

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

## **MARK SCHEME for the October/November 2015 series**

### **0653 COMBINED SCIENCE**

**0653/62**

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

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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0653	62

- 1 (a) *Benedict's*: (reducing) sugar ;  
*biuret*: protein ;  
*iodine*: starch ; [3]

(b)

<i>Benedict's</i>	<i>biuret</i>	<i>iodine</i>
green / yellow / orange / red ;	purple / lilac	(orange)
(blue)	purple / lilac (both) ;	blue-black / black ;

[3]

- (c) (i) dissolve in / mix with ethanol ;  
add water ; [2]

- (ii) cloudy / milky / white emulsion ; [1]

- (iii) milk is white / milky / cannot see the result / AW ; [1]

[Total: 10]

- 2 (a) apply a lighted splint / flame **AND** gas ignites / a flame is seen ; [1]

- (b) (i) suitable diagram of CO<sub>2</sub> passing into limewater ;  
white ppt. / white / milky ; [2]

- (ii) carbon dioxide ; [1]

- (c) calcium carbonate / calcium hydrogencarbonate ; [1]

- (d) (i) litmus paper / pH paper / universal indicator (in the vapour) ;  
blue to red (*blue can be line above*) ;  
**OR**  
full range indicator / universal indicator / pH indicator ;  
red / orange / yellow ; [max 2]

- (ii) to avoid ejection of hot acid / to avoid vapour of nitric acid / to avoid acid touching  
the paper ; [1]

- (e) connect a gas syringe to the tube / collect in measuring cylinder over  
water / counting bubbles (in water) ;  
find the volume of gas evolved in a fixed time / time taken to give out a certain  
volume of gas / number of bubbles in a fixed time / time taken for a certain number  
of bubbles ; [2]

[Total: 10]

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0653	62

- 3 (a)  $d = 25 \text{ cm}$ : 0.69 (amps) ;  
 $d = 40 \text{ cm}$ : 0.48 (amps) ;  
1.1 and 1.2 both required (volts, for  $d = 25$  and  $40 \text{ cm}$  respectively) ; [3]
- (b) (i) points correctly plotted  $\pm \frac{1}{2}$  small square (allow one error) ;  
straight line drawn ; [2]
- (ii) indication on graph of how data obtained **AND** at least half of line used ;  
correct calculation for triangle method using data from graph ; [2]
- (iii) 0.67 or 0.7 ; [1]
- (c) (i) the ammeter reading will be off the scale / current greater than 1A / the  
ammeter may be damaged ; [max 1]
- (ii) the wire will heat up / (so that) the resistance (of the wire) will be changed ; [1]
- [Total: 10]**
- 4 (a) (i)  $39 \pm 2 \text{ (mm)}$  ; [2]  
(OR (for max 1):  $39 \pm 4 \text{ (mm)}$  or  $3.9 \pm 0.2 \text{ (cm)}$ )
- (ii) shows measurement of the scale bar in working  $20 \text{ mm} \pm 1 \text{ mm}$  ;  
answer = 0.4 (mm) ; [2]
- (b) 32  
72  
45  
10 (all four numbers to be correct) ; [1]
- (c) (i) axes labelled with units;  
suitable linear scale;  
at least 4 plots correct  $\pm$  half small square;  
best-fit line peaking at or above  $0.5 \text{ mol/dm}^3$  ; [4]
- (ii) read from peak of graph  $\pm$  half small square ; [1]
- [Total: 10]**
- 5 (a) (i) rusty ; [1]
- (ii) the nail has not rusted / no change ; [1]
- (iii) the paint excludes air / oxygen / water / cannot react with air / oxygen / water  
/ prevents oxidation ; [1]

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0653	62

- (b) (i) lighted splint **AND** pops ; [1]
- (ii) (add aqueous) ammonia/sodium hydroxide **AND** green precipitate ; [1]
- (iii) yellow/orange/brown/red-brown ; [1]
- (iv) (add aqueous ammonia/sodium hydroxide and) orange/red-brown/brown precipitate ; [1]
- (c) hang mass from iron wire **AND** steel wire ;  
measure deflection/bend/distance with the ruler ;  
use wires of same thickness/same length ; [3]

[Total: 10]

- 6 (a) (teat) pipette/dropper ; [1]
- (b) (i) A: 16.5 ;  
B: 8.0 ;  
C: 11.5 ; [3]
- (ii) A  
C  
B ; [1]
- (c) (anhydrous) copper sulfate/cobalt chloride ;  
boiling/freezing point/melting point ; [2]
- (d) (i) measuring cylinder (*to measure*) volume ;  
balance/scale(s) (*to measure*) mass ; [2]
- (ii) the mass is divided by the volume/  $\frac{\text{mass}}{\text{volume}}$  ; [1]

[Total: 10]