

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

**MARK SCHEME for the October/November 2014 series**

**0654 CO-ORDINATED SCIENCES**

**0654/62**

Paper 6 (Alternative Practical), maximum raw mark 60

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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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- 1 (a) (i) iodine (solution)/I<sub>2</sub> ; [1]
- (ii) changes from blue-black to brown ;  
starch is broken down/no longer present/digested ;  
broken down/digested by the amylase ; [3]
- (b) (i) starch/it is still present ; [1]
- (ii) amylase/enzyme is denatured/not working/inactive ; [1]
- (c) difficulty in distinguishing colours by eye ;  
drops not all the same size/pipette has no volume ;  
both tubes not tested at the same time ;  
cross contamination with dropping pipette used/uses same dropping pipette ;  
wells not labelled/mixing up results/owtte ;  
doesn't measure amount amylase/tubes **C** and **D** ; [max 1]
- (d) at least three temperatures (in a suitable range) ;  
no boiled amylase ;  
(compare) time for samples to become brown ;  
keeping other factors constant/a named factor constant ; [max 3]
- [Total: 10]**
- 2 (a) ensure rapid solution/dissolves quickly/owtte ; [1]
- (b) (i) 29.2 ;  
16.8 ; [2]
- (ii) -1.1, +7.2, -4.9 (ecf)  
all numbers correct ;  
all signs correct ; [2]
- (c) exothermic ;  
endothermic ; [2]
- (d) use insulated container/use plastic stirrer/cover the beaker/more accurate or  
digital thermometer ; [max 1]
- (e) more energy given out (when bonds are formed) ;  
than is taken in (when ions are pulled apart) ;  
*(allow 1 mark max temperature increases because energy given out/overall  
energy is given out)* [2]
- [Total: 10]**

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- 3 (a) (i) 10.3 ;  
20.5 ; [2]
- (ii) the extension is proportional to the load ;  
**OR**  
the load is proportional to the extension ; [max 1]
- (b) 3.7 ;  
2.2 ; [2]
- (c) (i)  $\frac{3.7}{3.7 - 2.2} = \frac{3.7}{1.5} = 2.5 \text{ (g/cm}^3\text{)} ;$  [1]
- (ii) mass ; [1]
- (iii) volume ; [1]
- (d) *any two from:*  
the wire may have a different density ;  
wire adds to the volume ;  
wire adds to the mass ;  
stone not fully immersed ;  
spring could be in the water ;  
pointer hitting the side of the beaker ;  
stone touching the beaker ;  
other sensible answer explained ; [max 2]
- [Total: 10]**
- 4 (a) (i) to confirm all the carbon dioxide has been removed from the air / to see if  
carbon dioxide still in air / to test for CO<sub>2</sub> ; [1]
- (ii) colourless ; [1]
- (b) (i) to see if carbon dioxide has been produced ; [1]
- (ii) milky ; [1]
- (c) flask 3 would have no insect / empty ; [1]
- (d) (i) red / orange / yellow ; [1]
- (ii) carbon dioxide ;  
dissolves ;  
production of acid (changes colour of the indicator) / owtte ; [3]

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(e) respiration ; [1]

[Total: 10]

5 (a) (i) hydrogen ; [1]

(ii) apply a lighted splint ;  
'pop' or gas burns with a small explosion ; [2]

(b) (i) calcium carbonate ; [1]

(ii) calcium hydroxide ; [1]

(c) metal **A** is magnesium ; [1]

(d) (i) white precipitate / solid / deposit ;  
which re-dissolves (when more NaOH is added) ; [2]

(ii)  $\text{Fe}(\text{OH})_2$  ; [1]

(e) white precipitate / solid / deposit (of silver chloride) ; [1]

[Total: 10]

6 (a) (i) (angle of incidence =) 55 (degrees) ;  
(angle of reflection =) 65 (degrees) ; [2]

(ii) the normal is not at  $90^\circ$  / perpendicular (to the mirror line) ; [1]

(iii) not obeyed because they should be equal / because angles of incidence and reflection not measured (because the normal is incorrect) ; [1]

(b) (i) both rays drawn correctly, touching the marks and meeting at the junction of the mirror line and the normal ; [1]

(ii) (incidence =) 35 (degrees) ;  
(reflected =) 31 (degrees) ; [2]

(iii) the mirror was not exactly in line with the mirror line / owtte ;  
the pencil mark(s) were in the wrong place / not in the centre of the beam ; [2]

(c) electrons ; [1]

[Total: 10]