

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

0654 CO-ORDINATED SCIENCES

0654/62

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

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- 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 CO₂ 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]

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- 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 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 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]

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- (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]