

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0652 PHYSICAL SCIENCE

0652/62

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

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Page 2	Mark Scheme	Syllabus	Paper
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- 1 (a) (i) 22.0 (s) ;
27.5 (s) ; [2]
- (ii) $(200/22 =) 9.1$ (m/s) ;
 $(200/27.5 =) 7.3$ (m/s) ; [2]
- (iii) (car 4 =) 33 (km/hr) ;
(car 5 =) 26 (km/hr) ; [2]
- (iv) the car travels downhill so it may accelerate, speed changes /owtte ; [1]
- (v) there is a reaction time before the second student starts the timer /owtte ; [1]
- (b) (i) $(160 + 103 + 116 = 379) 379/3 = 126$ km/hr ; [1]
- (ii) cars travel too fast on the road, so unsafe for students /traffic fumes bad for health /other suggestion ; [1]
- [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]**

Page 3	Mark Scheme	Syllabus	Paper
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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) 11.5 ;
14.0 ; [2]
- (ii) 160 ;
195 ; [2]
- (b) (i) all points plotted $\pm 5 \text{ cm}^3 / 0.5 \text{ cm}$;
suitable straight line drawn ; [2]
- (ii) y/x values calculated ;
shown on graph ; [2]
- (c) measure magnesium ribbon more accurately / owtte ;
use measuring cylinder with more graduation lines ;
stopper the flask before the Mg ribbon meets acid ; [max 1]
- (d) use acid of greater concentration / warm the mixture / cut into smaller pieces ; [max 1]

[Total: 10]

Page 4	Mark Scheme	Syllabus	Paper
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- 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]**