CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

0654 CO-ORDINATED SCIENCES

0654/52 Paper 5 (Practical), maximum raw mark 45

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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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CAMBRIDGE
International Examinations

1 (a) (i) barley grains drawn in both dishes ; [1]

(ii) drawings of both dishes ;
dish **A** shows brown / orange / yellow and blue / black areas labelled
AND
no brown in dish **B** ; [2]

(iii) brown / orange / yellow colour around where the barley grains were ;
(allow no starch where grains were) [1]

(iv) (enzyme from the) barley grains breaking down / digesting the starch ;
(allow area below grains no longer contains starch) [1]

(v) control / shows that breakdown depends on living barley grains; [1]

(b) (i) all four sections of the table filled in ;
first row shows Benedict's solution blue ; [2]

(ii) tube **B**: (reducing) sugar present / not present ; *(conclusion must match observation)*
because starch digested to sugar / sugar absorbed by seed / other good explanation ; *(reason must match conclusion)* [2]

tube **D**: (reducing) sugar not present ;
because seeds are dead / starch not digested ; [2]

(c) improved reliability / because one seed might not be active / owtte ; [1]

(d) (i) larger brown areas / less starch present ; [1]

(ii) smaller brown areas / more starch present ; [1]

[Total: 15]

2 (a) (i) reading for x when d = 55 cm to nearest mm ; [1]

(ii) note reading on either side of mass and find the mean value / measure mass and divide by 2 to find centre mark ; [1]

(iii) complete set of x values ;
x values increasing down the table ; [2]

(b) (i) axes labelled with units ;
suitable choice of scales (points use at least 8 cm × 8 cm of grid) ;
at least 4 points correct to half a small square ;
good best fit straight line judgement ; [4]

(ii) indication on graph of how data obtained
AND
at least half of line used ;
correct calculation from triangle method using data from graph (at least 2 significant figures) ; [2]

(c) correct calculation of m (from candidate's gradient value, to 2 / 3 significant figures)
AND
correct rounding required ; [1]

(d) (i) both values present, and realistic ;
both values to nearest millimetre ; [2]

(ii) correct calculation of density (from candidate's values and at least 2 significant figures) ;
accuracy mark: value within ± 0.1 of Supervisor's value ; [2]

[Total: 15]

3 **Table 3.1**

test	*observation*	*conclusion*
(a) (i) dilute nitric acid	no reaction / nothing / paler solution ;	no carbonate / no CO_3^{2-} ;
(ii) barium chloride solution	ppt of stated colour ;	sulfate / SO_4^{2-} ;
(iii) silver nitrate solution	white ppt ;	chloride / Cl^- ;

[6]

Table 3.2

test	*observation*	*conclusion*
(b) (i) sodium hydroxide solution	brown / orange / red-brown / yellow-brown **AND** ppt / residue ; colourless filtrate ;	iron(III) / Fe^{3+} ;
(ii) ammonia solution	brown / orange / red-brown / yellow-brown **AND** ppt residue ; <u>dark</u> blue filtrate ;	iron(III) / Fe^{3+} ; copper(II) / Cu^{2+} ;
(iii) sodium carbonate solution	brown ppt ;	

[8]

(c) iron(III) chloride **AND** copper(II) sulfate / iron(III) sulfate **AND** copper(II) chloride ;
(allow any three or all four compounds but not a list of the ions) [1]

[Total: 15]