**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.

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

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

**1 (a) (i)** 93, 86, 31, 27 ;;
(all 4 correct = 2 marks, 3 correct = 1 mark)

**(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]

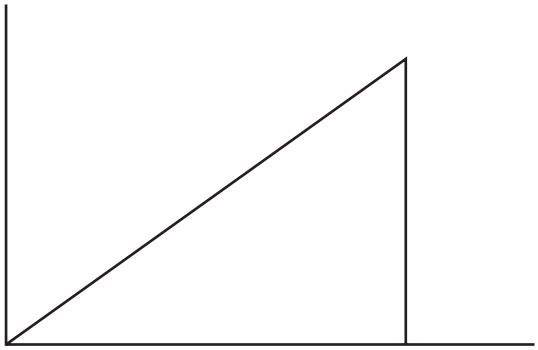
**(ii)** 50, 68 (both required) ; [1]

**(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 ;

**(ii)** ammonium (ion) ; [

**(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) ;

**(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]**