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

0653 COMBINED SCIENCE

0653/63 Paper 6 (Alternative to Practical), maximum raw mark 60

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1 **(a)** **(i)** stomata / pores ;
expanding gas ,
air / oxygen / CO_2 ; [max 2]

(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) ; [2]

(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 ; [any 1]

(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]