no</b>
leaf from <b>plant B</b>	area covered by black paper	<b>brown</b>	<b>no</b>
	area not covered by black paper	<b>blue-black</b>	<b>yes</b>

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- (d) (i) carbon dioxide is needed (for photosynthesis) ; (ignore references to light etc) [1]  
(ii) light is needed (for photosynthesis) ; (ignore references to CO<sub>2</sub> etc)
- (e) (i) to kill/soften the leaf/to prevent (enzyme) reactions ; [1]  
(ii) to remove chlorophyll/allow iodine colour to be seen ; [1]  
(iii) to make leaf flexible/allow it to be spread out/to soften leaf ; [1]
- (f) removes the variable of different plants ; [1]

[Total: 15]

- 2 (a)  $P = 50.0$  to  $60.0$  cm and recorded to  $0.1$  cm ; [1]
- (b) 2 time values for 20 oscillations recorded ;  
5 time values for 20 oscillations recorded ;  
all time values to the nearest second ;  
time values decreasing ; [4]
- (c) (i) complete set of  $T$  values calculated correctly (2 significant figures or more) ; [1]  
(ii) complete set of  $T^2$  values calculated correctly to 2 decimal places ; [1]
- (d) (i) axes labelled with units ;  
suitable choice of scales including the origin ;  
4 points plotted correctly to half a small square ;  
good best fit straight line judgement ; [4]  
(ii) indication on graph of how data obtained ;  
correct calculation of gradient ; [2]
- (e)  $P$  value calculated correctly from correct intercept ; [1]
- (f) yes agrees – close enough allowing for experimental error ;  
**OR**  
no does not agree – difference cannot be attributed to experimental error ;  
(an alternative to experimental error could be a reference to a specified  
part of the experiment) [max 1]

[Total: 15]

3 (a) (i)

solution A	solution B	solution C	solution D
purple/blue	purple/blue	red/pink	red/pink

[1]

(ii)

solution A	solution B	solution C	solution D
brown (ppt) ; [1]	no visible reaction / no ppt / no change / colourless (solution)	white ppt ; [1] (not cloudy / milky)	no ppt / no change / colourless (solution) / slight white ppt / cloudy / milky

both shaded boxes in (ii) for 1 mark ;

[max 3]

(iii)

solution A	solution B	solution C	solution D
no visible reaction / no ppt / no change / colourless (solution)	no visible reaction / no ppt / no change / colourless (solution)	no visible reaction / no ppt / no change / colourless (solution)	white ppt ; [1] (not cloudy / milky)

all three shaded boxes in (iii) for 1 mark ;

[max 2]

(iv)

solution A	solution B	solution C	solution D
blue ppt ; [1]	dark blue solution ; [1] (ignore blue ppt)	blue solution / no visible reaction (not 'no change')	blue solution / no visible reaction (not 'no change')

both shaded boxes in (iv) for 1 mark ;

[max 3]

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- (b) (i) **C and D** ;
- (ii) **D and** test (a)(iii) /  $\text{BaCl}_2$  ;
- (iii) **C and** test (a)(ii) /  $\text{AgNO}_3$  ; [1]
- (iv) **A and** test (a)(iv) /  $\text{CuSO}_4$  ;  
**OR**  
**A and** test (a)(ii) /  $\text{AgNO}_3$  if brown (ppt) obtained ; [max 1]
- (v) **B and** test (a)(iv) /  $\text{CuSO}_4$  ; [1]
- (vi) carbonate (or formula) / suitable reactive metal e.g. Mg / named indicator **and** colour for either acid or alkali / pH meter **and** either acid less than 7 **OR** alkali more than 7 ; [max 1]

**[Total: 15]**