

**MARK SCHEME for the May/June 2012 question paper  
for the guidance of teachers**

**0654 CO-ORDINATED SCIENCES**

**0654/51**

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

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- 1 (a) (i) green ;  
chlorophyll ;
- (ii) **A**: blue-black/black/blue/violet ;  
**B**: brown/orange/yellow ;  
starch present in **A** **AND** starch absent in **B** ; [3]
- (b) (i) to soften leaf/to kill leaf ; [1]
- (ii) photosynthesis occurred in leaf **A** ;  
due to light ;  
making starch/making glucose ;  
(or reverse argument for leaf **B**) [3]
- (c) (i) to prevent gas entering/escaping ; [1]
- (ii) to act as a control/to show that the leaf causes the colour change/to show  
that air used has normal levels of CO<sub>2</sub> ; [1]
- (iii) tube **C**  
CO<sub>2</sub> used up/CO<sub>2</sub> levels fall/CO<sub>2</sub> converted ;  
due to photosynthesis ;  
tube **D**  
CO<sub>2</sub> released/CO<sub>2</sub> levels rise ;  
due to: no photosynthesis/less photosynthesis/respiration ; [4]
- [Total: 15]**
- 2 (a) (i) **V** and **I** reading for 20 cm, **AND V** and **I** same order of magnitude as  
supervisor, **AND V** greater than **I** ; [1]
- (ii) **V** and **I** reading for 40 cm, **AND V** greater than **I** ; [1]
- (iii) **V** and **I** readings for 60, 80 and 100 cm ;  
**V** increases and **I** decreases down the table ; [2]
- (iv) all **R** values calculated for 5 or 4 sets of readings to same number of  
decimal places ; [1]
- (b) (i) *axes*: correctly labelled with units ;  
*scale*: linear and good use of grid ;  
*points*: 4 points plotted correctly within ½ square ;  
*line*: best straight line passing through (0,0) within ½ square ; [4]
- (ii) working shown on graph or below graph ;  
gradient calculated correctly ; [2]
- (iii) cross-sectional area, **C** calculated correctly to 2 significant figures ; [1]
- (iv) answer **(b)(iii)**/ 10 000 ; [1]

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- (c) current, **I** ... would be greater/increases ;  
resistance, **R** ... would be lower/decreases ;

[Total: 15]

- 3 (a) (i) *residue*: green ;  
*filtrate*: colourless ; [2]
- (ii) *observations*:  
bubbles / fizzes / effervesces ;  
green solution ;  
*conclusion*:  
carbonate /  $\text{CO}_3^{2-}$  ; [3]
- (iii) *observation*:  
blue ppt ;  
*conclusion*:  
copper /  $\text{Cu}^{2+}$  / Cu(II) ; [2]
- (b) (i) *observation*:  
white ppt ;  
*conclusion*:  
chloride /  $\text{Cl}^-$  ; [2]
- (ii) *observation*:  
no change ;  
*conclusion*:  
not sulfate / not  $\text{SO}_4^{2-}$  ; [2]
- (iii) *observation*:  
no ppt ;  
litmus stays red ;  
*conclusion*:  
not ammonium (ion) / no ammonia ;  
*possible identity*:  
sodium / potassium (Group 1 metal ion) ; [4]

[Total: 15]