CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

MARK SCHEME for the May/June 2014 series

0653 COMBINED SCIENCE

0653/52   Paper 5 (Practical), maximum raw mark 30

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) purple / pink **AND** due to pH above 8 / alkaline conditions ; [1]

(b) (i) row or column for **A** and **B** ;
row or column for recording time with suitable units (in heading or with each
reading) ; [2]

(ii) results recorded for both blocks (neither greater than 5400 s / 90 min) ;
block **B** has shorter time ; [2]

(c) acid diffuses (into agar) ;
pH is reduced / acid neutralizes alkali / it becomes neutral ; [max 1]

(d) different volumes of acid ;
use the same volume / amount ;
OR
difficult to judge the end point ;
(so) repeat and calculate a mean / time to whole block colourless ;
OR
difficult to cut blocks evenly / dimensions not accurate ;
(so) have a guide to help cutting / use moulds for **A** and **B** ;
(to award second mark the improvement must match a stated inaccuracy)
any pair [max 2]

(e) (i) reduction in distance for diffusion / **B** is a smaller block ;
increase in surface area to volume ratio ; [max 1]

(ii) different sized blocks / greater range of block sizes / another size of block ; [1]

[Total: 10]

2 (a) (i) blue / blue-green / green ; [1]

(ii) *observation :* no reaction (allow grey ppt) ;
conclusion : not chloride / not Cl^- ; [2]

(iii) *observation :* white ppt ;
conclusion : sulfate / SO_4^{2-} ; [2]

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(b) (i) brown ppt / brown solid / brown suspension / insoluble brown ;
(allow red-brown ppt) [1]

(ii) *colour of filtrate :* (dark) blue ;
colour of residue : brown / red-brown / black / green ; [2]

(iii) *cation in filtrate :* Cu^{2+} / copper   (not Cu) ;
cation in residue : Fe^{3+} / iron(III)
OR
cation in residue : Fe^{2+} / iron(II) if residue in **(b) (ii)** is green ; [2]

[Total: 10]

3 (a) (i) *I* value recorded ;
V value recorded ; [2]

(ii) A / amp(ere) ; [1]

(iii) *I* values all recorded ;
I values < 1 A and to at least two decimal places ;
V values all < 2.5 V and to at least one decimal place ;
V values decreasing down table ; [4]

(b) (i) all *P* values correct ;
values decreasing down Table 3.1 ; [2]

(ii) the lamp gets dimmer (as *l* increases) ; [1]

[Total: 10]