UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2011 question paper for the guidance of teachers

0654 CO-ORDINATED SCIENCES

0654/63 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)** **(i)** stomata / pores ;
expanding gas ,
air / oxygen / CO_2 ; [m

(ii) **C** – between 42 and 45 ;
P – between 20 and 24 ; [2]

(iii) total no. of squares for **C** e.g. 42 multiplied by 100 ;
total no. of squares for **P** e.g. 20 multiplied by 100 ; [2]

(iv) warmer ;
in direct sun ;
more wind movement ;
less humid ;
more water loss ;
more wilting ; [max 2]

(b) all bundles indicated by shading ;
xylem ; [2]

[Total: 10]

2 **(a)** **(i)** green ;
to yellow / orange ; [2]

(ii) carbonic acid ; (allow H_2CO_3) [1]

(b) **(i)** turns white / white precipitate / milky / cloudy / owtte ; [1]

(ii) white / milkiness disappears / owtte (reject dissolves / reacts) ; [1]

(iii) (aq) = aqueous / dissolved ;
(g) = gas / gaseous ;
(s) = solid ; [3]

(iv) precipitate ; [1]

(c) **B** and **C** ; [1]

[Total: 10]

3 **(a)** **(i)** 1.9 A ;
2.3 V (± 0.1) ;

(ii) 2.0 / 2.5 = 0.8 (e.c.f., accept answers with more decimal places) ;
2.3 / 1.9 = 1.2 ; [2]

(b) **(i)** sensible scales chosen, axes labelled ;
all points plotted ± small square (e.c.f.) ;
smooth curve drawn ; [3]

(ii) curve extended to show five wires ;
about 0.5 ohms (value from candidate's graph) ; [2]

(c) repeat (the experiment (using 1 wire – with different voltages and average (the results)) ; [1]

[Total: 10]

4 **(a)** **(i)** 45 ºC rate = 0.77 / min ;
55 ºC rate = 0.50 / min ; [2]

(b) **(i)** correct plotting ;
acceptable smooth curve drawn ; [2]

(ii) 50 ºC ; [1]

(iii) cannot tell exactly the rate either side of 50 ºC / owtte ; [1]

(c) **(i)** (rate speeds up due to) particles moving faster / more collisions ; [1]

(ii) protein denatures (due to high temperatures) ; [1]

(d) **tube 1** to check if acid is needed for the reaction ;
tube 2 to see if pepsin is needed / see if acid could do reaction ; [2]

[Total: 10]

5 **(a)** **(i)** water, ethanol, propanone or any suitable named organic solvent ; [1]

(ii) horizontal line drawn below the start line ; [1]

(iii) to prevent paper drying out / solvent evaporating / owtte ; [1]

(iv) any reasonable length of time, e.g. between 30 and 180 minutes ; [1]

(b) **(i)** both are mixtures / impure ;
one contains two dyes the other three ;
have one common dye ; [a

(ii) one is pure one a mixture / only 3 pure ;
one contains three dyes the other one ;
have no common dye ; [any 1]

(c) named acid ; [1]
named alkali (either order) ; [1]

cut spot from paper / use of spot ;
add acid or alkali to spot ;
look for colour change ; [max 2]

[Total: 10]

6 **(a)** 58 cm mark labelled **Y** ;
51 cm mark labelled **Z** ; [2]

(b) lines **YO** and **ZO** drawn (e.c.f.) ; (ruler straight) [1]

(c) **(i)** 66 mm (or as candidate's diagram) ; [1]

(ii) 63 mm (or as candidate's diagram) ; [1]

(iii) 87 mm (or as candidate's diagram) all ± 1 mm ; [1]

(d) **(i)** 87/66 = 1.3 (e.c.f) ; [1]

(ii) 87/63 = 1.4 (e.c.f) ; [1]

(e) **(i)** (below) because the fish is deeper / further away than he sees it / light is bent away from the normal as it leaves the surface / owtte ; [1]

(ii) his aim must be deeper than in fresh water, because the light is bent more / owtte ; [1]

[Total: 10]