CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0654 CO-ORDINATED SCIENCES

0654/63 Paper 6 (Alternative to Practical), maximum raw mark 60

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CAMBRIDGE
International Examinations

1 **(a)** Test **1**: red / orange ;
Test **2**: purple ; [2]

(b) **A** – protein ;
B – starch ;
C – (reducing) sugar ; [3]

(c) same volume of each solution / **D** and **E** ;
keep other factors / named factor constant ;
heat / warm (until no further change) / excess Benedict's ;
yellow / green = less concentrated ;
orange / red = more concentrated ;
[max 3]

(d) dissolve in / add ethanol **AND** add water ;
milky / cloudy / white (emulsion) ; [2]

[Total: 10]

2 **(a)** **(i)** delivery tube leading into limewater in suitable vessel ;
delivery tube above liquid level in reaction vessel and below liquid level in limewater ; [2]

(ii) limewater becomes milky / white precipitate / cloudy ; [1]

(iii) carbon dioxide ; [1]

(iv) carbonate ; [1]

(b) **(i)** (solution **D** contains) OH^- / hydroxide ions / is alkaline / is base ; [1]

(ii) copper(II) hydroxide ; [1]

(c) **(i)** magnesium carbonate / solid **A** (when heated) gives off carbon dioxide ;
and becomes magnesium oxide / owtte ; [2]

(ii) (magnesium oxide reacts with water and becomes) magnesium hydroxide ; [1]

[Total: 10]

3 **(a)** measuring cylinder ; [1]

(b) $T_2 = 81°C$;
$T_3 = 49°C$; [2]

(c) fall, rise, lose, gain (in correct order) ; [1]

(d) **(i)** $27°C / T_3 - 22$ (ecf) ; [1]

(ii) $32°C / T_2 - T_3$ (ecf) ; [1]

(e) **(i)** $13440\,J$ / **(d)(ii)** $\times$ 420 (ecf) ; [1]

(ii) $11340\,J$ / **(d)(i)** $\times$ 420 (ecf) ; [1]

(iii) $2100\,J$ / **(e)(i)** – **(e)(ii)** (ecf) ; [1]

(iv) $0.9(15) / \dfrac{\textbf{(e)(iii)}}{\textbf{(d)(i)} \times 85}$ (ecf) ; [1]

[Total: 10]

4 **(a)** arrow for *d* to centre of beaker ; [1]

(b)

Distance	Number of bubbles
70	**17**
50	**28**
40	**43**
30	**65**
20	**99**

;;

(all five correct is 2 marks, three or four correct is 1 mark) [2]

(c) suitable linear scale ;
4 correct plots ± 0.5 square ;
smooth curve ; [3]

(d) line to show ;
correct reading from 60 cm on graph ± 0.5 square ; [2]

(e) **(i)** photosynthesis ; [1]

(ii) as light intensity increases rate (of photosynthesis) increases ; [1]

[Total: 10]

5 **(a)** 77 ;
52 ; [2]

(b) suitable linear scales chosen with both labelled with the variable and at least one with the correct unit ;
4 correct points plotted ± ½ square ;;
smooth curves drawn and at least one labelled ; [4]

(c) **(i)** *copper sulfate (no mark)*
because the temperature rise is greater / more energy released / faster temperature increase ; [1]

(ii) there will be a greater temperature rise **AND** because magnesium is more reactive than zinc / is higher in the electrochemical series ; [1]

(d) *solid:* copper ;
solution: zinc sulfate ; [2]

[Total: 10]

6 **(a)** **(i)** 24 ; [1]

(ii) 65 ;
273 ; [2]

(iii) density of A*l* is: 2.7(083333) (ecf) ;
density of lead is: 11.4 / 11.375 / 11.38 (ecf) ; [2]

(iv) lead atoms are heavier than A*l* atoms ; [1]

(b) **(i)** length = 8.0 cm
width = 3.0 cm
height = 2.0 cm ; [1]

(ii) 48 cm^3 correctly recorded in the table twice ; [1]

(c) **(i)** the wood has absorbed water ; [1]

(ii) there are more air spaces in the balsa wood / balsa wood grows faster so is less dense ; [1]

[Total: 10]