

**MARK SCHEME for the May/June 2011 question paper  
for the guidance of teachers**

**0653 COMBINED SCIENCE**

**0653/61**

Paper 6 (Alternative to Practical), maximum raw mark 60

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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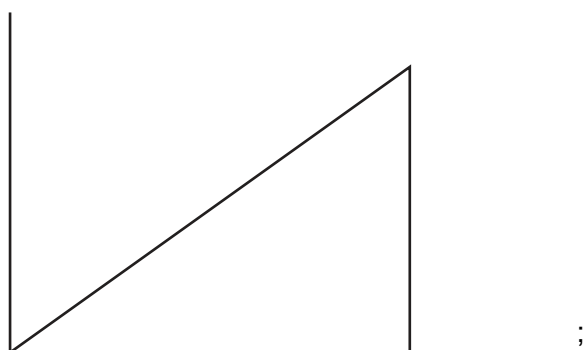
Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – May/June 2011	0653	61

- 1 (a) (i) 93, 86, 31, 27 ;  
(all 4 correct = 2 marks, 3 correct = 1 mark) [2]
- (ii) yes, similar repeats **OR** no, repeats too different ; [1]
- (iii) 1 mark for a correct mean formula (e.g.  $93 + 86/2$ ) ;  
89.5 ;  
29 ; [3]
- (iv) inhaled air longer time (than exhaled) ;  
inhaled has more oxygen ; [2]
- (v) (B cloudy (A not))  
higher CO<sub>2</sub> ;  
from respiration ; [2]

[Total: 10]

- 2 (a) (i) 0.2, 0.3, 0.4 (all 3 = 1 mark) ; [1]
- (ii) 50, 68 (both required) ; [1]
- (iii) labelled axes and sensible scales ;  
correct points ;  
straight line through origin ; [3]
- (iv) proportional / linear ;  
(due to) straight line (graph) ; [2]
- (v) from graph (42 mm)+/- 1 ;  
clear indication on graph ; [2]

(b)



[1]

[Total: 10]

<b>Page 3</b>	<b>Mark Scheme: Teachers' version</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>IGCSE – May/June 2011</b>	<b>0653</b>	<b>61</b>

- 3 (a) (i) (damp) (red) litmus ; turns blue ; [2]
- (ii) ammonium (ion) ; [1]
- (b) (i) iron<sup>3+</sup> / iron(III) / Fe<sup>3+</sup> (**not** iron<sup>2+</sup> etc.) ; [1]
- (ii) (acidified) silver nitrate (solution) ; white ppt. if positive / Cl<sup>-</sup> present ; no change if negative ; [3]
- (iii) sulfate (ion) ; [1]
- (iv) to remove / dissolve any carbonate (ions present) ; [1]
- (c) iron(III) ammonium sulfate (allow ecf but must be 2 cations and 1 anion) ; [1]

**[Total: 10]**

- 4 (a) (i) at temperature 10 °C volume = 25 cm<sup>3</sup> ; at temperature 40 °C volume = 61 cm<sup>3</sup> ; [2]

(ii)

temperature / °C	increase in volume of dough (v-25) / cm <sup>3</sup>	rate of increase in volume cm <sup>3</sup> / min (v-25) / 30
10	<b>0</b>	<b>0</b>
20	<b>6</b>	<b>0.2(0)</b>
30	<b>22</b>	<b>0.73</b>
40	<b>36</b>	<b>1.2(0)</b>
50	<b>29</b>	<b>0.97</b>
60	<b>0</b>	<b>0</b>

column 2 correctly completed ;; [2]

(iii) column 3 correctly completed ;; [2]

(b) 40 °C ; (ecf) [1]

(c) incubator / oven / water bath set ; [1]

(d) 20 to 30 °C (increasing rate of reaction) enzyme gaining (kinetic) energy ; 40 to 60 °C (decreasing rate of reaction) because enzymes are becoming denatured / destroyed ; [2]

**[Total: 10]**

Page 4	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – May/June 2011	0653	61

- 5 (a) (i) 51.5 (+/- 0.1) ;  
54.8 (+/- 0.1) ; [2]
- (ii) 1.5 ;  
4.8 ; (ecf) [2]
- (b) 31.3 ;  
42.8 ; [2]
- (c) **A:**  $49.8 \div 4.4 = 11.3$  ;  
**B:**  $31.3 \div 1.5 = 20.9$  ;  
**C:**  $42.8 \div 4.8 = 8.9$  ; (answers = 1 mark each) (ecf) [3]
- (d) **A** = lead **B** = gold **C** = copper ; (ecf) [1]

**[Total: 10]**

- 6 (a) (i) 73 ;  
39 ; [2]
- (ii) at least 5 points correctly plotted for each oxide ;;  
2 labelled curves / lines ;; (allow 1 mark if lines not labelled) [4]
- (iii) MnO<sub>2</sub> (no mark), more gas given off / gas given off faster / graph steeper ; [1]
- (b) spatula measures inaccurate / delay in putting stopper back in / delay in starting stopclock ; [1]
- (c) retrieve / wash catalyst ;  
use again / compare mass before and after ;  
(note 'use again', 'on its own' = no marks) [2]

**[Total: 10]**