UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2009 question paper for the guidance of teachers

0652 PHYSICAL SCIENCE

0652/06 Paper 6 (Alternative to Practical), maximum raw mark 60

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1 **(a)** 11.5 V +/– 0.1 V (1)
1.55 A +/– 0.05 A (1) [2]

(b) **(i)** R = V/I [1]

(ii) 11.9/0.72 = 16.5 ohms (ecf from **(a)** and **(b)(i)**) [1]

(iii) 11.5/1.55 = 7.4 ohms (ecf) [1]
(if the correct method was used in **(ii)** and **(iii)** but calculation wrong, allow 1 mark total for **(ii)** and **(iii)**)

(c) the filament melted/fused OWTTE (1)
because the voltage was too high/resistance too low/current too great (1) [2]

(d) **(i)** current was too low/the voltage was too low/resistance was too high [1]

(ii) 11.5 × 1.55 = power in watts (1) = 17.8 W (1) (ecf) [2]

[Total: 10]

2 **(a)** **(i)** use the same volume (amount) of solution each time [1]

(ii) shake/stir/mix [1]

(iii) the mixture becomes colourless/colour changes [1]

(iv) solution **B** [1]

(b) fill the pipette more than once and deliver into the measuring cylinder/
place in the cylinder enough liquid to be measured OWTTE (1)
divide volume by the number of drops (1) [2]

(c) **(i)** white/cloudy/milky/(precipitate) [1]

(ii) (light) green (precipitate) [1]

(d) **(i)** iron(III) hydroxide/ferric hydroxide
(allow mark for correct formula $Fe(OH)_3$) [1]

(ii) iron(II) is oxidised/oxidation number increased/
changed to iron(III)/loses an electron [1]

[Total: 10]

3 **(a)** **(i)** correct path drawn showing three straight lines,
meeting at the boundaries of the glass block [1]

(ii) line at right angle to block where line **AB** meets glass [1]

(iii) **i** and **r** labelled correctly at change of direction of line
(even if diagram not correct) [1]

(iv) 30 degrees (1), 20 degrees (1) +/– 2 degrees
(give marks for any labelled angles correctly measured) [2]

(b) axes labelled and sensible scale chosen (1)
points correctly plotted (allow one error) (1)
smooth line drawn (1)
(–1 mark if axes reversed) [3]

(c) line or point shown on graph (1)
42° +/– 1 degree (depends on candidate's graph) (1) [2]

[Total: 10]

4 **(a)** **(i)** the black deposit is carbon (1)
not enough oxygen/air for complete combustion OWTTE (1) [2]

(ii) the centre of the flame contains gas that is not burning (1)
but the outside ring of the flame scorches the paper OWTTE (1) [2]

(b) **(i)** melts/liquefies [1]

(ii) decomposes [1]

(c) a glowing splint (1)
rekindles OWTTE (1) [2]

(d) there is enough air (oxygen) mixing with the butane for complete combustion/
to burn efficiently OWTTE (1)
so more heat (energy) is given out OWTTE (1) [2]

[Total: 10]

5 **(a)** **(i)** 5 s, 6 s (no tolerance) [1]

(ii) 2.5 s, 3 s (no tolerance) [1]

(b) **(i)** vertical line drawn at 2.5 s (may extend beyond diagonal) [1]

(ii) correct calculation, e.g. 2.5 × 25/2 (1)
= 31.25 m (1) (ecf) [2]
(allow 1 mark for a sensible attempt at finding area,
e.g. by counting or calculating the number of squares)

(iii) 3 × 30/2 (1) = 45 m (ecf) (1)
(allow 1 mark for counting or calculating the number of squares) [2]

(c) chemical; kinetic; (gravitational) potential; kinetic; sound; heat
5 or 6 correct (3) 3 or 4 (2) 1 or 2 (1) [3]

[Total: 10]

6 **(a)** sodium melted/formed into a ball/dissolved quicker/moved faster/
bubbled at a greater rate/small explosion at end/other sensible answer (any 2) [2]

(b) flame appeared/exploded/smoke
do not accept same answer as **(a)** [1]

(c) reaction vessel e.g. test-tube with delivery tube (1)
collection device e.g. over water, or syringe (1) [2]

(d) **(i)** sodium + water → sodium hydroxide (1) + hydrogen (1) [2]
accept correct symbol for either product

(ii) sodium hydroxide: e.g. add (named) indicator (1)
turns correct colour for named indicator (must match) (1)
OR completely correct chemical test for the presence of alkali,
e.g. reacts with ammonium salt to give ammonia which turns litmus blue

hydrogen: pops with lighted splint (1) [3]

[Total: 10]