

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

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

**0652 PHYSICAL SCIENCE**

**0652/62**

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

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- 1 (a) sodium hydroxide ;  
and nitric acid ;  
(any order) [2]
- (b) 1. measuring cylinder / burette / pipette ;  
2. burette (accept *graduated* pipette) ; [2]
- (c) (i) Universal indicator / full range indicator ; [1]  
(ii) 10–14 inclusive ; [1]
- (d) so there is no indicator present as an impurity ; [1]
- (e) diagram shows suitable container e.g. evaporating dish being heated OR left for some time to allow water to evaporate ; [1]
- (f) diagram shows filter funnel with filter paper and vessel to collect filtrate; crystals and solution labelled and in correct position ; [2]
- [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 / UI (in the vapour) ;  
blue to red (blue can be in M1) ;  
  
OR  
  
full range indicator / UI / pH indicator ;  
red / orange / yellow ; [2]  
(ii) to avoid ejection of hot acid /  
to avoid vapour of nitric acid /  
to avoid acid touching the paper ; [1]

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- (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]

- 3 (a) 0.69 ; 1.1  
0.48 ; and 1.2 ; [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) 0.67/0.7 ; [1]

- (c) (i) the ammeter reading will be off the scale/current greater than 1A/the ammeter may be damaged ; [1]

- (ii) The wire will heat up/(so that) the resistance (of the wire) will be changed ; [1]

[Total: 10]

- 4 (a) (i) 57.4 ; [1]

- (ii) 53.3 ; [1]

- (iii) 4.1 ; allow ecf (ai–aii) [1]

- (b) (i) 1 plot for L = 5 correct to  $\pm \frac{1}{2}$  square ;  
(ii) Good best fit line;  
Line passes through the origin ; [2]

- (c) (i) Indication on graph of how data obtained AND at least half of line used ;  
Correct calculation for triangle method using data from graph ; [2]

- (ii) Line drawn above, steeper, straight, not crossing over ; [1]

- (d) Avoidance of parallax described/wait for spring to stop moving [1]

[Total: 10]

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- 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]
- (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 } in this order ;  
B } [1]
- (c) (anhydrous) copper sulfate / cobalt chloride ;  
boiling / freezing point / melting point ; [2]
- (d) (i) a measuring cylinder volume ;  
balance / scale(s) mass ; [2]
- (ii) mass ÷ volume ; [1]
- [Total: 10]**