UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

0654 CO-ORDINATED SCIENCES

0654/61 Paper 6 (Alternative to 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.

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1 **(a)** batch **A** mass 8.8 g ;
batch **B** mass 8.3 g ;

(b) average mass for batch **A** time 0 = 0.88
1 = 1.74
4 = 2.57
7 = 3.26
average mass for batch **B** time 0 = 0.83
1 = 1.68
4 = 3.22
7 = 4.20
(allow ecf) (all correct 2 marks, 1 error 1 mark) [2]

(c) scale correct ;
plotting of points for both batches correct ;
reasonable curve(s) drawn ;
(**if** a non-linear scale only curves can score) [3]

(d) **(i)** (seed / seedlings) took up / absorbed water ; [1]

(ii) seedlings will die ;
cannot photosynthesise / have used up stored energy ;
(ignore references to water) [2]

[Total: 10]

2 **(a)** **(i)** 1.55 ; 1.6(0) (no tolerance) ; (allow 1 mark if reversed) [2]

(ii) 1.55 × 0.25 = 0.39 (ecf) ;
1.6 × 0.12 = 0.19(2) (ecf) ; [2]

(iii) Watt(s) / W ; [1]

(b) **(i)** diagram shows 2 lamps in parallel ; [1]

(ii) 0.48 (+/– 0.01) ; [1]

(iii) 0.48 × 1.5 = 0.72 (allow 0.705 to 0.74) (ecf); [1]

(c) both statements are true / statement 1 is true and statement 2 is true but not as accurate ; [1]
(allow statement(s) is / are false if justified)

(d) clock / watch / timer ; [1]

[Total: 10]

3 **(a)** blue ;
ammonia ;
ammonium (accept NH_4) ;

(b) **(i)** iron(II) ;
iron(III) ; (allow 1 mark if oxidation state missing or reversed)
oxidation ; [3]

(ii) barium chloride (nitrate) ;
white precipitate / ppt. / solid / residue ; [2]

(iii) nitric ; (**must** score before award of next mark)
silver nitrate / lead nitrate ; [2]

[Total: 10]

4 **(a)** 23.2 °C ;
44.8 °C ; (no tolerance) [2]

(b) 95.8 g ;
97.9 g ; (no tolerance) [2]

(c) 97.9 – 95.8 = 2.1 g (ecf) ; [1]

(d) 44.8 – 23.2 = 21.6 °C (ecf) ; [1]

(e) **(i)** condensation / condensing ; [1]

(ii) molecules (particles) / gas lose energy / move more slowly / forms bonds ;
on changing from gas to liquid / owtte ;
(**not** molecules / particles come closer together)
(e.g. gas molecules lose energy when they become liquid = 2 marks) [2]

(f) some (2.1 g) water / steam cools (from 100 °C to 44.8 °C); [1]

[Total: 10]

5 **(a)** **C** and **E** purple ;
A, **B** and **D** blue ;

(b) **B** blue / black ;
C and **D** brown / yellow ; (ignore colours in other boxes) [2]

(c) tube **D** ;
(Benedict's solution) changes (from blue) to red / shows a positive test ; [2]

(d) put starch / solution **B** into two test-tubes ;
add protein solution to each / use **C** and **E** ;
allow to react / leave for some time ;
at a temperature of 35 °C (allow 30 °C to 40 °C) / warming ;
test-tubes with Benedict's solution ;
positive result with amylase ; [max 4]

[Total: 10]

6 **(a)** **(i)** (dark) red or red-brown (**do not** accept 'brown' on its own) ; [1]

(ii) black ; [1]

(b) litmus (turns red and then) is bleached / loses colour ; [1]

(c) **(i)** blue-black colour (accept 'blue' or 'black') ; [1]

(ii) $Cl_2 + 2KI \rightarrow 2KCl + I_2$
all formulae correct ;
balanced ; [2]

(d) **(i)** ethene ; [1]

(ii) unsaturated / (molecules) contain a double bond / C=C ; [1]

(e) **(i)** purple ; [1]

(ii) sublimation / subliming ; (ignore reverse) [1]

[Total: 10]