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Cambridge International General Certificate of Secondary Education

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MARK SCHEME for the October/November 2014 series

0653 COMBINED SCIENCE

0653/62

Paper 6 (Alternative Practical), maximum raw mark 60

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| Page 2 | Mark Scheme | Syllabus | Number |
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- 1 (a) (i) iodine (solution)/I₂ ;
- (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 ;
- (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 CO₂ ; [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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| Page 4 | Mark Scheme | Syllabus |
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(e) respiration ;

[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° / 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]