

**MARK SCHEME for the May/June 2012 question paper  
for the guidance of teachers**

**0653 COMBINED SCIENCE**

**0653/52**

Paper 5 (Practical Test), maximum raw mark 30

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

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- 1 (a) tube **A** – no change ;  
 tube **B** – time given in any format ; (not greater than 600 seconds)  
 times given in seconds ;
- (b) fatty acids neutralise the alkali /fatty acids react with sodium carbonate ;  
 pH reduced to less than 8 /solution becomes acidic ; [2]
- (c) boiled lipase gave no result ;  
 enzymes denature when heated ; [2]  
 (allow reverse argument for both marks)
- (d) judging the end point /lack of repeats /measuring errors /any other valid  
 suggestion ; [1]
- (e) tube **C**: purple /lilac ;  
 tube **C**: protein present ;  
 (do **not** award this mark if the colour in tube **C** is incorrect) [2]

[Total: 10]

- 2 (a) (i) mass of piece of pipe, **M**, in grams to 1 decimal point and within 20% of  
 supervisor ; [1]
- (ii) all 3 values of **l**, **d<sub>e</sub>** and **d<sub>i</sub>** **AND** **d<sub>e</sub>** greater than **d<sub>i</sub>** **AND** in cm ; [1]
- (iii) correct substitution ;  
 correct calculation to 2 or more significant figures ; [2]
- (iv) correct calculation to 2 or more significant figures ; [1]
- (v) correct calculation to 2 or more significant figures ; [1]
- (b) (i) volume of water and metal weight ; [1]
- (ii) volume of water and metal weight and pipe ;  
 (this must be greater than volume in (b) (i)) [1]
- (iii) volume of the piece of pipe ; [1]
- (iv) density within 0.5 of answer in (a)(v) ; [1]

[Total: 10]

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- 3 (a) (i) time 0 = start temperature recorded to nearest half a degree ;
- (ii) all readings entered to nearest half a degree ;  
maximum temperature achieved no more than 1 minute beyond supervisor's time ; [2]
- (iii) solid **A** darker grey / black / brown / pink / red ;  
solution **B** paler blue / grey / colourless ; [2]
- (b) (i) *points*: at least 5 correctly plotted to within  $\frac{1}{2}$  square within the first 3 minutes ;  
*line*: smooth curve will include one maximum ; [2]
- (ii) maximum temp rise from graph ,  $\Delta T = \text{max} - \text{start}$  in  $^{\circ}\text{C}$  ; [1]
- (iii)  $25 \times 4.2 \times \text{ans (b)(ii)}$  ;  
correctly worked out to 2 or more significant figures ; [2]

[Total: 10]