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

0654 CO-ORDINATED SCIENCES

0654/06 Paper 6 (Alternative to Practical), maximum raw mark 60

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1 (a) (i) blue-black or chlorophyll area labelled in line **A** of Fig.1.3 [1]

(ii) blue/black or blue or black [1]

(b) mark all three lines together
leaf **A** light, carbon dioxide present;
chlorophyll present; [2]
leaf **B** carbon dioxide absent [1]
leaf **C** light absent [1]

(c) (i) as a control / same volume (amount) of water in all three tubes (1)

(ii) to soften the cuticle / break down cell walls / allow alcohol to penetrate (1) [2]

[Total: 8]

2 (a) 11.5 V +/- 0.1 V;
1.55 A +/- 0.05 A; [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 correct method used in parts **(ii)** and **(iii)** but calculation wrong, allow 1 mark total)

(c) the filament melted / fused OWTTE;
because the voltage was too high / resistance too low / current too great; [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;
= 17.8 W; (ecf) [2]

[Total: 10]

3 (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;
divide volume by the number of drops; [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]

4 (a) 67°, 75° (no tolerance) [2]

(b) all points plotted for beaker **A** (allow 2 errors);
smooth curve drawn and labelled **A**;
all points plotted for beaker **B** (allow 2 errors);
smooth curve drawn and labelled **B**;
(if no curve labelled, deduct only 1 mark) [4]

(c) (i) beaker **B**,
shows a greater drop in temperature OWTTE / the curve is steeper (both correct) [1]

(ii) heat conducted by the copper OWTTE (mention of conduction essential) [1]

(d) large area loses heat more quickly;
by radiation;
hot conditions in Africa;
helps control body temperature OWTTE;
(reject: elephants lose heat by flapping ears / shading body) [max 2]

(e) same starting temperature;
temperature taken at same time (periods);
same volume of water used;
same containers; [max 2]

[Total: 12]

5 **(a)** **(i)** correct path drawn showing three straight lines, meeting at boundaries of 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; 20; +/- 2
(give marks for any labelled angles correctly measured) [2]

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

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

[Total: 10]

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

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

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

(ii) decomposes [1]

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

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

[Total: 10]