CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2012 series

0652 PHYSICAL SCIENCE

0652/62 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.

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1 **(a)** **(i)** 0.52 A, 0.42 A (± 0.1) ;;
0.95 V, 1.15 V (± 0.1) ;; [4]

(ii) 0.95 / 0.52 = 1.83 (ecf) ;
1.14 / 0.42 = 2.74 (ecf) ; [2]

(iii) 1.83 / 40 x 100 = 4.58 ;
2.74 / 60 x 100 = 4.56 ; [2]

(b) (any answer)
the contact was not exactly on the mark ;
the ammeter readings were not accurate enough ;
the voltmeter readings were not accurate enough ;
the wire had heated up ; [max 1]

(c) (add them all up and divide by 5 to) find the average ; [1]

[Total: 10]

2 **(a)** **(i)** 35 degrees ;
50 degrees ; [2]

(ii) 0.57 ;
0.77 ; [2]

(b) **(i)** points correctly plotted ± half square (allow 1 error);
straight line drawn (line crosses at 100 max 2);
extending to sine $\theta = 1.00$; [3]

(ii) mass = 104 g (or as candidate's graph) ; [1]

(iii) friction ; [1]

(c) (the results should be the same) because gravity acts equally (on all three masses) ; [1]

[Total: 10]

3 **(a)** *observations*: bubbling is seen ;
gas pops ;
conclusion: hydrogen ; [3]

(b) red **OR** red-brown **OR** brown ; (reject yellow) [1]

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

(ii) *observation*: green ;
conclusion: iron(II) hydroxide ; [2]

(d) white precipitate ; [1]

(e) magnesium, zinc ; [1]

(f) $FeCl_3$; [1]

[Total: 10]

4 **(a)** **(i)** 24° ;
52.5° ; [2]

(ii) 13.5° ; [1]

(iii) experiment **1** exothermic ;
experiment **2** endothermic ; [2]

(b) covalent bonds (in oxygen) ;
ionic / electrovalent (bonds in white solid) ; [2]

(c) **(i)** 37.5° ; [1]

(ii) **EITHER** each oxygen atom shares two electrons ;
with two hydrogen atoms (accept any covalent molecule) ;
OR correct diagram showing covalent bond formation ;
in a molecule with correct formula ;
(accept for 1 mark, idea of sharing electrons) [max 2]

[Total: 10]

5 **(a)** 30° = 13, 42° = 26, 49° = 37 (all 3 for 1 mark) ; [1]

(b) suitable scale chosen, both axes labelled ;
all points plotted correctly (half square tolerance) ;
curve drawn ; [3]

(c) **(i)** the bubbles will come too quickly for the marks to be made (accurately) ; [1]

(ii) particles have more energy / move faster ;
more (effective) collisions (per unit time) ; [2]

(d) **(i)** carbon dioxide (or carbonic acid) + calcium hydroxide → calcium carbonate + water ;;
(all four correctly named 2 marks, two or three correctly named 1 mark) [max 2]

(ii) calcium carbonate is insoluble in water ; [1]

[Total: 10]

6 **(a)** **(i)** 113.6 g ; [1]

(ii) 37.8 g ; [1]

(b) **(i)** 91 cm^3 ; [1]

(ii) 41 cm^3 ; [1]

(c) density = mass / volume or 37.8 / 41;
= 0.9(2) g / cm^3 (ecf) ; [2]

(d) hexane is not as dense as ice ;
hexane melts at a temperature lower than –5 °C ;
hexane does not dissolve / react with ice ; [max 2]

(e) **(i)** ice floats on the surface **AND** the polar bears can walk on it / so that fish can live under the ice / other suitable answer ; [1]

(ii) the polar ice may melt **AND** the habitat of the polar bear will be destroyed / they may drown / other suitable answer ; [1]

[Total: 10]