**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**International General Certificate of Secondary Education**

# MARK SCHEME for the October/November 2013 series

# 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.

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

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**1 (a) (i)** blue-black ; [1]

**(ii)** starch (still) present ; [1]

**(iii)** *(for sugar accept glucose, maltose, etc.)*
rows 2 to 4 correct, i.e.
sugar absent,
starch absent,
sugar absent ;

rows 5 to 8 correct, i.e.
starch absent,
sugar present,
starch absent,
sugar present ; [2]

**(b) (i)** (breaks down / converts) <u>starch</u> to <u>sugar</u> ; [1]

**(ii)** sugar molecules can pass through ;
because molecules are small (enough to pass through) ;
sugar present in the water or the beaker ;
*(any two, ignore refs to diffusion)* [max 2]

**(c) (i)** <u>small</u> intestine *(allow duodenum, ilium)* ; [1]

**(ii)** blood / capillaries ; [1]

**(d)** because molecules are too big / so that it can be absorbed / diffused ; [1]

**[Total: 10]**

**2 (a) (i)** 67.8 ;
62.9 ; (no tolerance) [2]

**(ii)** 67.8 – 45 = 22.8 (ecf) ;
62.9 – 25 = 37.9 (ecf) ; [2]

**(iii)** 22.8/45 = 0.51 (ecf) ;
37.9/25 = 1.52 (ecf) ; [2]

**(b) (i)** points plotted ± 1 small square ; *(allow 1 error)*
best straight line drawn ; [2]

**(ii)** clear evidence shown on graph ;
14.5 – 15.5 (ecf) ; [2]

**[Total: 10]**

**3** **(a)** **(i)** limewater becomes cloudy / milky / white ppt / white solid forms ; [1]

**(ii)** carbon dioxide/$CO_2$ ; [1]

**(iii)** solid **X** is a (metal) carbonate or hydrogen carbonate (bicarbonate); [1]

**(b)** diagram shows filter funnel containing paper and collecting vessel ;
any two relevant labels ; [2]

**(c)** **(i)** copper(II) hydroxide (allow copper hydroxide) ; [1]

**(ii)** (dark) blue solution (both words necessary) ; [1]

**(d)** **(i)** (blue solution) becomes colourless / green (solution) ; [1]

**(ii)** (grey) filings become copper coloured / pink / brown / orange ; [1]

**(e)** copper(II) carbonate (allow copper carbonate) **AND** $CuCO_3$ (both correct) ; [1]

**[Total: 10]**

**4** **(a)** **(i)** diagram clearly drawn with sharp pencil ;
diagram roughly to scale ; [2]

**(ii)** In the range 52 mm to 57 mm ; [1]

**(iii)** answer according to students own diagram ; [1]

**(iv)** magnification correctly calculated from student's own data ; [1]

**(b)** **(i)** line correctly drawn through main part of root to make a transverse section ; [1]

**(ii)** one area of xylem correctly labelled (the cross) ; [1]

**(c)** cut seedling through stem ;
put in coloured liquid ;
and leave for a while ;
cut section through stem and view with microscope / hand lens ;
xylem will be coloured by the coloured liquid ; [max 3]

**[Total: 10]**

**5** **(a)** magnesium ;
silicon ; [2]

**(b)** phosphorus
sodium ; (must be in correct order) [1]

**(c)** (element number 17) (chlorine) is yellow / green / not colourless / is coloured ; [1]

**(d)** include the sample in an electrical circuit / try to make it conduct electricity ;
*observation:* bulb lights up / ammeter shows a reading ; [2]

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

**(ii)** to dissolve / make a solution ; [1]

**(iii)** red / pink / orange ; *(accept yellow)* [1]

**(iv)** blue / indigo / violet ; *(accept dark green)* [1]

**[Total: 10]**

**6** **(a)** 0.26 A ;
1.55 V ; [2]
0.30 A ;
1.80 V ; all 2dp, penalise once [2]

**(b)** **(i)** 1.55/0.26 = 6.0 (ecf) ;
1.80/0.30 = 6.0 (ecf) ; [2]

**(ii)** voltage is read to the nearest 0.05 V, giving a possibility of inaccuracy / the wire heats up ; [1]

**(iii)** find the average / plot a graph and find the gradient ; [1]

**(c)** **(i)** electrons ; [1]

**(ii)** arrow shown pointing from left to right on the resistance wire ; [1]

**[Total: 10]**