

**MARK SCHEME for the May/June 2015 series**

**0653 COMBINED SCIENCE**

**0653/62**

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

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1 (a) 20.5 [1]  
 15.5  
 10.5  
 all three averages correct ;

(b) axes labelled with units ; [4]  
 vertical axis linear ;  
 points plotted correct  $\pm$  half small square ;  
 best fit straight line going through the origin  $\pm$  half small square ;  
 ecf on (a)

(c) lines on graph ; [2]  
 correct reading from graph  $\pm$  half small square ; ecf

(d) potato will take longer to rise / there will be fewer bubbles ; [1]

**OR**

potato will not rise / no bubbles ;

(e) glowing splint ; [2]  
relights ;

[Total: 10]

2 (a) (i) (dilute) hydrochloric acid ; [2]  
 carbon dioxide ;

(ii) limewater ;  
 white ppt / milky ; [2]  
 allow ecf for incorrect gas in (a)(i).

(b) sodium chloride ; [1]

(c)

	C	D
barium chloride solution	white ppt <b>AND</b>	white ppt ; [1]
ammonia solution	white ppt ; [1] dissolves (in excess) ; [1]	blue ppt ; [1] (dissolves in excess to) deep blue solution ; [1]

[5]

[Total: 10]

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- 3 (a) 17 (mm) ;
- (b) 13 and 10 ;
- (c) 1.47, 1.00, 0.76, 0.59, 0.47 ;  
all results to 2 dp ; [2]
- (d) (i) plots correct  $\pm 1/2$  square ; ecf  
straight line of best fit ; [2]
- (ii) **clear** indication of use of graph (triangle at least  $1/2$  of graph);  
correct value 0.07 ; [2]
- (iii) 14.3 (ecf from gradient value) ; [1]
- (e) Any **one** from: [1]  
use of darkened room / mark position of centre of lens in holder / place metre rule  
on bench / clamp ruler in position or keep in same position / ensure the centre of  
lens and the object are the same height above bench / card or lens or screen  
perpendicular to table ;

[Total: 10]

- 4 (a) (i) repeats ; [1]
- (ii) (experiment 1 is) anomalous result / one result is different from the  
others / one result doesn't fit the pattern / range is high(est) / range 1 and 2  
very high ; [1]
- (iii) do not include experiment 1 in average / carry out 4<sup>th</sup> experiment / repeat  
again ; [1]
- (b) control / baseline / normal rate / needed for comparison / normal habitat ; [1]
- (c) (i) increases heart rate ; [1]
- (ii) agree – similar / close to pond water result / removal of anomaly gives mean  
of 306 [max 1]  
**OR**  
disagree – 304 is an increased heart rate to 275 ;
- (d) axes labelled with units ; [2]  
bar for each solution with heights correct ;

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- (e) (i) 80(mm) ;
- (ii) 2(mm) ;

[Total: 10]

- 5 (a) (damp) red litmus paper ; [2]  
turns blue ;  
**OR**  
hydrogen chloride ;  
white fumes / smoke ;
- (b) universal indicator / litmus ; [2]  
(turns) red / pink ;
- (c) **two** properties of non-metals **from:** [1]  
dull / brittle / low density / low melting point / poor conductor of heat ;
- (d) (i) circuit including a cell and a lamp / ammeter ; [2]  
metal in circuit / some means of connecting a metal in ;
- (ii) use of water or steam (before acid) ; [3]  
use of acid ;  
comparing rate of gas evolved with other metals ;  
**OR**  
add bismuth to salts of other metals ;  
in solution ;  
if displaces it is more reactive ORA ;

[Total: 10]

- 6 (a) time x swings and divide by x ; [1]
- (b) 104.5 ; [1]
- (c) (no effect) (very) close together ; [2]  
no trend or pattern ;
- (d) 103.7 ; [1]
- (e) 9 ; [1]

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(f) one result/61 cm obviously wrong ;  
others show a trend ;  
shorter the thread shorter the period ;

(g) repeat experiment (at each length) **and** take average ;  
**or** repeat the 61 cm length (as anomalous reading) ;  
use different (specified in numbers) lengths ;

[max 1]

[Total: 10]