

MARK SCHEME for the October/November 2014 series

0653 COMBINED SCIENCE

0653/63

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

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Page 2	Mark Scheme	Syllabus Paper
	Cambridge IGCSE – October/November 2014	065

- 1 (a) Test 1: red/orange ;
Test 2: purple ;
- (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 ;
- (b) $T_2 = 81^\circ\text{C}$;
 $T_3 = 49^\circ\text{C}$; [2]
- (c) fall, rise, lose, gain (in correct order) ; [1]
- (d) (i) $27^\circ\text{C}/T_3 - 22$ (ecf) ; [1]
(ii) $32^\circ\text{C}/T_2 - T_3$ (ecf) ; [1]
- (e) (i) $13440\text{J}/(\text{d})(\text{ii}) \times 420$ (ecf) ; [1]
(ii) $11340\text{J}/(\text{d})(\text{i}) \times 420$ (ecf) ; [1]
(iii) $2100\text{J}/(\text{e})(\text{i}) - (\text{e})(\text{ii})$ (ecf) ; [1]
(iv) $0.9(15)/\frac{(\text{e})(\text{iii})}{(\text{d})(\text{i}) \times 85}$ (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]

Page 4	Mark Scheme	Syllabus Paper
	Cambridge IGCSE – October/November 2014	065

- (d) line to show ;
correct reading from 60 cm on graph ± 0.5 square ;
- (e) (i) photosynthesis ; [1]
- (ii) as light intensity increases rate (of photosynthesis) increases ; [1]
- [Total: 10]**

- 5 (a) 77 ; [2]
52 ;
- (b) suitable linear scales chosen with both labelled with the variable and at least one with the correct unit ;
4 correct points plotted $\pm \frac{1}{2}$ 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 ; [2]
273 ;
- (iii) density of Al is: 2.7(083333) (ecf) ; [2]
density of lead is: 11.4/11.375/11.38 (ecf) ;
- (iv) lead atoms are heavier than Al atoms ; [1]
- (b) (i) length = 8.0 cm
width = 3.0 cm
height = 2.0 cm ; [1]
- (ii) 48 cm³ correctly recorded in the table twice ; [1]

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2014	065	

- (c) (i) the wood has absorbed water ;
- (ii) there are more air spaces in the balsa wood / balsa wood grows faster so is less dense ;

[Total: 10]