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

0652 PHYSICAL SCIENCE

0652/62 Paper 6 (Alternative to Practical), maximum raw mark 60

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International Examinations

1 **(a)** 84.5 ; 70.2 ; (no tolerance) [2]

(b) 22.5 ; 27.0 ; (no tolerance) [2]

(c) **(i)** 84.5 / 22.5 = 3.8 (e.c.f.) ; [1]

(ii) 70.2 / 27.0 = 2.6 (e.c.f.) ; [1]

(d) **(i)** rock **A** is coal ; [1]

(ii) heat (burn) the coal, it ignites / gives off gas (vapour) / owtte ; [1]

(e) add dilute (hydrochloric) (nitric) acid ;
marble gives CO_2, quartz does not (both necessary) ; [2]

[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) present ; (allow Cl^-) [2]

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

(d) $NH_3 + HCl \rightarrow NH_4Cl$ [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)** the ball (is a metal and) conducts electricity when it passes between the contacts / owtte ; [1]

(b) 12 ; 19 (degrees) ; (± 1 degree) [2]

(c) **(i)** all points plotted correctly (± 0.05 s, 1 degree) ;
smooth curve drawn ; [2]

(ii) graph continued to 70 ° ;
read from graph approx. 1.2 s ; [2]

(d) **(i)** (gravitational) potential ; [1]

(ii) kinetic ; [1]

(e) acceleration (accelerating) ; [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]