UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2011 question paper

for the guidance of teachers

0654 CO-ORDINATED SCIENCES

0654/62 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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1 **(a)** **(i)** 3 readings in table i.e. 103, 66 and 45 ;; (all 3 = 2 marks, any 2 = 1 mark) [2]

(ii) diffusion ;
acid neutralising / reacting with the alkali / indicator colourless in acid ; [2]

(iii) 0.6, 0.8, 1.0 ; [1]

(iv) rate increases with smaller volume or reverse argument ;
diffusion distance less / distance acid (has to) travel is less ; [2]

(b) large surface (area) ;
short diffusion path ;
large blood supply ;
thin walls ;
many villi ; [max 3]

[Total: 10]

2 **(a)** **(i)** (litmus turns) blue ; [1]

(ii) ammonium chloride ; (allow NH_4Cl) [1]

(b) **(i)** white precipitate ;
dissolves (on adding more sodium hydroxide) ; (allow turns to a colourless solution) [2]

(ii) sulfate (ions) ; (allow SO_4^{2-}) [1]

(iii) (precipitate) turns dark(er) (black etc.) ;
chloride (ions) ; (allow Cl^-) [2]

(c) **either** zinc sulfate ;
ammonium chloride ;
or zinc chloride ;
ammonium sulfate ; [max 2]

(d) NH_3 + HCl → NH_4Cl [1]

[Total: 10]

3 **(a)** **(i)** 62° (± 1 degree) ; [1]

(ii) 32 mm (± 1 mm) ; [1]

(iii) l = 101 mm (± 1 mm) ;
w = 60 mm (± 1 mm) ; [2]

(b) **(i)** suitable scale chosen and at least 1 axis correctly labelled ;
all points plotted ± 1 small square (allow 1 error) ;
smooth curve drawn and extended to 90° ; [3]

(ii) displacement distance shown on graph ;
and measured 60 mm (or as candidate's graph) ; [2]

(c) 'the width' or 'w' ; [1]

[Total: 10]

4 **(a)** **(i)** 6 mm ; [1]

(ii) 6 / 15 ;
= 0.4 mm ; [2]

(b) **(i)** good quality drawing ; [1]

(ii) length taken from student's drawing ;
magnification = length / 0.4 ;
= answer according to student's reading ; [3]

(c) **(i)** chloroplast ; [1]

(ii) photosynthesis does not take place in these cells ; [1]

(iii) vacuole labelled ; [1]

[Total: 10]

5 **(a)** **(i)** any suitable acid-base indicator. e.g. litmus, methyl orange, phenolphthalein ;
(**reject** Universal Indicator but allow e.c.f. for correct colours)

correct colours:	in acid	in alkali	
litmus	red	blue	
methyl orange	red	yellow	
phenolphthalein	colourless	red ;	[2]

(ii) sodium citrate ; [1]

(b) (i) orange: 11.8 ;
lemon: 24.3 ;
grapefruit: 17.4 ; (no tolerance)   [3]

(ii) 11.8, 23.5, 12.7 (e.c.f.) ;   [1]

(iii) lemon, grapefruit, orange ;   [1]

(c) measured / same volume of juice ;
measured / known sodium hydroxide concentration ;   [2]

[Total: 10]

6 (a) 0.7 cm ; 1.4 cm ; 1.0 cm ; (no tolerance)   [3]

(b) (i) when the zero adjuster moves 1 (mm), the scale will move 10 (mm) ;
the pointer arm is 10 times as long as the zero adjuster arm / height ;
movement of pointer is 10 times larger / owtte ;   [max 2]

(ii) 1.8 mm, 0.7 mm, 1.4 mm, 1.0 mm (3 or 4 correct) ;   [1]

(c) zinc, aluminium, copper, iron ;   [1]

(d) (i) they vibrate (but stay in the same place) ;   [1]

(ii) heat energy is given to the atoms ;
they collide with each other more (with higher energy / more force) / push
away (from each other) ;   [2]

[Total: 10]