UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2011 question paper

for the guidance of teachers

0654 CO-ORDINATED SCIENCES

0654/61 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.

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International Examinations

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_2 ;
from respiration ; [2]

[Total: 10]

2 (a) (i) 0.2, 0.3, 0.4 (all 3 = 1 mark) ; [1]

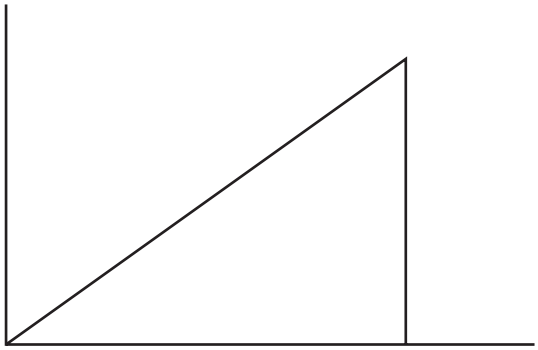
(ii) 50, 68 (both required) ; [1]

(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]

3 **(a)** **(i)** (damp) (red) litmus ;
turns blue ; [2]

(ii) ammonium (ion) ; [1]

(b) **(i)** $iron^{3+}$ / iron(III) / Fe^{3+} (**not** $iron^{2+}$ etc.) ; [1]

(ii) (acidified) silver nitrate (solution) ;
white ppt. if positive / C*l* 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^3 ;
at temperature 40 °C volume = 61 cm^3 ; [2]

(ii)

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

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]

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 ÷ 4.4 = **11.3** ;
B: 31.3 ÷ 1.5 = **20.9** ;
C: 42.8 ÷ 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_2 (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]